

Samady, Saif R.

## **Education and scientific training for sustainable development of Afghanistan**

*Kingston : PDC Copyright 2007, 112 S.*

urn:nbn:de:0111-opus-15078



### **Nutzungsbedingungen / conditions of use**

Gewährt wird ein nicht exklusives, nicht übertragbares, persönliches und beschränktes Recht auf Nutzung dieses Dokuments. Dieses Dokument ist ausschließlich für den persönlichen, nicht-kommerziellen Gebrauch bestimmt. Die Nutzung stellt keine Übertragung des Eigentumsrechts an diesem Dokument dar und gilt vorbehaltlich der folgenden Einschränkungen: Auf sämtlichen Kopien dieses Dokuments müssen alle Urheberrechtshinweise und sonstigen Hinweise auf gesetzlichen Schutz beibehalten werden. Sie dürfen dieses Dokument nicht in irgendeiner Weise abändern, noch dürfen Sie dieses Dokument für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, aufführen, vertreiben oder anderweitig nutzen.

We grant a non-exclusive, non-transferable, individual and limited right to using this document.

This document is solely intended for your personal, non-commercial use. Use of this document does not include any transfer of property rights and it is conditional to the following limitations: All of the copies of this documents must retain all copyright information and other information regarding legal protection. You are not allowed to alter this document in any way, to copy it for public or commercial purposes, to exhibit the document in public, to perform, distribute or otherwise use the document in public.

Mit der Verwendung dieses Dokuments erkennen Sie die Nutzungsbedingungen an.

By using this particular document, you accept the above-stated conditions of use.

### **Kontakt / Contact:**

**peDOCS**  
Deutsches Institut für Internationale Pädagogische Forschung (DIPF)  
Mitglied der Leibniz-Gemeinschaft  
Informationszentrum (IZ) Bildung  
Schloßstr. 29, D-60486 Frankfurt am Main  
E-Mail: [pedocs@dipf.de](mailto:pedocs@dipf.de)  
Internet: [www.pedocs.de](http://www.pedocs.de)

# **Education and Scientific Training**

**for**

# **Sustainable Development of Afghanistan**

**Saif R. Samady**

Kingston, 2007  
PDC Copyright





## **Author**

Saif R. Samady completed his primary and secondary education in Kabul, Afghanistan. He continued higher education in the USA and obtained a BSc in chemical engineering from the University of Illinois and a Ph.D. in chemistry from the University of Colorado. He was a Research Fellow at the University of Durham, United Kingdom in 1961.

Saif Samady was Associate Professor at the Faculty of Science, University of Kabul, and held the positions of President of the Department of Technical, Vocational and Teacher Education (1962-1967) and first Deputy Minister of Education (1969-1971) in the Afghan Ministry of Education.

For more than two decades he was a senior UNESCO official. He was Education Advisor at the UNESCO Regional Office for Education in Asia and the Pacific in Bangkok (1967-1968), Director of the UNRWA/UNESCO Department of Education in Beirut/Amman (1971-1976) and Director of the Division of Science, Technical and Environmental Education at UNESCO Headquarters in Paris (1977-1991). After retiring from UNESCO, he continued as an international education consultant.

Saif Samady was Chairman of the Independent High Commission of Education (2002-2003), established by the Government of Afghanistan.

Author's other relevant recent publications:

Education and Afghan Society in the twentieth century, UNESCO, 2001

Modern Education in Afghanistan, IBE (UNESCO), 2001

Working Knowledge: symbiosis of programmes in science teaching, environmental education, and technical and vocational education; Sixty Years of Science at UNESCO 1945-2005, published in 2006



## **Preface**

Education and training play an important role in the rehabilitation and development of Afghanistan. Since 2002 the government, with the assistance of the international community, has made efforts for the expansion of educational opportunities for Afghan children and young people. The National Development Strategy, adopted in 2006, envisages significant development of basic education, university studies and vocational training.

Educational development requires substantial resources. It is important to ensure the efficiency and relevance of the education operation. The Independent High Commission of Education, established by the Afghan government in 2002, recommended measures for the efficiency and quality of education including the establishment of appropriate infrastructure for training, research and development.

Education and scientific training will contribute to sustainable development. This document reviews and analyses the recent reflections and plans for the development of education in Afghanistan. The issues relevant to education and training for sustainable development, and relations between science, technology and economic growth are discussed. Suggestions are made for a national science and technology policy and preparation of a long-term strategic plan.

In this document I have attempted to make the case for quality education and capacity building in science and technology for sustainable development of Afghanistan. It is through education and scientific training that the Afghan people will develop their full potential to be able to participate effectively in social and economic activities, and contribute to sustainable growth and progress in the country.

Saif R. Samady

# Contents

<b>Introduction</b>	9
<b>I. The Evolving Afghan Education</b>	12
Governmental Policies	
Development of Education	
Partnership	
Future Perspective	
<b>II. Reflections on Educational Development</b>	33
Principles, Policies and Objectives	
Educational Governance	
General Education	
Teacher Education	
Technical and Vocational Education	
Higher Education	
Research and Development	
<b>III. National Development Strategy</b>	53
Development of Education (Programme objectives; Five-year Benchmark; Strategies; Priorities)	
Work Plans	



<b>IV. Education for Sustainable Development</b>	<b>65</b>
Definition	
International Consensus	
Decade of Education for Sustainable Development	
The Millennium Development Goals	
Sustainable development in Afghanistan	
<b>V. Science and Technology and Economic Growth</b>	<b>77</b>
Science and Development	
Science and Millennium Development Goals	
Science and Technology in Afghanistan	
National Capacity Building	
<b>VI. Science Policy for Afghanistan</b>	<b>91</b>
Objectives	
Elements of Strategies	
National Council for Science and Technology	
Selected Bibliographic Sources (Annex)	111

## **Introduction**

After more than two decades of conflict in Afghanistan and suffering of Afghan society, and much destruction, the country has begun a process of political reform and reconstruction, with the assistance of the international community. The task ahead is formidable. The Government National Development Strategy, which was adopted in 2006, includes institutional and human capacity building. Education, scientific training and skills development are essential for sustainable development.

In view of the disruption of Afghan education in the 1980s and 1990s, a national education system needs to be developed to provide basic education and training for millions of children and semi-literate or illiterate young people and adults. The education programmes should be based on the needs of Afghan society and prepare the young generation for the challenges of the twenty first century. Mobilizing national and international resources, developing modern curricula including science and technology and establishing infrastructure for education, training and research will accelerate the development of human resources and social and economic progress.

This document examines the background of Afghan education and recent measures taken to establish principles and a framework for development of education and training in the country. It underlines the significance of science and technology for sustainable development of Afghanistan. The document has six chapters. Chapter I considers the evolution of modern education in

Afghanistan, with periods of progress and set-backs, and the present situation. Chapter II is reflections on the revival and development of education in Afghanistan and is based on the report of the Independent High Commission for Education (2003), which the author had the honour to chair. Chapter III deals with education goals, priorities and programmes, envisaged in the National Development Strategy, prepared by the government and endorsed at a conference of donors (London, January 2006).

Chapters IV and V focus on the role of education and science in sustainable development of Afghanistan. Chapter IV discusses the changing concept of development and the importance of its social, cultural and environmental dimensions and international consensus on the need for sustainability. Reference is made to the United Nations Decade of Education for Sustainable Development. The issues of sustainable development in Afghanistan are considered and proposals made concerning education for sustainable development. Chapter V discusses the role of science and technology in economic growth, and the recommendations of the United Nations Task Force on Science, Technology and Innovation (2005) for achievement of the millennium development goals. The present situation of scientific institutions and technical and vocational training in Afghanistan are described, and suggestions made for strengthening education and training in science and technology for sustainable development.

In Chapter VI, the author proposes a science policy for Afghanistan. This chapter considers the objectives, policy guidelines and elements of a strategy for the application of science and technology for sustainable development of the country. The establishment of a National Council for Science and Technology and preparation of a strategic long-term plan for capacity building is recommended. An important element of the future strategy for development of science and technology in Afghanistan should be the strengthening of cooperation at regional and international levels with relevant scientific institutions and organizations.

This document is intended for national policy makers, researchers, international agencies, non-governmental organizations and donors interested in the development of education, science and human capital for sustainable development of Afghanistan.

# **The Evolving Afghan Education**

Afghanistan is a traditional multi-ethnic developing country. Educational development during much of the twentieth century reflected the traditional nature of the society. Modern education was developed in the 1950s and continued in the 1960s and 1970s. Unfortunately, Afghanistan experienced periods of conflict, especially during the last two decades of the twentieth century, which had a devastating effect on Afghan society, and its social and economic infrastructure, including education. The nature and form of education and its expansion have been influenced by the changing political context in the country and by the social and economic policies of successive regimes and governments, as well as by parents' aspirations for the education of their children. Experience has shown that, under conditions of peace and tranquillity and with appropriate education policies, a modern education system, with equal access and opportunities for all, could be developed in the context of national values and heritage. The evolution of modern education in Afghanistan, including government policies, the expansion of education, community participation and international cooperation and the future perspective are discussed in this chapter.

## **Governmental Policies**

The beginning of modern education (western style) in the country may be considered to correspond to the establishment of the first secondary school (Habibia) in Kabul in 1903. Following the independence of Afghanistan in 1919, during the reign of King Amanullah, social and political conditions became favourable for initiating the development of modern education in Afghanistan. The government gave high priority to the development of education and a Minister of Education was appointed for the first time in 1922. During the 1920s, a number of primary and secondary schools including a secondary school for girls and an adult education centre

for women, as well as several vocational schools, were established in Kabul. For the first time, a group of young Afghan boys and girls was sent to study in Turkish and European schools.

The 1920s was a progressive period for education. The King was keen to modernize the country through education and economic development. A number of European countries offered to assist Afghanistan in its social and economic development projects. France and Germany assisted with the development of secondary schools. However, the pace of modernization seemed to be too rapid for a conservative society. The independent Afghanistan was gaining political influence in the region, especially in the Indian sub-continent controlled by the British Government. As a consequence of opposition from conservative elements inside the country and external pressure, the King was forced to abdicate.

In January 1929 there was a set-back in the development of education due to the departure of King Ammanullah, followed by nine months of civil strife and anarchy during which modern schools were closed. Later that year Nader Shah became the king of Afghanistan, schools were reopened and attention was given to the development of education. In 1930 there were 1,590 students and 53 teachers in thirteen primary and secondary schools. In 1931 a new Constitution was promulgated in which (Articles 20 and 22) reference was made to compulsory primary education for Afghan children. The government was responsible for the development and supervision of all educational institutions except those carrying out traditional religious education. After the assassination of Nader Shah in 1933, and the beginning of the reign of Zaher Shah, there was limited expansion of education. From the early 1940s special attention was given to the development of Pashto as one of the two main national languages of Afghanistan.

The political priorities in the 1930s were the maintenance of internal security and the consolidation of the State, taking into account the tribal nature and ethnic diversity of Afghan society. Social and economic measures, including the education policy, aimed at

sustaining a traditional agricultural society. The majority of rural communities had no schools and continued the education of their children, in the traditional way, at home and in mosques. By 1940, with an estimated population of about ten million people, there were 60,000 pupils in 324 schools with 1,990 teachers throughout Afghanistan. A new Constitution was promulgated in 1948, in which primary education was made compulsory for every boy and girl, and the State reserved the right for development of education.

In the 1930s the development of education in Afghanistan was limited for a number of reasons. Based on the experience and lessons of the 1920s, there was a slowing down of the modernization programmes including educational development. Despite the provision in the Constitution for compulsory education, the expansion of modern education in the 1930s and 1940s was very limited, especially outside the main cities. The government policy did not envisage any significant development of education. The education of children mainly took place at home and in mosques. There was strong resistance against the education of girls in some parts of the country, particularly in the South. Social and economic progress in the country was hindered during the Second World War (1939-1944), due to restrictions in international trade and technical cooperation.

In 1964 a new Constitution was adopted in Afghanistan, which provided some measure of democratic reform within a constitutional monarchy. According to Article 35 of this Constitution, education is the right of every Afghan citizen. Education is free and the government is responsible for the supervision and guidance of educational activities. It is the aim of the government to reach a stage in which suitable educational facilities will be available for all individuals according to their capacity in institutions of primary education, literacy centres and institutions of vocational, secondary and higher education as well as centres for research and cultural activities. A new education law and a law for the development of higher education were enacted. Attention was given to the

development of education at all levels, particularly at secondary, vocational and higher education.

In 1973, Mohammed Daoud, a cousin of the King, overthrew the monarchy, with the help of leftist parties, and the Republic of Afghanistan was proclaimed. A new Constitution was promulgated in 1976, whose fundamental objective concerning education (Article 10) was stated as follows: provision of public compulsory primary education; development of free general secondary, vocational and higher education for the training of scientific and technical personnel, with the aim of serving the people. Special attention was given to the development of technical and vocational education including agricultural education. Despite economic limitations and technical constraints, successive governments in the 1960s and 1970s gave high priority (about ten per cent of the national budget) to the development of education.

The period of 1950-1978 witnessed steady progress in educational development. Government policy, led by a new generation of leaders including a number of Afghan technocrats and specialists, promoted social and economic development planning. The international community including the United Nations system provided technical and financial assistance to Afghanistan. The democratic movement during the 1960s created increased awareness for political and social reform in the country. The public demanded more and better education for their children, boys and girls. There was significant development of higher education and teacher training. The education system was diversified, and a number of innovative projects, involving international cooperation in the field of teacher education, technical and vocational education and higher education, were initiated.

The Republic of Afghanistan was overthrown in 1978 by two Afghan communist parties, and the Democratic Republic of Afghanistan was proclaimed. The new government had a political agenda for the transformation of Afghan society. Education was considered an important instrument for contributing to the social and



political changes envisaged in the country. The 'Fundamental Principles of the Democratic Republic of Afghanistan', adopted in 1980, clearly reflected the government's policy on education, which included literacy programmes, the expansion of basic education and the development of vocational training and higher education. The promotion of ethnic minority tongues as media of instruction was declared a priority. The education structure and programmes were adapted to be closer to the Soviet education system. The secondary and higher education system were reorganized. Three new universities in Balkh, Herat and Kandahar were established.

The 1980s reflected the political and ideological struggle in Afghanistan, and the opposition of the majority of the people against foreign domination. As a consequence of the war and exodus of people, the education system in the countryside, outside Kabul and main town centres, was seriously damaged. The higher education institutions were deprived of their best academics and professionals, who left the country. Despite efforts for modernization and educational reform and training of thousands of Afghan students in the USSR, the normal conditions for social and economic progress did not exist. Afghanistan did not have a unified national education system. The Afghan people inside the country and outside, as refugees, suffered. The non-governmental organizations and resistance groups supported basic education in the rural areas and for Afghan refugees outside the country.

With the formation of the Islamic State of Afghanistan in 1992, the first priority was the establishment of security and consolidation of government institutions. The government had the intention of building a national education system, based on the religious, cultural and historical traditions of Afghan society. Attention was given to the development of basic education for children and young people in primary schools and community centres, and teacher training. While there was no unified national curriculum, religious education constituted an important part of education. As a result of ethnic fighting throughout much of the 1990s, schools and educational institutions in the urban centres were also damaged. The government

lacked the necessary technical and financial resources for the enormous task of rehabilitation and development of the education system.

The 1990s, especially the period beginning with the establishment of the Mujahideen government in 1992, brought a glimmer of hope for peace and reconstruction. Unfortunately the rivalries among leaders and ethnic conflict and the arrival of the Taliban and their foreign supporters dashed the hope of the Afghan people for tranquillity or social and economic progress. As a result of ethnic struggle and fighting, the educational institutions in the cities were paralysed. Regional factions and commanders governed the country. The education of girls suffered especially after 1995. Without national planning or adequate facilities and academic staff, the local and regional authorities set up a number of post-secondary and higher education institutions. During the 1990s over 900 religious schools (madrasa) and several new Faculties of Islamic Studies were also established in the country.

The development of girls' education in Afghan society has been slow. The first girls' school was established in Kabul in 1932. Ten years later (1941), the first provincial girls' school was established in Kandahar. In 1940, female school enrolment in the country was 900. In 1950, there were 90,640 boys and only 4,350 girls (five per cent) in primary and secondary schools. By 1970, there were 92,500 female students in 231 village schools, 166 primary schools, 46 middle schools and 16 lycees throughout the country. An additional 1,860 female students were enrolled in vocational education, teacher training and higher education institutions. The enrolment of girls constituted fourteen per cent of the school enrolment in the country. As part of a modernization process, initiated by the government in 1958, measures were taken to facilitate the participation of women in the social, economic and cultural life of Afghan society. The promotion of girls' education continued through out the 1970s and 1980s. The government policy in the 1990s towards education of girls and women was restrictive, especially between 1995 and 2001, when the Taliban closed girls' schools in areas under their control.

Following the tragic event of September 2001 in the United States and subsequent removal of the Taliban regime, Afghanistan has been moving toward political, social and economic reform. With the assistance of the international community, efforts are made to stabilize the country and initiate social and economic development. The government's priority programmes include the provision of education. According to government reports, in 2005 over 5 million children and young people including a significant portion of girls were in the education system. However, the rapid expansion of education without sufficient teachers and adequate teaching materials is a challenge for the education authorities. The main concern now is the quality and relevance of education. The country needs thousands of trained teachers, textbooks, schools and other facilities to ensure the adequate development of education. This requires substantial technical and financial resources, appropriate strategies and trained cadres for management of the education system.

## **Development of Education**

### **Primary Education**

Modern primary education in Afghanistan did not develop until the beginning of five-year education development plans in 1956. In 1975 there were 789,000 boys and girls (thirty per cent) in primary education, which represented twenty-five per cent of the compulsory school age population. Two subsequent decades of conflict served only to exacerbate the situation. By the end of the century in 1999 there were 875,000 students including 64,000 females in 3100 schools and education centres through out the country. The average enrolment was 29.4 % (52.6 % for boys and 4.5 % for girls) for an estimated population of 25 million people. The government's campaign of 'back to school' in 2002 generated enormous interest and over two million children including 30 % girls enrolled in primary education.

Major steps to reform the schools curricula in Afghanistan were taken in the 1960s and 1970s. However, because of the conflicts, which then erupted and continued for two decades, education fell into a decline and millions of people became refugees. Diverse and uncoordinated efforts were made to maintain education services, both inside and outside the country, with the result that the teaching lacked most of its Afghan national features. Refugee camps and schools in neighbouring countries where children were taught, to which millions had fled, used their own curricula for teaching which contained little reference to Afghan history and culture, and made it difficult for children to obtain a sense of their own national identity from the teaching they were given. Since 2002 the Ministry of Education has initiated a curriculum development project in line with national goals and objectives.

## Secondary Education

In 1950, there were about 3,000 students in seventeen secondary schools (lycees) including four secondary schools for girls in Afghanistan. In 1970 there were 133 secondary schools with a total enrolment of 25,910 male and female students in grades ten to twelve. There was a relatively significant expansion of secondary education in the 1960s. In order to ensure a balanced development of secondary education, a number of boarding schools were established. In the 1960s, there was considerable public demand for the expansion of education, particularly at the secondary level. Secondary schools in the main cities had better teaching staff and physical facilities. Thus the quality of secondary education in the country was uneven, and the institutions of higher education had to take the situation into account in their admission policies.

The organization and curriculum of general secondary education followed a western style secondary school pattern, adapted to the cultural needs of Afghan students. In addition to the national languages (Pashto and Dari), a foreign language, mainly English and also French and German, was taught in secondary schools. Attention was given to the teaching of science and mathematics; there was a

shortage of qualified teachers for science subjects; in 1970 a national centre for science education was established. The expansion of secondary education continued during the 1970s and 1980s. The enrolment of general secondary education in 1990 was 182,340 students. At the end of the century (2000), there were 362,415 students in 590 middle schools (grades 7-9) and 426 secondary schools (grades 10-12); enrolment in 2002 reached 525,530 students including about 23 % female students.

### Technical and Vocational Education

Modern vocational schools in Afghanistan were developed after the Second World War. In 1950 there were 1,880 students in the Ministry of Education vocational schools. In 1975, enrolment in vocational schools was 6,000 students including 650 girls. Most vocational schools made provision for day students as well as residential facilities for boarding students. In addition to technical and vocational education and training programmes of the Ministry of Education, a number of other ministries and agencies were involved in the training of their technical personnel through specialized schools, or in-service and apprenticeship type training schemes. The Afghan Women's Institute offered vocational training for adult women. Technical and vocational education in Afghanistan was developed with external bilateral and multilateral technical assistance.

In modern times fine arts were promoted by The School of Fine Arts, which was established in Kabul in 1923, and which focused initially on painting and sculpture, and the training of art teachers. In the 1960s the programme and facilities of the school in Kabul were further expanded, and the arts section was primarily responsible for the training of the teachers of art in secondary schools. In 1975 a Department of Fine Arts was established in the University of Kabul, which initially offered courses in drawing and sculpture, and later added music, theatre, design, fine arts education, etc. Unfortunately the Department suffered in the 1980s due to the war and departure of Afghan professors. The Department was revived again in 2004.

In 1990 enrolment in vocational schools was approximately 13,000. In recent years, technical and vocational schools were largely damaged or destroyed, and were unable to function, since they lacked adequate physical facilities, teachers, workshops, equipment, textbooks and teaching materials. In 2004, there were 4,877 trainees in 41 technical and vocational institutions in Afghanistan, run by the Ministry of Education and other government departments. There were 24 institutions in Kabul and 17 in the provinces, and they provided training in the following areas: technical (18 in Kabul and 7 in the provinces), agricultural (1 in Kabul and 10 in the provinces), business administration (5 in Kabul). There are 9 post-secondary technical schools, 31 secondary vocational schools and one middle level school (grades 7 to 9). The government has initiated the rehabilitation of technical and vocational schools. Efforts have also been made to expand non-formal vocational training and skills development.

### Teacher Education

The first teacher training school was set up in Kabul (1923), in which about one hundred young men with the equivalent of primary education were admitted. They graduated four years later as teachers. The school gradually developed in terms of programme and facilities and trained the required teachers. In 1939 a new building with a capacity of one thousand students was constructed in Kabul for the basic teacher training school. With the beginning of the expansion of education in the early 1950s, special attention was given to teacher education as an important pre-requisite for the development of education in the country.

In 1956, in addition to improvements in the Kabul teacher training school, three new teacher training schools were established in the provinces (Herat, Kandahar and Nangarhar). The Institute of Education, which was established in 1955, provided professional support for teacher training programmes. In 1962 the Faculty of Education was established at the University of Kabul. In the mid-

1960s, the national teacher education system was reinforced in terms of new structures and programmes through the establishment of the Academy for Teacher Educators and the Higher Teachers' College. Secondary school teachers were trained at the University. Efforts were made for in-service training of teachers in summer and winter courses and also through distance education. In 1990, 6245 students were being trained in 18 teacher-training institutions for primary and secondary schools. In 1994/95 a total of 5300 male and female students were being trained in twelve teacher-training colleges.

The biggest challenge for expansion of education in the country is the preparation of teachers. The number of teachers in primary and secondary schools increased from 29,551 in 2000 to 78,130 in 2002. The majority of teachers are untrained in the education system. The provision of universal compulsory education requires a very large number of teachers during the next decade (the number of teachers required in 2015 is estimated to be 358,000). The government has established a University of Teacher Education. There are 6 Faculties of Education, 9 Faculties of Languages and Literature, 9 Faculties of Science and a number of other Faculties that will contribute to teacher training, in addition to teacher training colleges. These institutions require trained faculty and facilities for teacher training. The Ministry of Education intends to establish teacher-training colleges in all the provinces and further develop distance education.

## Higher Education

Modern higher education in Afghanistan began with the establishment of the Faculty of Medicine in 1932, followed by the Faculty of Law (1938), the Faculty of Science (1942), and the Faculty of Letters (1944). These Faculties were the basis of the University of Kabul when it was established in 1946. With the launching of the first five-year economic development plan in 1956, attention was given to the development of higher education. New buildings were constructed in Ali Abad for several Faculties and the administration of the University of Kabul as well as residential facilities and a central library. In 1968 the Constitution of

Universities was enacted, and as stated in Article 1, the principle objectives of the University are the preservation, dissemination and advancement of knowledge; strengthening personal and social responsibility in youth; and training youth to realize Islamic, national, legal and political values in order to serve Afghan society and mankind.

The development of higher education continued during the 1960s and 1970s. The enrolment in higher education was 1,700 including 157 female students in 1960; it increased to 12,260 in 1975, which included 1,680 female students; enrolment at the University of Kabul was 8,680. In 1975, there were 1,100 academic staff members in higher education, including sixty-four female teachers. The medical school later evolved into the large Medical Institute, consisting of four colleges which enrolled 4,613 male and 750 female students, taught by 154 men and 19 women instructors. In addition to national efforts, bilateral technical cooperation with a number of countries such as France, Germany, the USA and the USSR contributed to the development of higher education in Afghanistan.

A number of institutions of higher education were established in the 1990s by local and regional authorities to satisfy the demands of secondary school graduates and the local public. However most of the institutions of higher education lacked qualified staff and the necessary facilities such as libraries, laboratories etc. Furthermore, due to the ethnic conflict and fighting the universities were often closed and did not function effectively. Since 2002 efforts have been made to rehabilitate the institutions. In 2003, a total of 31,203 students including 5,963 female students attended 17 Institutes of higher education; there are 1,846 faculty members including 222 females. However, about 45 % of the faculty members have Master's degrees or higher and the remaining possess BA or BSc degrees. With the assistance of the international community, the Ministry of Higher Education has initiated a comprehensive programme of staff development, rehabilitation and reconstruction



of buildings and provision of laboratories, libraries, new technology etc.

The Ministry of Higher Education has also started the reorganization and development of universities and post-secondary institutions in the country. The plan envisages the consolidation and development of five regional universities (Kabul, Kandahar, Herat, Balkh and Nangarhar), 13 other universities and institutes of higher learning and a number of 2-year community colleges. The curricula of the institutions of higher education will be modernized and made relevant to the reconstruction and development needs of Afghanistan. Increased attention will be given to the subjects such as agriculture, health, engineering, science and technology, the environment, business and management etc.

In 2003, 92 Faculties provided higher education on the following subjects: Agriculture (8), Veterinary (2), Medicine (9), Pharmacy (1), Science/geology (12), Engineering (9), Economics (5), Law/Political Science (6), Literature (11), Fine Arts (2), Social Science (10), Theology (7), and Education (10). In 2005, a total of 36,786 students including 7,990 female students were enrolled in the institutions of higher education. It is expected that the enrolment in higher education will reach 100,000 by 2010. According to the provision of the new Constitution of Afghanistan, the government envisages the establishment of private universities and colleges of higher education. The first private university, the American University of Afghanistan, opened in Kabul in 2006. The major focus of this University will be management and new technology.

## **Partnership**

### **Bilateral Cooperation**

In the context of bilateral economic and cultural cooperation, the Afghan education system received assistance from many countries in the form of advisory services, technical and financial support and

fellowships. In terms of the impact on orientation and development of modern education in Afghanistan, cooperation with Turkey, France, Germany, the USA and the USSR was significant. Turkey had a historical role in the initial development of medical education in Afghanistan. France and Germany were involved from the 1920s in secondary education and during 1960s in the development of higher education. Germany also assisted in the development of mechanical and crafts schools and an institute of industrial management. The USA cooperated with the Ministry of Education and the University of Kabul between 1954 and 1978 in curriculum development, the teaching of English, teacher education, technical, agricultural and engineering education. The USSR assisted in the development of a Polytechnic and a number of technical schools (1960s).

To develop higher education especially in the fields such as medicine, science, engineering, agriculture, economics, law and teacher education, in the 1960s and 1970s the University of Kabul established affiliation with selected universities in France, Germany and the United States. These bilateral arrangements contributed significantly to development of the Afghan Institutions through modernization of the curriculum, exchange of academic staff members, joint research projects, training of Afghan counterparts and provision of laboratory and workshop equipment. With the current expansion of higher education in Afghanistan, and the need not only to rehabilitate and develop the institutions but also to keep them up to date, cooperative arrangement with appropriate institutions of higher education in the region and beyond will be an effective way to ensure the quality of the system.

The training of Afghan students abroad played an important role in the modernization and development of Afghanistan. A small number of Afghan students who were sent to Western Universities in the 1920s and 1930s played a catalytic role in the social, economic and political reform of the country. During the period 1950 - 1980 many hundreds of Afghan students including a small number of female teachers were trained as specialists at Universities in Europe, the

USA, the USSR and other countries such as Egypt and India. These specialists contributed to development of Afghanistan. A number of them held positions of responsibility in the Ministry of Education and higher education institutions. They played a significant role in the development of modern education. There is no doubt that international cooperation in the training of Afghan cadres abroad contributed to social and economic progress in the country.

### Multilateral Cooperation

International cooperation has for more than fifty years accompanied the development of the Afghan education sector. Afghanistan has been a member of the United Nations since 1946. UNESCO was created in 1946 and Afghanistan joined it one year later. In the 1960s and 1970s a number of educational projects, particularly in primary and basic education, teacher training and educational planning were developed with the technical assistance of UNESCO, UNICEF and UNDP. In the 1990s, UNESCO assisted in the establishment of a number of basic education centres in rural areas with the support of the communities concerned. A number of international organizations provided technical and financial resources for the education of Afghan refugees in neighbouring countries. Since 2002 the United Nations system and other international organizations including the European Community, the World Bank and the Asian Development Bank have made significant contributions to the rehabilitation and development of education in the country. In the present situation, multilateral organizations with the support of donor members can be a major source of technical and financial assistance for the modernization and development of the education system in Afghanistan.

### Non-governmental Organizations

Non-governmental organizations (NGOs) were mobilized during the 1980s to support the basic education of Afghan children, especially in the countryside, and in refugee camps outside the country. According to official reports, in 1988-91 NGOs were supporting

1,844 schools (out of a total of 2,433 schools) in twenty-nine provinces inside Afghanistan. In a document prepared by UNESCO in 2000, it was reported that thirty-four NGOs/Agencies were supporting 1,264 primary schools and basic education centres in about twenty provinces in Afghanistan. In 1999/2000, these schools employed 1,070 teachers and provided education for 112,115 children including 21,314 girls. The agencies and organizations conducted a wide variety of educational programmes, both formal as well as non-formal. They were providing support for the education of girls in formal schools and home schools, particularly after 1995, when the girls' schools were closed in some parts of the country.

Since 2002, most of the NGOs moved inside the country to assist with the rehabilitation of refugees and participate in a variety of social and economic projects including education. There were over 2000 local, national and international NGOs involved in development projects through out the county. There were reports that some NGOs were not operating efficiently and resources donated by people in various countries to help Afghanistan did not reach the intended beneficiaries. The government reviewed the regulations to rectify the situation. The NGOs in general offer a major source of technical and financial support for the development of basic education, skills training and construction of schools, particularly in rural areas. With appropriate regulations, and in cooperation with the education authorities and communities, the NGOs can make a significant contribution to the development of education and training in the country.

### Community Participation

The Afghan people cherish knowledge and respect scholars, teachers and educated individuals. Sending children to mosques to study the Quran and learn reading and writing was a common mode of education in Afghan society. Despite economic constraints and poverty people were keen to support the education of their children. With the development of schools, generally they began to recognize the value of modern education. In the 1960s people participated in

the construction of community schools. In many rural areas, the communities helped the teacher with accommodation. During the years of conflict in the 1980s and 1990s, communities cooperated with non-governmental organizations to ensure the education of their children. With increasing empowerment of communities in the social and economic sector, the potential of local communities should be exploited in the development of education in Afghanistan. This is particularly important in the present circumstances of limited resources and insufficient managerial capacity in the local and regional administration.

## **Future Perspective**

### Legal Framework

The new Constitution of Afghanistan, which was adopted in 2004, stipulates that nine years of basic education (primary and middle school) will be compulsory for all Afghan children between the ages of six and fifteen years old. Secondary, technical and vocational and higher education will also be expanded. Education in State schools and institutions will be free up to university level. The specific provision of Articles 43-47 of the Constitution is presented in the following paragraphs.

### Article Forty-Three

Education is the right of all citizens of Afghanistan, which shall be provided up to university level, free of charge by the State. The State is obliged to devise and implement effective programmes for a balanced expansion of education all over Afghanistan, and to provide compulsory intermediate level education. The State is also required to provide the opportunity to teach native languages in the areas where they are spoken.

#### Article Forty-Four

The State shall devise and implement effective programmes for the balancing and promoting of education for women, improving of education of nomads and elimination of illiteracy in the country.

#### Article Forty-Five

The State shall devise and implement a unified educational curriculum based on the provisions of the sacred religion of Islam, national culture, and in accordance with academic principles, and develop the curriculum of religious subjects on the basis of the Islamic sects existing in Afghanistan.

#### Article Forty-Six

Establishing and operating of higher, general and vocational education are the duties of the State. The citizens of Afghanistan also can establish higher, general, and vocational private educational institutions and literacy courses with the permission of the State. The State can also permit foreign persons to set up higher, general and vocational educational private institutes in accordance with the law. The conditions for admission to State higher education institutions and other related matters to be regulated by the law.

#### Article Forty-Seven

The State shall devise effective programmes for the promotion of science, culture, literature and the arts. The State guarantees the rights of authors, inventors, and discoverers, and encourages and supports scientific research in all areas, and publicizes the effective use of their results in accordance with the law.

#### National Development Strategy

The Government of Afghanistan in consultation with the international community adopted a National Development Strategy

in 2006. The Strategy focuses on security, governance, economic growth and poverty reduction (relevant elements of the National Strategy are presented in subsequent chapters). The government's vision, as stated in the National Development Strategy Document, is the following:

“Our vision for the Islamic Republic of Afghanistan is to consolidate peace and stability through just, democratic processes and institutions, and to reduce poverty and achieve prosperity through broad based and equitable economic growth.”

The government's goal, in the education sector, is to significantly improve the quality of, and promote equitable access to, education, skills development and other social services in order to re-invigorate Afghanistan's human capital, reduce poverty and facilitate economic growth. The objectives in educational development will be to expand access to primary and secondary education; build a system of higher education that responds to development needs of the country; and develop an effective skills development system. By the end of 2010 in line with development goals, net enrolment in primary school for girls and boys will be at least 60% and 75% respectively; enrolment of students in universities will be 100,000, with at least 35% female students; and 150,000 men and women will be trained in marketable skills.

## **The Challenges Ahead**

The strategy for development of the education sector is based on the context and conditions of Afghan society and the possibility of expansion and improvements of the national education system, taking into account the availability of technical and financial resources and the time required to implement the strategy effectively. The priority given to universal primary education and basic education corresponds to the constitutional rights of Afghan children and development needs of the country. The modernization and development of higher education and the expansion of

vocational training will contribute to social and economic development and achievement of the millennium development goals. Assuming the resources will become available, how will these strategies be implemented efficiently? What are the prerequisites for ensuring the quality of education and training?

I believe there are a number of measures and actions that are critical for effective implementation of the education strategy. These are the following:

- (1) Training of key managers at central and provincial levels of education; they are senior officials in the Ministry of Education and Ministry of Higher Education and provincial offices of education; heads of higher education institutions and teacher training colleges.
- (2) Infrastructure for development of curricula, methods and learning materials for primary, secondary and adult education, and printing facilities.
- (3) Extensive use of distance learning through the media, short courses and new technologies, especially for teacher training programmes.
- (4) Establishing a national centre for development of programmes and learning materials, and training of instructors for formal and non-formal vocational education and training.
- (5) Setting up of mechanisms for the involvement of communities and the private sector in the development of education and training projects; organization of inter-sectorial committees (education, agriculture, health, industry, rural development etc.) for education and training in the provinces.



- (6) Staff development and modernization of higher education, especially in science, technology and management, and effective interaction and cooperation between the institutions of higher education and social and economic projects.
- (7) Decentralization and devolution of responsibility to provincial and district levels for the development of basic education and skills training.
- (8) Development of technical and managerial capacity for construction of schools and training centres and provision of necessary educational equipment.
- (9) Measures for mobilization of resources for education and training including the participation of enterprises, professional organizations and associations, local community leaders, institutions and projects and Afghan entrepreneurs and specialists outside the country.
- (10) Monitoring and evaluation of educational development at national, provincial and district levels.

## **Reflections on Educational Development**

In order to consider the revival and development of education in Afghanistan, the government established in 2002 the Independent High Commission for Education. The Commission completed its final report in August 2003, which contained recommendations concerning national policy, objectives and strategies for modernization and development of the education system. The education of girls and women and promotion of education for peace and human rights were emphasized. The Commission also made specific proposals concerning future education policy and objectives for the new Constitution of Afghanistan. The reflections and recommendations of the Commission could be an important reference for future development of education in the country. The salient aspects of the deliberation of the Commission are presented in this chapter.

### **Principles, Policies and Objectives**

#### **The Guiding Principles**

The development of education in Afghanistan today should be based on the following guiding principles:

Islam; Afghan history, culture and arts; Social, economic and political reform; The alleviation of poverty and sustainable development; The application of science and technology to development; Globalization and modernization; International understanding; The development of the potential of the Afghan people, both men and women; Adaptability to change; The promotion of human rights; Multi-ethnic comprehension and a culture of peace.

Islam provides the spiritual, philosophical and cultural background for the Afghan people. The Islamic tradition permeates every aspect of Afghan Society and way of life, and is an important consideration for education. Islamic principles provide the ethical and moral values of the people. They promote fraternity and tolerance and are a unifying force in society.

Afghan history, culture, values and way of life are important elements of education, and should be incorporated in educational objectives. Afghan children and young people should learn about their history, literature and arts. The Afghan traditions of honour, pride and self-respect, ambition and hard work, family values, hospitality, friendship and generosity, etc., should be taken into account in the framing of educational objectives. The rich cultural values and ethnic diversity of the Afghan people should be reflected in its education.

Social structures influence the pace of development in Afghanistan. The conflicts of the last two decades of the twentieth century transformed Afghan society. Education can play an important part in contributing to social progress and development. It can train people for jobs, help to improve productivity, stimulate creativity, and train the manpower required for agriculture, industry, business, and the service sector. It will be through quality education, training and employment that young people will be reintegrated into society.

Afghanistan is in the process of political reform. The new Constitution ensures Afghanistan's territorial integrity; it has established national goals and aspirations, and the framework for a democratic government, with the appropriate political and administrative structures. Education for understanding democracy and its structures is crucial for the future good governance of Afghanistan. The importance of respect for the rule of law and order, security, and peaceful means of resolving conflicts, should be reflected in the educational objectives.

The role of education in alleviating poverty, and preserving a healthy environment and promoting sustainable development, is of paramount importance. Formal and non-formal agricultural programs will help to revitalize farming and increase food production. Human resources development is crucial for social and economic progress.

Science and technology play an important part in social and economic development. The twenty-first century will be one of increased knowledge, information, communication and economic cooperation. Technological innovations will have to be adapted to meet the needs of different societies. The application of science and technology to agriculture and industrial development will accelerate economic growth and progress. It is important that educational objectives reflect fully the requirements of modern life, and the need for adjustment to global and regional changes in trade, communications and technology.

International understanding, mutual respect and cooperation among peoples and countries, have become increasingly important for peace, security and development. It is important to respect the diversity of peoples, and try to understand them. Education should promote international understanding and respect among nations.

Ethnic diversity is an important consideration in the future development of education in Afghanistan. The Afghan nation is made up of Pashtuns, Tajiks, Hazaras, Uzbeks, Turkmen, Baluchis, Pachais, Aymaks, Nuristanis and other groups. Education should help to foster mutual understanding among people of different backgrounds, and emphasize their common interest in peace, and the need for cooperation in order to develop a prosperous and democratic society.

### Education Policies

Education policies should be formulated in line with the overall objectives and principles of education, and focus on the following:

The right to education; Education for all; The training of manpower; The eradication of illiteracy; A unified national curriculum; The education of girls and women; Language teaching; The mobilization of resources; The balanced development of education; Private education; Community participation; Decentralization and local governance; Monitoring and evaluation.

Education is the right of every Afghan citizen, and should be provided free in public schools and educational institutions. Measures should be taken to make nine years of schooling compulsory for all children, boys and girls, between the ages of seven and fifteen. The principle of providing equal access to education should be applied without any consideration of sex, race, religion, and social or economic status. 'Education for All' should be the cornerstone of education policy in Afghanistan.

The social and economic development of Afghanistan needs trained manpower, which depends on the development of secondary, technical and vocational and higher education. Hence suitable facilities should be provided for these education services, and made accessible to all individuals, according to their interests and abilities.

A national plan for the eradication of illiteracy and adult education and training, for men and women, should be prepared.

A unified national curriculum should be developed, based on the overall objectives of education and training.

The development of education for girls and women in Afghanistan must be given high priority.

With regard to language teaching, in the 1940s the Afghan education system adopted a sound and practical arrangement for the use of Pashto and Dari as the media of instruction in schools. Efforts should be made to introduce the teaching of minority mother tongues in primary education in the areas where the majority of the people speak them.

The development of modern education in Afghanistan was disrupted during the last two decades of the twentieth century, due to war and conflicts within the country. The country needs to make a great effort by mobilizing all resources for the development of education.

Future education policy and plans should emphasize the balanced development of education, with special attention paid to the needs of underdeveloped areas, minorities and marginalized groups.

It is important to involve also communities, organizations and individuals, in the development of education. Future education policies should consider decentralization and local governance. A participatory and accountable system of educational management needs to be developed. Monitoring and evaluation should be an integral part of the education system.

### The Objectives

The principal objective is to provide education for all, without discrimination with regard to sex, age, language, religion, ethnic or social group or place of residence, in a democratic and learning society. Formal primary and middle school education should be available and compulsory for all Afghan children aged 7 to 15.

The main purpose of education is to develop the physical, mental and spiritual capabilities of all Afghans, to consolidate their patriotic and humanistic feelings, and create in them an awareness of their obligations and responsibilities for ensuring national, social and economic progress. Learning programmes should teach the young and adults about human rights and democracy, the need for equality for men and women, the importance of unity and fraternity in Afghan society, and the need to respect both national and universal goals.

The expansion of educational facilities requires access not only to pre-primary and primary education for all Afghan children, but also

non-formal programmes designed to meet lifelong learning needs, such as literacy and numeracy programmes, wage-earning skills training, health and agricultural education, and distance learning programmes.

The objective of secondary education is to offer a more diversified curriculum to meet the specific development and reconstruction needs of Afghanistan, and introduce electives or optional subjects into the curriculum. Greater importance should be given to science and technology, and subjects such as health, mathematics and information technology.

The objective of technical and vocational education is to train, through formal and non-formal programmes, the skilled workers and technicians needed for the reconstruction and development of the country. A flexible programme and projects, in cooperation with relevant government agencies, the private sector, rural and urban communities, business, industry and crafts, need to be developed for young people and adults, men and women.

Teacher training programmes will have to be established which will produce the vast numbers of teachers needed for the implementation of the proposed expansion of educational services. In-service teacher training programmes are urgently needed to raise the quality of teaching, and long-term programmes should be prepared for the training of pre-primary, primary, middle and secondary school teachers. The reform of tertiary level institutions should be continued in order to make them more cost-effective and efficient, and improve the quality of teaching. Training in science, engineering, agriculture and management should be strengthened for the reconstruction and development of Afghanistan. Knowledge of a foreign language is essential for university studies.

## **Educational Governance**

In democratic systems, educational development involves society as a whole, including the social, economic and cultural organizations (governmental and non-governmental) and the private sector. It is recognized that educational development is the collective responsibility of the government and communities, and that interaction between educational institutions and business and industry will contribute to the improvement of the quality and development of education and training

Central Government should be responsible for the development of a national system of education, including common standards, broad curricula and certification, at secondary and higher levels of education, and for ensuring that there is equity and justice in the provision of education for all without discrimination. It should also facilitate the participation of civil society in the formulation, implementation and monitoring of educational projects. The future education policies and strategies for Afghanistan should consider decentralization and local governance in the areas that contribute to the improvement, efficiency and relevance of education.

The following measures are proposed for the improvement of educational governance:

A High Council of Education should be established to consider educational policies, and make recommendations to the Government, the Ministry of Education, the Ministry of Higher Education, and other governmental and non-governmental organizations concerned with education and training. The Council would review proposed legislation concerning educational aims, objectives and strategies in Afghanistan, in the light of national goals and social, economic and cultural needs of Afghan society, and the relevant international, educational and scientific norms, and standards. It would also consider education plans, priorities, standards and the allocation of resources for different levels and types of education and training.



A Council for Higher Education should be established to consider policy, regulations, programme development, the standards, evaluation and certification for higher education. It would make recommendations to the Government and the Ministry of Higher Education.

It is proposed to establish an Education Committee in each province, to contribute to development of education based on the needs and priorities of the province. The Education Committees should include the heads of offices of education, agriculture, health, labour and social affairs, women's affairs, information and culture, six members from the provincial education system, and six members from the private sector.

In order to promote cooperation among educational institutions and communities, including the private sector, for the improvement and development of education and training, the following are proposed: school community committees; technical and vocational school industry committees; community education committees; and university, business and industry committees.

Parents, teachers, educators, professors, scientists and other intellectuals play an important part in the improvement and development of education programmes. They should be mobilized and organized, in order to provide guidance and support to the education system. It is proposed to set up parent/teacher associations, an association of teachers, an association of educators and university professors, and professional organizations for scientists, engineers, technicians and master-craftsmen and craftswomen, etc.

The structure of the Ministry of Education, the Ministry of Higher Education and the provincial offices of education, should be reviewed in the light of the educational, administrative and political reforms in the country. The existing structures should be examined in terms of the objectives, organization, functions and personnel.

The needs of an expanding education system and the increasing responsibilities of provincial officers of education, and the role of the private sector and communities in education, should be considered.

## **General Education**

### **Basic Education**

Basic education is a comparatively new approach to education, which was developed during the last quarter of the twentieth century. It was based on the demand for a learning society, in which education for all is a universal human right, it is lifelong and essential for democracy and development. Basic learning needs, as stated in the World Declaration for All (Jomtien, 1990), comprise the essential learning tools and content required by human beings “to be able to survive, to develop their full capacities, to live and work in dignity, to participate fully in development, to improve the quality of their lives, to make informed decisions, and to continue learning”. Basic education includes primary education, formal and non-formal education and training for out-of-school youth, and adult literacy.

Primary education is the foundation of the formal education system, and the quality of the instruction it provides will determine the effectiveness, or otherwise, of all subsequent stages of learning. It is proposed that Afghan children, boys and girls, should have access to compulsory primary and middle school education for a period of nine years. Efforts should be made to achieve nine years of compulsory education for all children (7-15 years) by the year 2015. A new curriculum for primary and secondary schools, in line with the objectives of general education needs to be developed, taking into account the extension of compulsory education to nine years. The curriculum of grades 7, 8 and 9 should provide general education and vocational orientation for students. Local education committees can support the expansion of primary and basic

education. Appropriate facilities, buildings and standards for schools should be established.

It is recognized that the education sector alone cannot meet all the learning needs of society, efforts should be made to collaborate with, and involve, other development ministries, agencies, organizations (governmental and non-governmental) in basic education programmes. In this regard the education sector can serve as a catalyst. While primary education is developed for boys and girls in schools, there is also a need to provide educational opportunities for out-of-school youth, semi-literate or illiterate unemployed adults, and deprived groups such as nomads. It is proposed that a National Centre for the Development of Non-formal Education be established, to develop education and training programmes, aimed at out-of-school youth, and semi-literate or illiterate adults.

Literacy can be provided anywhere, and not only in schools. The following should be considered in the development of literacy strategies: Literacy courses should be functional and relevant, and help in the teaching of wage-earning skills. Student-centred teaching methods should be encouraged for use in literacy teaching. Measures should be taken to recruit and train literacy teachers. All teachers, professionals, craftsmen and women, can contribute to literacy programmes. Secondary school graduates and university and college students should be encouraged and trained to participate in national literacy activities. It is proposed that a national programme for the eradication of illiteracy should be launched. It should be decentralized and conducted in close cooperation with governmental and non-governmental organizations, agencies, institutions, development projects and communities, throughout the country.

## Secondary Education

With the proposed extension of compulsory primary and middle school education to grade 9, secondary education will be from grade 10 to 12. Counselling and vocational guidance will be required in

middle schools, to help students enter the world of work through vocational training, if they are not able to proceed to secondary education. An appropriate secondary school curriculum should be developed based on the economic, social and cultural needs of Afghanistan. Secondary schools should have a common curriculum in the 10<sup>th</sup> grade, and provide options (electives), which concentrate on natural science, social science and the arts, or a vocational stream, in the 11<sup>th</sup> and 12<sup>th</sup> grades. Electives enable students to prepare for higher education, vocational training, or direct entry into the employment market. Special attention should be given to the teaching of science and technology, including computer education.

### Education for Afghan Girls and Women

Basic education is one of the essential needs of Afghan girls and women, if they are to develop their personalities, engage in productive work, and participate fully in the development of the country, improve their quality of life, and achieve personal and social progress. The provision of education for girls and women is not only a personal obligation, but should be seen in the framework of the national needs and realities of present-day Afghanistan. It is proposed that a 'National Education Commission for Girls and Women' be established, to promote and develop gender equality and develop education programmes for girls and women. The National Commission should assist provincial committees in preparing projects for improvement and expansion of formal and non-formal education and training activities for girls and women

### Education for Peace and Human Rights

Human rights and peace education aims at providing pupils and students with the abilities to accept, and produce, societal changes. All the knowledge and skills that lead to human and social development and personal well-being, should be an integral part of formal and non-formal education. Schools should become places where future citizens undergo an apprenticeship in democracy, where human rights are taught and respected, and an appreciation of

freedom is acquired, together with an ability to solve conflicts peacefully.

The training of personnel at all levels of the education system – teachers, planners, managers and teacher educators, must include education for peace and human rights. Young people who are out-of-school, and who do not have access to formal education, or to vocational training, or are unemployed, are an important target group of education programmes designed to promote peace and human rights. Basic education programmes should give particular importance to subject matter relating to peace and human rights. All culturally suitable media such as folklore, popular theatre, community discussion groups and the radio, should be used for mass education purposes.

## **Teacher Education**

The qualifications of teachers for the various levels of learning should be given careful consideration. Both short and long-term programmes must be developed to meet the enormous educational challenge that now has to be faced. The recruitment of both men and women to the teaching profession will be necessary, and will also be an important means of providing employment for secondary school leavers and university graduates. Teacher training colleges should be established in all provinces to develop pre-service and in-service training. In the present conditions in Afghanistan, when teachers are in short supply and many teachers are under-qualified, an extensive programme of emergency training and in-service training should be organized. In order to meet the current demand, shorter courses and supplementary forms of training, such as distance education, and ‘open’ university type courses should be considered.

In general the requirements for teachers qualifications should be 2-4 years of post-secondary education in a Teachers College or a Faculty of the University. Teacher training programmes should be developed for the following type of schools and subjects: pre-

primary, primary and basic education, middle and secondary level, technical and vocational, arts and crafts, physical education and health education. Special programmes should be developed for the training of head teachers, and guidance and counselling personnel for the education system.

### **Technical and Vocational Education**

The social and economic development of Afghanistan requires trained manpower, including skilled workers and technicians for construction, crafts and industry, agriculture, health science, commerce and management etc. A national system of technical and vocational education, for formal and non-formal training, should be developed, with the following objectives:

To provide education and training for a large number of Afghan young people, both boys and girls, for occupations and employment (or self-employment);

To help semi-literate and illiterate young people and adults (men and women), to acquire basic wage earning skills in order to have a useful and productive life;

To promote continuing education, retraining programmes, and lifelong learning;

To promote and develop traditional fine arts and handicrafts;

To promote entrepreneurship and economic growth;

To contribute to the protection of the environment, and promotion of sustainable development.

## Implementation Strategies

A National Board for Technical and Vocational Education should be set up to coordinate policy and ensure consultation and cooperation among government departments, agencies, industries and services and the private sector.

A balanced development of technical and vocational education, and equity of access for population groups in different regions of the country are important considerations. Flexible structures should be set up for different types and levels of technical and vocational education and training, taking into account the target populations, and the needs of rural and urban communities.

It is proposed that centres of technical and vocational education and crafts, for formal and non-formal training, should be established in every province and district. Measures should be taken to provide vocational training facilities for girls.

A National Institute for Technical and Vocational Education should be established for the development of occupation profiles, curricula and standards, teaching materials and techniques including distance education, and training of teachers, supervisors and administrators for technical and vocational education.

## **Higher Education**

### Tertiary level institutions

The following are the tertiary level institutions in Afghanistan at the present time:

Kabul University; The Afghan Education University; The Kabul Medical University; The Kabul Polytechnic Institute; Nangrahar University; Balkh University; Herat University; Kandahar University;

Khost University; Alberoni University; Takhar University; Jowzjan Institute of Higher Education; Badakshan College.

### Strategic Plan

It is proposed to consolidate and strengthen the five regional universities of Balkh, Herat, Kandahar, Khost and Nangarhar. Furthermore, the medium term goals of the higher education consider the following: (1) to ensure that at least one of the provincial institutions of higher learning have one good classroom, dormitory and administrative complex (2) to retrain the faculty staff rapidly (3) to provide computer centres, laboratories and libraries for various institutions (4) to increase the number of women working in every aspect of higher education (5) to reduce the number of institutions, but to improve their quality (6) to rationalize the acceptance of new students among various disciplines and institutions, according to national needs (7) to introduce transparency, accountability, responsibility, discipline, and integrity into the system.

### Community colleges

In order to provide additional opportunities for post-secondary education for the increasing number of secondary school graduates, and train the urgently needed middle level professionals and technicians in a wide range of occupations, it is proposed to establish in each province at least one multi-purpose, two year Junior Community College.

### Science and Technology

In view of the importance of science and technology for sustainable development, it is proposed that a national policy and long-term strategic plan for capacity building in science and technology be prepared for the reconstruction and development of Afghanistan.



## **Research and Development**

It is proposed to establish the following National Institutes and Centres for the development of education and training in Afghanistan:

### **1. Institute for educational policy, planning and management**

With the expansion of education in Afghanistan, educational policy and planning will become increasingly complex and important, since they will involve educational authorities at the national, provincial and district and community levels. It will be necessary to undertake policy studies and prepare educational plans, taking into account all educational needs and resources. Trained personnel in educational planning will be required. The role of educational managers will be crucial for the preparation and implementation of educational plans, for coordination with non-formal education and community institutions and the private sector. A National Institute for Educational Policy, Planning and Management should be established for policy studies and research, preparing the education development plans and training of key personnel for the planning, administration and management of the education system.

### **2. Institute for Educational Research**

#### **a. Curriculum and Textbook Development**

The curricula of primary and secondary schools need to be revised, and appropriate textbooks and teachers' guides developed. The syllabus and content of existing subjects should be updated, and the syllabus and content of new subjects (skills, technology, civics, environmental studies, etc.) prepared. Student achievement tests and other evaluation tools also need to be prepared. The development of curricula and textbooks is a long and complex process. The development and use of audio-visual aids and new technologies are increasingly important for the effective application of curricula, and for teaching and learning. With the reform of education, curriculum

development will become a major operation, requiring sustained effort, specialist staff, and adequate facilities. It is proposed to establish a Division for Curriculum and Textbook Development.

#### b. Social Studies, Democracy, Peace and Human Rights Education

As a consequence of the conflicts during the last two decades of the twentieth century, Afghan society became polarized. Children and young people inside and outside the country were raised in diverse ideologies and in a culture of war. Those people were divided along religious, tribal, ethnic and racial lines. Education can play an important part in bringing together the different ethnic groups of the Afghan people. The conflicts also brought about an increased political awareness among people. Education for understanding democracy is crucial for the future governance of Afghanistan. It is proposed to establish a Division of Social Studies, Democracy, Peace and Human Rights Education. The Division should undertake studies on Afghan society and develop teaching materials in social studies, civics education, peace and human rights, and the understanding of democracy for schools and adult education programmes.

#### c. Special Needs Education

There are a large number of physically and mentally handicapped children, young people and adults, among the returning refugees and displaced persons in the country. A project on 'education for special needs' should be developed. As a first step, studies should be undertaken to determine the size and nature of the handicapped population, by age, sex and geographic location. It is generally accepted that handicapped children and young people, should be integrated into normal schools, as far as possible. For severely handicapped people, such as the blind and the deaf, special courses or schools need to be established. The project involves planning, teacher education, the preparation of guides and teaching and learning materials. It is proposed that a Division for Special Needs

Education be established in the Ministry of Education to coordinate and develop a programme in this area.

#### d. Science and Technology Education

The teaching of science and technology to children and young people is an important part of the curriculum of general education. The content of science education needs to be constantly updated. It is also important that science education should be adapted to the needs and environment of the students. The teachers should also be trained and retrained in this field. Science and technology education require appropriate textbooks, teaching aids, laboratory equipment and other facilities. To improve and develop science education, a National Centre was established in the Ministry of Education in 1970. It is proposed to further develop the National Centre for Science and Technology Education.

#### e. Information Technology and Training

Information and communication technologies play an increasingly important part in modern society. It is necessary that an appropriate infrastructure for the planning, coordination and development of computer education should be established. The objective of computer education is to familiarize students with the computer, and with its application in word and data processing, and in the acquisition and management of information and simple programming. In addition courses for the training of computer programmers, technicians and engineers need to be organized in technical and vocational schools and universities. It is essential to train teachers, computer programmers, and technicians for their maintenance and repair. Institutions of higher education, teacher training, post-secondary technical and vocational education, and other centres concerned with educational development, should have access to the Internet. It is proposed that a National Centre for Information Technology and Training be set up, to ensure the development of computer education in the country.

## f. Distance Education

In Afghanistan, there are thousands of untrained teachers, inspectors and other personnel, who need guidance and training. There are millions of out-of-school Afghan children and young people, who are illiterate, without skills, and unemployed. Distance education, combined with short training courses in education centres, can prepare them for a healthy and productive life. The population in general need to be well informed and educated, to confront their daily problems and needs (nutrition and health, hygiene and sanitation, childcare, security, etc.). In the reconstruction process and the development of a democratic system in Afghanistan, distance education (radio and television) will be a powerful tool for informing and educating the public, and seeking their participation and cooperation in nation building.

As a long-term strategy, and an effective way of expanding formal learning, for secondary and higher education, and for the informal education of young people and adults, a national and regional infrastructure for distance education should be developed. It is proposed to set up an Advisory Board and a National Centre for Distance Education. The objectives of the Centre would be to prepare a long-term plan of action for the use of distance learning in education and training; set up a network of regional centres and facilities for distance education; develop programmes and train specialist personnel.

## 3. Regional Education Resource Centres

The development of modern education requires participatory planning at national, provincial, district and community level. With the expansion of education in Afghanistan, the Provincial Education Offices will be expected to play an increasing part in the planning and execution of education programmes. These offices will need specialists in educational planning and development. It is recommended that a Unit of Educational Development be set up in

each Provincial Office of Education. Furthermore, there is a need for regional structures to carry out studies and experimental activities, in-service training, and to provide support for educational planning and management in the region. It is proposed to establish Regional Education Resource Centres, attached to selected Teacher Training Colleges, to provide professional support to Educational Development Units in the provinces.

## **National Development Strategy**

The National Development Strategy, which was presented by the Government of Afghanistan to the London Conference in January 2006, focuses on security, governance, economic growth and poverty reduction. The government's aim, as stated in the National Development Strategy document, is the following:

In the next fifteen years, the government aims to ensure that Afghanistan meets all of its millennium development goals. If this vision is achieved, we will all but eliminate extreme poverty and hunger in Afghanistan. All our children, boys and girls alike, will complete their primary education. Afghanistan's women will enjoy greater equity in education, political participation and justice. We will cut by more than half the number of children dying before they reach five, and the number of mothers that die in childbirth. We will halt the spread of tuberculosis, HIV/AIDs, malaria and other diseases and ensure that our development is environmentally sustainable. And we will accomplish all of this through a strong partnership with the international community that helps to provide the security and to support the stable political environment upon which our economic development will depend. The government firmly believes that without concurrent progress on all three pillars, its vision will not be fulfilled, and Afghanistan risks a circle of injustice.

### **Development of Education**

#### **Programmes and Objectives**

The government's goal, in the education sector, is to significantly improve the quality of, and promote equitable access to, education, skills development and other social services in order to re-invigorate Afghanistan's human capital, reduce poverty and

facilitate economic growth. The objectives in educational development will be the following:

1. Expand access to primary and secondary education, increase enrolment and retention rates, and strengthen the curriculum and quality of teachers;
2. Build a well-managed and internationally recognized system of higher education that responds to Afghanistan's growth and development needs;
3. Develop an effective skills development system that is responsive to labour market needs;
4. Expand a culture media and sports programme that expands coverage and freedom of the press, safeguards and rebuilds Afghanistan's cultural heritage, and improves access to sports.

Universal access to primary and secondary education is the foundation for literacy, skills development and the establishment of a productive work force, essential elements of human capital. Provision of higher education extends the opportunities offered by the primary and secondary education programme, supplying the public and private sectors with leaders. Non-formal education, apprenticeship programmes and vocational education and training will provide workers with skills relevant to the evolving needs of employers and the economy. Culture, media and sport round out the sector strategy by developing the full citizen.

The constraints to achieving the educational goals are immense. The legacy of conflict, combined with gender discrimination and under-investment in social development, has led to the depletion of Afghanistan's human capital. Lack of equitable access and the poor quality of education opportunities are severely limiting people's ability to participate productively in the economy. The shortage of both qualified and experienced professionals is a significant constraint to the development of an effective, modern and responsive civil service, as well as a vibrant private sector. Due to a complete absence of vocational training capacities and

opportunities, skilled and semi-skilled labour must be imported from within and outside the region at a high cost.

### Five-year Benchmark

By the end of 2010 in line with Afghanistan's millennium development goals, net enrolment in primary school for girls and boys will be at least 60% and 75% respectively; a new curriculum will be operational in all secondary schools, female teachers will be increased by 50%; 70% of Afghanistan's teachers will have passed a competency test, and a system for assessing learning achievement, such as a national testing system for students, will be in place. By 2010, enrolment of students in universities will be 100,000, with at least 35% female students; and the curriculum in Afghanistan's public universities will be revised to meet the development needs of the country and private sector growth. A human resource study will be completed by end-2006, and 150,000 men and women will be trained in marketable skills through public and private means by the end of 2010.

### Programme Strategy:

The government will support teacher training by adding distance learning and will develop modern curricula and quality monitoring mechanisms. Infrastructure and supply programmes will be expedited to ensure coordinated and timely efforts and universal coverage.

The government will rationalize the network of schools and review the service conditions and pay of education personnel. Community participation in school management will be encouraged.

Success cannot be measured only by sending children to school, but by equipping them with the necessary literacy, numeracy, problem-solving and critical thinking skills needed to face the challenges and requirements of an expanding peacetime economy.



The tertiary education sector, regulated by the Ministry of Higher Education, will include universities (public and private), colleges and training institutes. The government will limit the number of publicly funded higher education institutions to ensure quality and focus on graduating the next generation of public and private sector leaders. Public universities will have increased institutional autonomy, but will adhere to regulations set by the Ministry. The government will pursue partnerships with the private sector and education foundations for resource mobilization and diversification of higher education opportunities.

The government will conduct a national skills assessment survey, establish advisory committees to oversee the development of the vocational education and training programme and accelerate the national skills development Programme. The roles of the government, private sector and NGOs will be clarified, with government in the managerial role and the private sector and NGOs implementing programmes, as per the national strategy. Linkages to countries and institutions beyond Afghanistan will strengthen national capacity. The government will continue to focus on developing the skills of unemployed older youths and demobilized soldiers, but also ensure that there is gender equity across the skills development programme, and vulnerable groups are given access to appropriate opportunities to strengthen their livelihood security.

## Programme Priorities

### 1. Education Policy and Reform

To improve the education system in Afghanistan, it is important to put in place the necessary education policies and reform the existing system. It is important to strengthen educational administration and management in order to effectively deliver services. At present the three tiers of the basic education system including district, provincial and central levels are severely constrained in delivering services due to limited facilities, weak institutional and administrative systems and the lack of technical and managerial

capacity to implement, coordinate and manage education development programmes.

The higher education framework needs to be developed to cater for the modern economy and society. As such priority is given to the development of suitable legal and institutional frameworks to encourage the participation of private sector organizations, reform the curricula, standardize faculty rankings and restructure existing universities. At the same time it is important to develop the administrative, management and policy development capacity of the Ministry of Higher Education to conceptualise and manage structural change.

It is also important to further strengthen district and local education and vocational training sector planning and management by increasing the capacity of provincial and district level offices and enhancing the role of community organizations, in providing and managing educational and vocational training services at the local level. Private sector and civil society organizations have been a crucial influence in social mobilization and creating educational opportunities for many. It is important to engage the private sector where they are more efficient and cost effective, especially in the current situation of capacity and resource constraints.

## 2. Education Infrastructure

The major impediment to the delivery of education and vocational training sector services is the lack of physical infrastructure. For the sector to prosper the basic infrastructure of schools, universities, non-formal institutions, and vocational training institutions needs to be rebuilt. The number of children and young people in primary and secondary schools is estimated to reach 6 million in 2005/06. In order to meet the rapidly growing demand for education over 1700 schools need to be rebuilt so the number of schools will top about 10000. From among this number, about 3000 schools have buildings but the remaining schools are in rented houses, mosques, and tents or in the open space. In addition to basic furniture, it is important

that adequate teaching and learning materials are provided to all schools.

Tertiary education is important for laying the foundation for a skilled and professional labour force. There has been a rapid increase in enrolment in higher education institutions. Enrolment in 2005 was 36,786 students including 7,990 female students. Approximately 60 % of students are in the early years of tertiary education, and they are overwhelmingly male. The movement of this cohort through the system over the next few years will create immense pressure on the system. It is therefore important to improve university facilities including rehabilitation and construction of teaching and accommodation facilities and upgrading tertiary institutions around the country to cater for the growing number of students.

### 3. Curriculum, Textbooks and Teacher Development

It is necessary to address the issue of education quality, which would be important for creating a skilled human resources base, responsive to the needs of Afghanistan. The quality of education is crucially dependent on the curriculum, textbooks and the calibre of teachers. Under the on-going work, a new curriculum framework has been developed. Textbooks for Grades 1 and 4 have been developed and introduced at the beginning of the 2005 school year. Other textbooks are under preparation.

The main issues of teacher development relate to low qualifications, shortages of teachers and poor living conditions. At present there is an acute shortage of qualified and trained teachers at all levels of the education system. While a number of short term in-service programmes have been carried out, it is important to provide an institutional basis for on-going teacher development over the long term by strengthening teacher training in Kabul University, University of Education and teacher training institutes; provide overseas fellowships for teachers; and establish a National Academy of Education to develop new models of teaching excellence,

curriculum, and methods of teaching that would be disseminated nationally through Teachers Colleges in each Province.

#### 4. Equipment

Providing students, teachers and institutions with the basic materials to implement education and vocational training is a fundamental component of the education development programme. Due to the shortage of essential furniture and other facilities and due to the large number of students, classes are currently conducted on two or three shifts per day. It is therefore urgent that sufficient school furniture and emergency facilities are provided immediately to accommodate and improve the access of all students around the country. From an administrative perspective the past two years has seen some improvement in administrative facilities with the rehabilitation of educational offices in the centre and provinces and the provision of office furniture and equipment.

#### 5. Vocational/Technical and Non-Formal Education

The country's vocational education infrastructure was almost totally destroyed during the years of war and civil conflict and after being practically closed for several years they are now beginning to function again. Many institutions, however, do not have the necessary facilities and equipment or trained staff. In order to properly integrate vocational education with the needs of the country's growing economy it is important to establish a curriculum and training syllabi that is responsive to the needs of the economy and the labour market. It is imperative to invest urgently in the rehabilitation of vocational training schools and to develop a new curriculum and textbooks, and improve teaching capacity in order to achieve the wider objectives of national development in the post-conflict era.

A national skills development Programme will be developed. This programme aims to provide skills training to match the immediate needs of the labour market, and particularly for the worst affected

groups in the community so as to enable them to obtain employment. In the short term and medium term to facilitate the provision of the skills required by those sectors of the economy that are already facing critical skill shortages, or are anticipated to grow rapidly. Over the medium to long-term, develop a skills training system that will ensure the provision of quality training for Afghans that meet the needs of a modern market economy in an efficient, effective and equitable manner.

While exact figures are not available, literacy is clearly among the lowest in the world. It is important to provide basic numeracy and literacy to allow people to meaningfully participate in the development process. Some efforts were made during the previous years to initiate literacy programmes. Additional and intensive literacy and non-formal education needs to be provided to increase coverage and enhance the continuation of students into formal and vocational streams. New and innovative approaches are needed to rapidly increase functional literacy and extended literacy and non-formal education to distant and inaccessible areas, which requires continuing investment in educational technology, training, materials and equipment.

## **Work Plans**

### **Primary and Secondary Education**

#### **1. Planning and Capacity building**

- Preparation of education development plan up to 2015.
- Planning for gradual provision of compulsory education (nine years) for all children, in accordance with the new Constitution of Afghanistan.
- Enhancing the capacity of key academic and professional personnel of the education system, at central and provincial levels.

- Absorbing 1.5 million new pupils (boys and girls) in 2004/05, 1.0 million in 2005/06, 0.6 million in 2006/07, and 0.7 million in 2007/08 in primary education.
- Developing the capacity of the school system to cope with an estimated enrolment of 9.4 million students in primary and secondary education in 2015.
- Recruiting 163,000 additional teachers for primary and secondary schools during the period of five years (2004-2009).

## 2. Curriculum and Facilities

- Research and studies for modernization and improvement of the quality and efficiency of the education system.
- Development of modern curricula and textbooks for primary and secondary schools.
- Provision of textbooks, laboratories, libraries, furniture and equipment for schools.
- Redevelop and equip the Educational TV Centre so that it will become functional by 2008/09.
- Training of 50,000 teachers for the application of the new curricula in primary and secondary schools.
- Rehabilitation of school buildings and construction of new schools, with the support of organizations and communities; a total of 6,000 schools will be rehabilitated or reconstructed by 2008/09 through out the country.

## 3. Teacher Education

- Establish and equip teacher-training colleges in all 32 provinces.
- Rebuild and rehabilitate 21 teacher-training colleges to become functional by 2008/09.
- Institute a system of recruiting teacher-trainees in Grades 10, 11 and 12.
- Provide continuous in-service training using open education and distance learning modes.

- Provide in-service training for 100,000 teachers throughout the country by 2008/09.
- In order to improve teacher performance and reach large numbers of teachers, continue to develop radio-based teacher training and enhance its quality.
- Continue the accelerated training programme for teachers across the country, especially for women in rural areas.
- Initiate the self-development of teachers through interactive learning and by establishing resource centres.
- Attract qualified teachers from outside the education sector; motivate teachers who had left the country to return.
- In order to attract and retain teachers in their profession, improve their living conditions through such measures as the establishment of cooperatives for teachers, medical benefits and housing accommodation.

## Higher Education

### 1. Enhancement of Quality

#### Facilities Development

- Providing for an estimated 100,000 qualified students by 2010 and preparing to meet the demands of 1 million high school graduates by 2014.
- Providing a full modern library, IT, laboratories and/or workshops at each of the higher education institutions.
- Exploring the possibility of interactive and distance education for faculty and students where conditions permit.

#### Academic Reform and Curriculum

- Enhancing the capacity of the existing 2000 faculty; and preparing three thousand additional qualified faculties.
- Conducting curriculum reform to make higher education congruent with national, regional and global realities.

- Introduce graduate Master's degree programmes in selected fields in key institutions.
- Establishing a modern testing and professional evaluation centre
- Establishing English as the medium of instruction in selected institutions.

## 2. Systemic Reform and Management

### Infrastructure, Administration and Organization

- Implementing the new higher education law – delegation of decision- making and operational authority to institutions of higher education in a phased manner.
- Continuing the infrastructure development – building renovation and expansion of facilities throughout the 18 institutions of higher learning in the country.
- Instituting modern administration, management and accounting in the higher education system.
- Establishing an independent accreditation agency; and working with the tertiary institutions to reach international quality standards.

## 3. Educational Access

- Establishing two-year vocational/technical community colleges in each of the provinces.
- Starting “evening colleges” throughout the country to make better use of facilities and to make education more accessible to working students.
- Launching programmes specifically designed to increase the number of women to 50 % of the students, faculty and staff in higher education.



#### 4. National and International Partnerships

- Exploring the possibilities of cost sharing of higher education by its constituents and recipients.
- Developing cooperation between higher education and the private sector.
- Establishing partnership with international universities.
- Establishing professional academic organizations of faculty, administrators and students.

# **Education For Sustainable Development**

## **Definition**

The concept of development has evolved in view of the social and ethical concerns in societies, and the growing economic disparities between nations and among peoples within the same country. Traditionally building infrastructures such as roads and communication network, hospitals, schools, manufacturing industry, agriculture etc. was the main concern of development. Economic growth was the primary objective of development. During the last two decades of the twentieth century, in addition to economic productivity, the social, cultural, environmental and human dimensions of development have also been emphasized. During the latter part of the twentieth century a number of worldwide conferences were held to reflect on the concept of development and provide guidance and inspiration to nations and the international community. A worldwide consensus has emerged that the ultimate goal of governments and organizations should be sustainable human development, sharing and cooperation among nations, and promotion of peace and prosperity around the world.

Since 1990, the United Nations Development Programme has produced an annual report on Human Development. This Report uses the Human Development Index (HDI) for a comparative measure of poverty, literacy, education, life expectancy and other factors for countries worldwide. The HDI measures the average achievements in a country in three basic dimensions of human development: a long and healthy life, as measured by life expectancy at birth; knowledge, as measured by the adult literacy rate (with two-thirds weight), and the combined primary, secondary, and tertiary gross enrolment ratio (with one-third weight); a decent standard of living, as measured by gross domestic product (GDP) per capita at purchasing power parity in US dollars. Each year, UN member states are listed and ranked according to these measures.

The report for 2005 shows that, in general, the HDI for countries around the world is improving, with some exceptions.

Since the 1970s, sustainability has been at the forefront of the development movement. The United Nations Conference on the Human Environment (Stockholm, 1972) adopted a declaration for preservation and enhancement of the human environment. Twenty years later the United Nations Conference on Environment and Development (Rio de Janeiro, 1992), commonly referred to as the Earth Summit, approved a set of principles supporting sustainable development. The World Summit on Sustainable Development (Johannesburg, 2002) adopted a declaration on sustainable development, and a plan of implementation, which were endorsed by the General Assembly of the United Nations. Education is considered to play an important role for the promotion of sustainability. The United Nations established a Decade (2005-2014) of Education for Sustainable Development.

What is sustainable development? A popular definition, from the Brundtland Report *Our Common Heritage* (1987), states: ‘Sustainable development is development that meets the needs of the present without compromising the ability of the future generations to meet their own needs’. The publication ‘*Caring for the Earth: A Strategy for Sustainable Living*’ (1991), contains a definition of sustainable development which complements the one from *Our Common Heritage*. It defines sustainable development as ‘improving the quality of life while living within the carrying capacity of supporting ecosystems’. The key issues for sustainability were identified at the Earth Summit (Rio de Janeiro, 1992) and further reaffirmed by the World Summit on Sustainable Development (Johannesburg, 2002). The global issues that affect individual nations and communities come from the three spheres of sustainable development – environment, society and economy.

## **International Consensus**

Environmental education is an important part of education for sustainable development. The Intergovernmental Conference on Environmental Education (Tbilisi, 1977), organized by UNESCO in cooperation with the United Nations Environment Programme (UNEP), emphasized the relationship between environment and development and made recommendations on the role, objectives and guiding principles of environmental education. It was recommended that the environment should be considered in its totality – natural, built and the social components; environmental education needs to be interdisciplinary, problem-solving and community based; it should cover all age groups both inside and outside the school system, in the context of life long education. UNESCO and UNEP conducted an international programme for the promotion of environmental education worldwide during the 1980s and 1990s.

The World Conference on Education for All (Jomtien, 1990) emphasized the importance of basic education for sustainable development, which was reaffirmed at the World Education Forum (Dakar, 2000). The Forum proposed the following goals:

- Ensure that all children have access to primary education by 2015
- Expand and improve comprehensive early childhood care and education
- Ensure that all adolescents and youth have equitable access to appropriate learning and life skill
- Promote adult literacy and continuing education
- Eliminate all forms of gender discrimination in the education system, and by 2015 ensure full access to basic education for girls and women

The Earth Summit approved a plan of action, Agenda 21, that sets out a blueprint for sustainable activity across all areas of human endeavour. Agenda 21 has 40 chapters including one on ‘Combating poverty (Chapter 3), ‘Science for sustainable development’ (Chapter

35) and ‘Promoting education, public awareness and training’ (Chapter 36).

Chapter 36 concerning promotion of education, public awareness and training, cover the following programme areas:

1. Re-orienting education towards sustainable development, with the following objectives:

- (a) To strive to ensure universal access to basic education, and to achieve primary education for at least 80 per cent of girls and 80 per cent of boys of primary school age through formal schooling or non- formal education and to reduce the adult illiteracy rate to at least half of its 1990 level.
- (b) To achieve environmental and development awareness in all sectors of society on a world-wide scale as soon as possible;
- (c) To strive to achieve the accessibility of environmental and development education, linked to social education, from primary school age through adulthood to all groups of people;
- (d) To promote integration of environment and development concepts in all educational programmes, and give special emphasis to the further training of decision makers at all levels.

2. Increasing public awareness, with the following objective:

To promote broad public awareness as an essential part of a global education effort to strengthen attitudes, values and actions which are compatible with sustainable development. It is important to stress the principle of devolving authority, accountability and resources to

the most appropriate level with preference given to local responsibility and control over awareness-building activities.

3. Promoting training, with the following objectives:

- (a) To establish or strengthen vocational training programmes that meet the needs of environment and development with ensured access to training opportunities, regardless of social status, age, gender, race or religion;
- (b) To promote a flexible and adaptable workforce of various ages equipped to meet growing environment and development problems and changes arising from the transition to a sustainable society;
- (c) To strengthen national capacities, particularly in scientific education and training, to enable governments, employers and workers to meet their environmental and development objectives;
- (d) To ensure that environmental and human ecological considerations are integrated in all functional management areas, such as marketing, production and finance.

### **Decade of Education for Sustainable Development**

The United Nations General Assembly decided, in December 2002, to declare a United Nations Decade of Education for Sustainable Development (DESD) spanning from 2005 to 2014. The primary goal for the Decade is to encourage Governments to consider the inclusion of measures for sustainable development in their respective education systems and strategies and, where appropriate, into national development plans. UNESCO was requested to develop a International Implementation Scheme for the Decade.

## Major thrusts of Education for Sustainable Development

Improving access to quality basic education. The first priority of ESD is improving the access to and quality of basic education. The content and years of basic education differ greatly around the world. Access to basic education remains a problem for many, especially girls and illiterate adults. Unfortunately, simply increasing basic literacy will not advance sustainable societies. Indeed, if communities and nations hope to make progress towards sustainability goals, they must focus on knowledge, skills, values, and perspectives that encourage and support public participation and community decision-making.

Reorienting existing education programmes. Creating a more sustainable future will not occur simply by increasing the amount of education; instead, it is an issue of content and relevance. Questioning, rethinking, and revising education from pre-school through university to include more principles, knowledge, skills, perspectives and values related to sustainability in each of the three realms – environment, society and economy – is important to our current and future societies.

Developing public understanding and awareness of sustainability. To make progress towards more sustainable societies requires a population that is aware of the goals of sustainability and has the knowledge and the skills to contribute towards those goals. An informed citizenry can help communities and governments enact sustainability measures and move towards more sustainable societies.

Providing training. All sectors – including business, industry, higher education, governments, non-governmental organizations and community organizations – should be encouraged to train their leaders in sustainability issues such as environmental management, equity policies, etc., and to provide training to their workers in sustainable practices.

## **Key characteristics of education for sustainable development**

ESD has essential characteristics that can be implemented in many culturally appropriate forms. Education for sustainable development:

- is based on the principles and values that underlie sustainable development;
- deals with the well-being of all three realms of sustainability – environment, society and economy;
- promotes life-long learning;
- is locally relevant and culturally appropriate;
- is based on local needs, perceptions and conditions, but acknowledges that fulfilling local needs often has international effects and consequences;
- engages formal, non-formal and informal education;
- accommodates the evolving nature of the concept of sustainability;
- addresses content, taking into account global issues and local priorities;
- builds civil capacity for community-based decision-making, social tolerance, environmental stewardship, adaptable workforce and quality of life;
- is interdisciplinary. No one discipline can claim ESD for its own, but all disciplines can contribute to ESD;
- uses a variety of pedagogical techniques that promote participatory learning and higher-order thinking skills.

Sustainable development emphasizes quality education. A UNESCO document includes the following objectives for quality education:

- Quality education supports all of the human rights;
- Education for All; knowledge, life skills, perspectives, attitudes and values;
- Considers the social, economic, cultural and environmental contexts of a community;



- Promotes the ideals of a sustainable world – a world that is just, equitable, and peaceable;
- Preservation of the environment and rational use of natural resources; tools to transform current societies to more sustainable societies;
- Considers the past and prepares for the future (as an individual, a family member, community member, and a global citizen).

## **The Millennium Development Goals**

In September 2000, the United Nations General Assembly (the millennium summit) adopted a Millennium Declaration aimed at improving the lot of humanity in the new century. It concerned values and principles, peace and security, development and poverty eradication, protection of the humanity's common heritage, human rights, democracy, good governance etc. As a follow up to the Millennium Declaration, the following development goals, as approved by the United Nations, were established (to be achieved by 2015):

1. Eradicate extreme poverty and hunger
2. Achieve universal primary education
3. Promote gender equality and empower women
4. Reduce child mortality
5. Improve maternal health
6. Combat HIV/AIDS, malaria and other diseases
7. Ensure environmental sustainability
8. Develop a global partnership for development

## **Sustainable Development in Afghanistan**

After more than two decades of political and social conflict and destruction in Afghanistan, the country has begun the process of reconciliation and establishing a democratic government and tackling the urgent needs of reconstruction and development. The

National Development Strategy (2006), which outlines the government's millennium development goals for the next fifteen years, emphasizes the importance of three pillars for achievement of development goals: (a) partnership with the international community; (b) security and a stable political environment; (c) economic development. These pillars correspond to the spheres of sustainable development, which are environment, society and economy.

The security situation in Afghanistan is of paramount importance. After years of political and ethnic conflict, there are still local and regional elements that, for various reasons including political and economic gains, are opposed to a democratic centralized government system. Furthermore, some elements of the Taliban with the military and financial support of foreign groups and possibly governments continue to harass the local population in the southern provinces. The international community is helping the government to try to establish security in the country, and at the same time support the training of Afghan army and police. In view of the complexity of the security situation, which is influenced by internal and mainly external factors, it will probably take some time and significant national and international efforts to establish a completely secure climate for development, particularly in the southern region of Afghanistan.

Since 2002 there has been progress in political stability by electing a president and the national parliament. This stability, however, is fragile and needs to be nurtured and supported by the people and the international community. Afghan society needs to acquire experience in democracy. The political and ethnic leaders have responsibility for the maintenance of peace and stability in the country. To ensure continued stability, significant efforts are needed to reduce poverty and improve the living conditions of the people including the returning refugees. The government administration and the justice system need to be modernized; law and order must be enforced, and human rights respected. The government has recognized the importance of anti-corruption measures, which are

essential for the normal functioning of the administration in the country. Many of the social problems, which impact on political stability and economic development, are chronic and widespread and require sustained efforts to resolve.

In view of the extent of damage and destruction in the country during the 1980s and 1990s and lack of basic economic infrastructure and necessary schools, hospitals etc., the task of reconstruction of Afghanistan is formidable. The internal resources generated from lawful economic activities and the corresponding national revenue for social and economic development is very limited. The international community has, so far, provided the necessary funds for development. In the fiscal year 1385 (2006/2007) about 40 % of the regular operating budget and most of the development budget are funded from external sources. Capacity building in management and administration at national, provincial and district levels, with devolution of responsibility, transparency and accountability, will contribute to the efficiency of the development process. Economic activities leading to increased resource generation and revenue for the national treasury will be essential for sustainable development.

Protection of the environment is an important objective for sustainability. The state of the environment in Afghanistan needs urgent attention. There is much degradation and pollution in most of the towns and countryside including villages. The natural resources especially the rivers, forests and land for cultivation should be developed and exploited efficiently. The rehabilitation and improvement of urban and rural environment in Afghanistan will take time and requires substantial resources including trained technical and management personnel. Environmental awareness and education and training can make a significant contribution in preservation and enhancement of the environment. A National Environmental Protection Agency has recently been established to take the necessary measures for the development of the environment.

## Education and Training

The objectives of Education for All (Dakar Framework of Action) and the Decade of Education for Sustainable Development have been integrated with the Millennium Development Goals. The Afghan Government Education Strategy is expected to meet the millennium development goals, based on the social, economic and cultural context of the country. In quantitative terms, these measures are proposed within the limit of potential available technical and financial resources. The quality and relevance of education and training at all levels – basic education, secondary education, technical and vocational training, and higher education - will have an impact on sustainable development. In the light of the recommendations of the relevant international conferences and experience of other countries, attention should be given to the following:

1. The concept of sustainability should be integrated in all educational programmes. The relationship between social and economic concerns and the environment needs to be studied and clarified, taking into account the requirement of development at the national and local levels. The international economic and environmental issues and their impact on Afghan society should also be studied. Based on these studies, guidelines should be prepared to incorporate education for sustainable development in the curriculum of general education and teacher training programmes.
2. Education and training programmes should contribute to eradication of poverty, health care, meeting other basic needs, and improvement of the living standard of Afghan people. Attention should be given to the expansion of basic education, through formal and non-formal learning and life skills; greater effort is needed to improve equitable access to education for girls and women. Distance education, such as radio and television programmes, will be an important vehicle for public awareness in environment and development issues such as sanitation, pollution, drug addiction, deforestation and preservation of the environment.

3. The training of flexible and adaptable workforce including managers, engineers and technicians, conversant with social, economic and environmental issues, will contribute to sustainable development. The authorities in universities and those responsible for formal and non-formal technical and vocational training ensure that the knowledge and issues related to sustainability are reflected in relevant courses and training schemes. An introductory course on issues of sustainable development could be made a general requirement for all university students.

4. The development of scientific capacity for training, research and innovation will contribute to sustainable development. The ability to apply science and technology in the development process, including information and communication technologies, will accelerate economic growth. It will also contribute to the reduction of poverty and reconstruction of Afghanistan. Interdisciplinary research on social, economic and environmental issues produces information and scientific knowledge which will assist decision makers and managers in their action for sustainable development.

5. Local communities can help in the promotion of relevant education and sustainable development. School community committees and parent/teacher associations can discuss ways and means by which students learn about local social, economic and environmental problems and contribute to their solution. Universities and technical training colleges can prepare guides for students and local communities for promotion of sustainability on food and nutrition, social equity, energy and water supply and consumption, recycling and waste management, and protection of the environment. Public awareness on regional and national environmental concerns and global issues such as the climate change could also be promoted.

# **Science and Technology and Economic Growth**

## **Science and Development**

Science and technology has had a major impact on the social, economic and cultural development of nations, particularly in the industrialized countries. The first industrial revolution in the late 18<sup>th</sup> and early 19<sup>th</sup> century, beginning with the invention of the steam engine and later the internal combustion engine resulted in replacing the economy based on manual labour to one dominated by industry and machine manufacture. The development of steel, electrical, petroleum and chemical industries, and mass production of consumer goods contributed to economic growth and improvement of the standard of living. The technological development of the twentieth century leading to the production of nuclear power and exploration of space, despite the debate over its dangers and benefits, has advanced scientific knowledge and human progress. Research and development in electronics, computers and communication technologies, molecular biology and biotechnology have opened new horizons for social and economic progress and well being of mankind.

Science and technology play a crucial role for sustainable development. The UN Conference on Environment and Development (Rio de Janeiro, 1992) underlined the use of the sciences in supporting the management of the environment and development for the daily survival and future development of humanity. It recommended that one role of the sciences should be to provide information to better enable formulation and selection of environment and development policies in the decision-making process. In order to fulfil this requirement, it will be essential to enhance scientific understanding, improve long-term scientific assessments, strengthen scientific capacities in all countries and ensure that the sciences are responsive to emerging needs

The industrialized countries have invested in, and benefited from, science and technology by capacity building, research and development. The application of science and technology in the developing countries, and international cooperation in this field, stimulated economic growth, improved agriculture, health and the standard of living of people. The 'green revolution' is an example of how science and technology contributed to improvements in food production. In the 1960s, a Mexican scientist developed improved strains of wheat, rice, maize and other cereals which increased the crop yield. The result of this scientific experiment was so significant that Mexico which imported half its wheat, not only became self-sufficient, but also by 1964, it was exporting half a million tons of wheat. This scientific process was applied in India, Pakistan, Philippines, Sri-Lanka and other developing countries. The agricultural output of the farms in these countries was significantly improved.

The application of biotechnology is important for agriculture, food science and medicine. The United Nations Food and Agricultural Organization (FAO), in a statement published in March 2000, underlined the importance of biotechnology in the following terms: 'Biotechnology provides powerful tools for sustainable development of agriculture, fisheries and forestry, as well as for the food industry. When appropriately integrated with other technologies for the production of food, agricultural products and services, biotechnology can be of significant assistance in meeting the needs of an expanding and increasingly urbanized population in the next millennium.' According to the World Bank, biotechnology could boost food productivity in the developing world by 25 %, feeding more people while consuming fewer resources. In the field of medicine, the principles of biotechnology are being applied for the diagnosis and therapy of human diseases. Genetic research studies are expected to make significant contribution to discoveries on the causes, prevention and treatment of major chronic diseases. While there is little doubt about the potential of biotechnology for food production and health, genetically modified organisms have become the subject of intensive debate.

Another important technological development of the twentieth century has been the digital electronic computer and the development of transmission technologies. The digital revolution has had a profound impact on trade, industry, banking, media, communication, management and the service sector, especially in industrialized countries. It has contributed to globalisation, outsourcing and economic development. The internet opened new avenues for communication and information sharing, at negligible cost, compared to any previous communication technology. The ability to easily and rapidly share information on a global scale brought new opportunities for cooperation in training, research and business. The rapid developments in new technologies are a challenge for the developing countries to strengthen their capacities in science and technology. Otherwise the economic gap between the rich and poor countries will become wider.

A number of developing countries have established significant infrastructure and scientific base and invested in training and research and development closely linked with manufacturing, industry and the service sector. As a result of increased scientific and technological capacity, coupled with more progressive and liberal development policies, these countries have witnessed significant economic growth. With the application of new technologies and development of knowledge-based economies, the development pattern is changing. The contribution of industry and the service sector in the gross domestic product is increasing, while the proportion of GDP for agriculture has been reduced. A trend has developed that instead of creating capital-intensive industrial sectors, which provides limited employment, attention is given to economic development programmes that aim to utilize science and technology and the specific resources and natural advantages of developing countries.

How do we measure scientific and technological activity? Science and technology systems are complex, but decision makers need to make choices on the basis of reliable indicators. The World Science



Report, published by UNESCO, provides an overview of scientific and technological activity worldwide by analysing a number of science and technology indicators. Science and technology indicators are a key element by means of which countries and regions can be evaluated and compared. Research and development expenditures and their relationship to gross domestic product is one indicator. Scientific output is assessed using the twin indicators of evolution in scientific publication and world ranking by scientific discipline; technological output is measured by the number of patents registered in both the US and European patenting system. It has been pointed out that these indicators are limited in scope, as they are not linked to any social, cultural or economic purpose, such as their contribution to higher education, implications for industrial competitiveness, the dissemination of technology and its impact on living conditions or the environmental situation.

The World Science Report 2005 shows that 77.8 % of the world's expenditure on research and development takes place in developed countries. The proportion of the world's gross domestic product (GDP) in these countries is 59.4 %, while their population is 19.3 % of the world population. The average expenditure in research and development is 2.3 % of GDP in developed countries, leading by Japan (3.1 %), USA (2.8 %) and Germany (2.5 %). The average expenditure on R & D in developing countries is 1.0 % of GDP. Among the developing countries in Asia, the expenditure on R & D as % of GDP in selected countries are as follows: China (1.2 %), India (1.1 %), Iran (0.5 %), and Pakistan (0.2 %). In general the economic growth rates in developing countries are positively correlated with national investment in education, training, research and development.

The most important issue for the developing countries is to have the political will to invest in education, science and technology as a means of promoting scientific culture and developing a critical mass of trained personnel for contribution to social and economic development. A science policy, based on national development goals, and appropriate strategies for training, research and

development in science and technology, will facilitate the application of science and technology in the development process. The promotion of basic education for all men and women and development of a comprehensive system of secondary, vocational and higher education will create the conditions for development of a scientific base. The integration of science and technology in social, economic and environmental programmes and projects at local, regional and national levels will contribute to sustainable development. International cooperation will save time and money (resources) for the application of science and technology in national development.

The situation in Afghanistan is unique. After more than two decades of conflict, resulting in the loss of the trained scientific personnel during the war or due to their departure and destruction of the infrastructure, the country has begun reconstruction and development. It will take some time until the country becomes self-sufficient. The building of basic infrastructure such as roads, schools, hospitals etc. has started. Significant efforts are made for the expansion of education at all levels. Special attention is given to the education of girls and women and a geographically balanced development of education. The present situation offers an opportunity to integrate and develop science and technology in the education system. A comprehensive policy to promote scientific culture through relevant formal and non-formal programmes will contribute to national development. Research and development, closely related to agriculture, health, industry and environment, will accelerate economic development of Afghanistan.

### **Science and Millennium Development Goals**

The 2005 World Summit reaffirmed the Millennium Declaration and underlined the importance of science and technology for development:

We recognize that science and technology, including information and communication technology, are vital for the achievement of the

development goals and that international support can help developing countries to benefit from technological advancements and enhance their productive capacity.

In the framework of strategies for achievement of millennium development goals, a UN Task Force on Science, Technology and Innovation (2005) made the following recommendations:

Developing countries will likely remain in poverty unless they can do what developed countries have done to achieve sustainable growth: incorporate science, technology and innovation into their economic strategies. Improve medicines, electronics and farming techniques – as a way to reduce poverty and human sufferings,

The countries need to initiate reviews of their educational systems to examine the degree to which they address the challenges of development. The review process should focus on the role of higher education in development and the place accorded to training in science, engineering, and technology within the higher education curricula.

Science, technology, and innovation policy cannot be viable unless it is underpinned by well-designed measures for addressing such issues as learning, research and development (R&D), and the diffusion, transfer, and commercialization of technology. This is particularly true in areas that have an impact on education, health, and environmental issues, areas such as agricultural and medical biotechnologies, pharmaceuticals, computer networks, and telecommunication systems.

The UN Task Force suggested that the first priority for developing countries is to build indigenous scientific and technological capacity, including research infrastructure, as part of the national planning strategies. It is through the existence of such capacity that long-term goals will be achieved; growth and problem solving will become indigenous and sustainable; and developing countries will

be able to manage the application of science and technology acquisition, absorption, and diffusion relevant to development

Advice on science, technology, and innovation needs to reach policymakers. For this to happen, an institutional framework needs to be created. Developing countries need to create and improve science and technology advisory institutions and structure at the national level.

Investment in science, technology, and innovation education has been one of the most critical sources of economic transformation in the newly industrial countries. It is important to increase investment in science and technology education.

Broadening access to science education for women is important. Educating women in the sciences is not simply a matter of meeting international obligations related to equality, it has a practical purpose of changing social attitudes and preparing the next generation to adapt to changing world conditions.

It is becoming evident that science education should be strengthened at the earliest level in educational systems. This will require greater emphasis on science education in primary schools. Science, technology, and innovation education at the secondary and tertiary levels are critical to creating an innovative society.

Information and communication technologies (ICT) can increase primary, secondary, and tertiary education by facilitating distance learning, providing remote access to educational resources, and enabling other solutions.

Vocational and polytechnic institutes in developing countries are very important. Technologists, technicians, and craftspeople are the bedrock on which small and medium-size enterprises are founded, especially in operations and maintenance.

Higher education is increasingly being recognized as a critical aspect of the development process, especially with the growing awareness of the role of science, technology, and innovation in economic renewal. Today's economic circumstances make higher education a more compelling need in developing countries than it has ever been.

## **Science and Technology in Afghanistan**

### University Institutions

In 2003, out of a total enrolment of 31,200 university students, 14,973 male and 2,053 female students were enrolled in 43 scientific and technological faculties at 16 universities in Afghanistan. A further 2,981 students including 594 female students were enrolled in 5 faculties of economics and 7 faculties of social sciences. The distribution of students, according to the fields of study, are as follows:

6,195 students including 1,127 female students in seven Faculties of Medicine and one Faculty of Curative Medicine

287 male and 42 female students at the Faculty of Pharmacy

3,000 students including 702 female students in ten Faculties of Science and one Faculty of Geology

3,524 students including 37 female students in eight Faculties of Agriculture and two Faculties of Veterinary Science

3,978 students including 145 female students in nine Faculties of Engineering

1,750 students including 134 female students in five Faculties of Economics

1,231 students including 460 female students in seven Faculties of Social Sciences

The government intends to enrol 100,000 students in the universities by 2010. It is expected that over 60 % of the students will be in the faculties of agriculture, medicine, science, engineering, economics and management.

### Research and development

The institutions of higher education are in the process of rehabilitation and development. Currently there are no graduate training programmes and consequently the research activities at universities are very limited. The Academy of Sciences was set up in 1981, by regrouping a number of Afghanistan's research institutes and centres concerned with Afghan languages, literature and history. The Academy is an autonomous organization with five major departments: Islamic studies; Language and Literature; International Centre of Pashto studies; Social Sciences; and Natural Sciences. The Academy had 550 posts for research and supporting staff in 2004. In view of the shortage of staff and lack of adequate laboratories and other facilities, at the present time, very little research is carried out in the field of science and technology.

### Technical and vocational training

In 2004/2005, there were 24 technical and vocational institutions in Kabul and 17 institutions in the provinces, with a total enrolment of approximately 4870 students. These schools provide training in the following areas: technical (25), agricultural (11), business administration (5). There are 9 post-secondary technical schools, 31 secondary vocational schools and one middle level school. Three schools are specialized institutions operated by the ministries responsible for telecommunications, power and energy, and the transport sectors. The government plans to expand formal and non-formal technical and vocational education and training rapidly in order to meet the millennium development goals of the country. The

plan envisages the training of 150,000 men and women in marketable skills through public and private means by 2010.

### **National Capacity Building**

The goal of the economic and social development strategy is to create an enabling environment for growth in agriculture, rural development and other areas. The government will enhance the economic growth by investing, and encouraging the private sector, in development of (1) infrastructure, (2) institutional and human capacity building.

The Infrastructure goals will be achieved through programmes in roads and transport including air transport, energy and water; telecommunications; natural resources and mining; and urban development and housing. Institutional and human capacity building will aim at improving the capacity of the public and private sectors and developing the health, education and skills of the economically active population.

The government intends to integrate sustainable development approaches into the national development framework; environmental legislation and the regulatory framework is underdeveloped; public awareness of environmental and natural resource issues is limited. The government will (1) strengthen the capacity of National Environmental Protection Agency (2) develop and implement a legal and regulatory framework that ensures sustainable use of natural resources (3) build environment and natural resource management capacity (4) initiate community-based management of natural resources (5) introduce environmental education and vocational training and (6) promote regional cooperation on environmental and natural resource management.

How can science and technology contribute to achieve the social, economic and environmental development goals of Afghanistan?

The National Development Strategy envisages significant development of basic education, secondary and higher education and vocational training. It is important to ensure the relevance and quality of education and training, responsive to the environment and development needs of Afghan society. In particular the scientific elements of the education system need to be improved. Attention should be given to the development of appropriate curricula, teaching and learning materials, laboratories and practical training, and teacher education in science and technology. Secondary schools should provide practical work and vocational options, linked with development needs of the community. The teaching of integrated science and technology will make education more relevant to development needs. The teaching and application of new technologies, including computers in schools, will broaden access to education, improve the quality of learning, and equip students with an essential tool for learning and work.

The institutions of higher education in different fields of science and technology including basic sciences, engineering, agriculture, medicine, geology and mining, economics etc. should be modernized and developed. The current enrolment of 40,000 students in universities will be increased to 100,000 by 2010. In order to meet the reconstruction and development needs of Afghanistan, the student enrolment should be significantly increased in favour of basic sciences, agriculture, engineering, medicine and management. The renewal of study programmes, modern laboratory and workshop facilities, and staff development will be required for improvement of the quality of higher education. Pooling of intellectual, technical and material resources and coordination among universities will improve the efficiency of the system.

The role of the university in the development process should be reviewed. Cooperation between universities and business and industry and local communities will make the study and training



programmes relevant to development needs of Afghan Society. The university study programmes should include practical training in industry, agricultural extension centres, and social and community services. Appropriate research and studies linked with field work should be envisaged during the last year of study programmes in science and technology. Research and development will contribute to economic growth and sustainable development. Consideration should be given to the establishment of a graduate study programme (initially for a Master's degree) in selected fields, most relevant to the needs of the country such as agriculture, engineering, health and environment. Such a programme could be developed in cooperation with appropriate international scientific centres or through affiliation with foreign universities.

The proposal to train 150,000 men and women in marketable skills through public and private means by 2010 is important for the achievement of the millennium development goals. Current enrolment in vocational schools of the ministry of education is 4,700 students. In addition there are a number of trainees enrolled in vocational schools and centres operated by other ministries. To train a much larger number of men and women over the next five years requires substantial capacity building. It means workshop facilities, training materials and especially instructors. The planning and development of necessary infrastructure, as well as decentralization of the operation to provincial and community level, is an urgent task. Provincial committees could help in assessing local needs, mobilizing resources and coordination between formal and non-formal training. Flexibility in the duration of training and methodology (modular training, apprenticeship schemes, school-based training or a combination of these methods) will be necessary. In every province, at least one institution should be designated or established to provide professional and technical support to the training centres.

Coordination at the national level among various ministries and with the private sector will be essential. A division of work in vocational education and training between the ministry of education, ministry

of social affairs (non-formal training), ministry of higher education (community colleges), ministry of rural development, ministry of agriculture and other government agencies will clarify the role and responsibility of each ministry for the training of 150,000 men and women. The participation of the private sector and communities will be an important element of the national training programme. It may be necessary to consider the setting up of a national agency or a coordinating mechanism for planning, financing, general guidance on needs assessment, standards, evaluation and certification of the training programmes. A national project on distance learning should be developed especially for the training of vocational instructors. A vocational guidance programme needs to be developed, self-employment and entrepreneurial work encouraged. In this regard, the government could provide guidance, basic tools and loans for skilled workers, craftsmen and craftswomen.

The UN Task Force on Science, Technology and Innovation underlines the importance of advice on science and technology to decision-makers. It recommends that developing countries need to create and improve science and technology advisory structure and institutions at the national level; it adds that the first priority will be to build indigenous scientific and technological capacity, including research infrastructure, as part of the national development planning strategy. It should be recognized that science and technology concern all sectors and several ministries and government agencies, as well as the private sector. In Afghanistan the Ministry of Higher Education and the universities are training doctors, engineers and development specialists. The Ministry of Education and several other ministries are training technicians and skilled workers. The application of science and technology for reconstruction and development of the country cannot be undertaken on an ad hoc basis. There is a need for a coherent long-term science and technology policy for training, research and development.

In view of the importance of science and technology for sustainable development, it is proposed that a national policy and long-term strategic plan for capacity building in science and technology be

prepared for the reconstruction and development of Afghanistan. The plan should take into account the potential of science and technology as a means of accelerating the development process; it should cover the modernization of agriculture, management of the environment and water resources, improvement of transport and communication infrastructure, production of energy, and expansion of crafts and industries. The elements of a national policy for the application of science and technology should include science education and the popularisation of science, infrastructure for the training of scientists, engineers and technologists, information technologies and the promotion of research and development. A national infrastructure for policy formulation and promotion of science and technology will contribute to development.

## **Science Policy for Afghanistan**

Science and technology have played an important role in the social and economic development of industrialized and developing countries. Scientific knowledge and its technological applications are expanding rapidly. Development of national science and technology capacity including the ability for transfer, adaptation and utilization of new technologies contribute to economic growth. The elaboration of a national policy for science and technology and establishment of modern infrastructure, programmes and projects for education, training and research are essential elements of a strategy for development. It should be recognized that developing a national scientific base, carrying out research and exploiting its results are long term endeavours, which require planning, sustained efforts and investment. Industrialized countries spend about 2-3 % of their GNP for research and development in science and technology. Many developing countries with rapid economic growth have invested in science and technology. Capacity building in science and technology is not a luxury but an absolute necessity for sustainable development.

For the application of science and technology to development needs of Afghanistan, consideration should be given to the formulation of national policy and preparation of a long-term strategic plan for capacity building. Appropriate policy and programmes for training and research in science and technology would contribute to the reconstruction of the country, stimulate long-term economic growth and modernization, reduce poverty and improve the standard of living of Afghan people. The objectives and strategies for the development of science and technology should be based on national priorities, taking into account both short-term and long-term needs of the country. In building national capacity for science and technology, special attention should be given to the following: (a) Mobilizing national and international expertise and resources including Afghan specialists and entrepreneurs outside the country

(b) Creating a conducive climate for research and development (c) Investing in formal and non-formal education at all levels - basic, secondary, technical and vocational and higher education and (d) Promoting the participation of the private sector in the application of science and technology.

## **Objectives**

Application of science and technology for the reconstruction and development of Afghanistan

Capacity building in human resources for enhancing agriculture and food production, health and medical services, management of natural resources and protection of the environment, communication infrastructure, production of energy, exploitation of mines, development of industry and transfer of technology

Building capability for research and development and promoting creativity and innovation in enterprises, crafts and industry.

Promotion of the teaching of science and technology as an integral part of general education and acquisition of basic knowledge and as a means of nurturing in young people scientific thought, observation, experimentation and innovation

Popularisation of science and technology to enhance public understanding of their impact on daily life and progress in society

## **Policy Guidelines**

Establish a national infrastructure for science and technology policy and develop a long- term strategic plan for capacity building

Identify national goals and priorities for science and technology, based on the analysis of social and economic sectors and national development plans

Mobilize public and private technical and financial resources for the development of science and technology, and create a conducive environment and incentives for promotion of research and development

Increase investment in education and training, and relevant research and development especially in priority areas such as health, agriculture, environment, mines and industry.

Enhance the quality of higher education in science and technology by modernizing the curriculum, organizing programmes for faculty development and provision of adequate laboratories including new technologies

Develop graduate training and applied research in agriculture, health, engineering, management and exploitation of natural resources, environment and development studies in cooperation with appropriate regional and international institutions

Incorporate research and development as a component of major technical and commercial projects undertaken by ministries and government agencies

Application of information and communication technologies (ICT) in education and training, research and development, business, industry and management

Establish a national information system for science and technology and electronic connection with relevant international libraries and documentation centres

Intensify the teaching of international languages especially English for acquisition of scientific knowledge and transfer of technology

Foster international cooperation for enhancing national capacity in science and technology

## **Elements of Strategies**

### **1. Governance and Management**

The application of science and technology to development needs of Afghanistan concern all ministries and government agencies as well as the private sector. The Ministry of Higher Education, the universities and the Ministry of Education are particularly responsible for education and training. The institutions of higher education and the academy of science should develop their research activities in science and technology, in cooperation with relevant agencies and enterprises. A national structure for promotion, coordination and funding of research and development should be considered. Measures need to be taken for provision of incentives for researchers and inventors, protection of intellectual property and financial support for innovations in small and medium-size enterprises (SME). On the basis of national strategies, research and development plans should be prepared by sector and sub-sector; the execution of research activities could be decentralized. The optimisation and concentration of intellectual resources and enhancement of the management capability of each sector and sub-sector for research and development should be considered. For improvement of governance and management of research, the following is proposed.

#### **a. National Council for Science and Technology**

The establishment of a National Council for promotion and development of science and technology in Afghanistan should be considered. The objective of the Council would be to prepare a national policy for science and technology and recommend priority projects for application in social and economic development of

Afghanistan. The Council could be composed of senior officials of the relevant ministries and agencies, key specialists in science, technology and development from higher education institutions and the academy of science and representatives of the private sector (business, industry, communication, agriculture etc.). The President of the State should appoint the Chairman of the Council for Science and Technology.

#### b. Science and Technology Committees

Science and Technology Committees should be established for different sectors and sub-sectors (agriculture, health, education, industry, communication, commerce, natural resources, environment etc.) and basic sciences. The Science and Technology Committees would bring together specialists from universities, the academy of science, ministries, agencies and the private sector to advise the National Council for Science and Technology on the research and development needs of respective sectors or sub-sectors. These Committees could also facilitate the coordination of research and development activities among the specialists in the same field and between university institutions, the academy of science and specialized laboratories. The Committees would contribute to the enhancement of research and experimental activities in various specialized fields of science and technology.

#### c. Management of Research

All ministries and government agencies should develop a capacity for managing research and development in the application of science and technology for modernization and enhancement of their sector or sub-sector. For this purpose, measures should be taken for the establishment of appropriate structure and provision of personnel in each ministry and government agency.



## **2. Education and Training**

### **a. Science and Technology Education**

The teaching of science and technology should be an integral part of general education in primary and secondary schools. The training of science teachers, provision of laboratories and relevant textbooks for schools should be given priority. The curricula and methods of science teaching should be modernized. The Science Centre of the Ministry of Education should be further developed. All faculties of education and teacher training colleges should have adequate laboratories, textbooks, scientific journals, reference libraries and access to the Internet.

### **b. Popularisation of Science**

Programmes for popularisation of science and technology for children and young people as well as adults should be developed through science literacy and skills training courses and the mass media (radio and television). Measures should be taken for publication of reading materials for public understanding of science and technology and their impact on daily life including nutrition, health and family. A National Science Museum should be established and mobile exhibitions on the application of science and technology to progress and development should be organized.

### **c. Promotion of scientific talent**

Programmes should be initiated in schools and training institutions to promote scientific studies and creativity among students (boys and girls) and encourage independent experimental and innovative projects and field work in science and technology. Olympiads in basic sciences and mathematics should be organized. Local, regional and national competition in development and adaptation of technology could be organized. The setting up of science clubs should be supported. Talented science students should be identified

and guided to pursue scientific studies. Measures for giving recognition to scientific talent and creativity should be considered.

#### d. Training of Technicians

In order to train the technicians needed for social and economic development, measures need to be taken to expand technical and vocational education at secondary and post-secondary level and community colleges. Studies should be carried out to determine the level and type of technicians required for different sectors of the economy. The technical schools and training centres need specialized teachers and appropriate curricula and learning materials for a variety of courses. Adequate workshops and training facilities need to be developed. Measures should be taken to coordinate with industry and enterprises to ensure the quality, relevance and efficiency of the training programme. A National Institute for development of programmes and professional services for technical and vocational education and training should be established.

#### e. Training of specialists and engineers

Manpower studies should be undertaken to determine the number and qualification of technical and scientific personnel required by public and private sectors for development of Afghanistan. The training programmes in basic sciences and mathematics, agriculture and animal husbandry, natural resources and environmental studies, engineering and new technologies, geology and mining, economics and management should be reviewed by committees of experts to ensure their relevance, in terms of quality and quantity to the current and future needs of the country. Steps should be taken to diversify the programmes and expand the training capacity. Priority should be given to provision of modern equipment for basic science laboratories and engineering workshops, application of new information and communication technologies and establishment of a comprehensive scheme for staff development. Provision of international scientific journals, reference materials and libraries including access to the internet and understanding of the English

language will be indispensable for the quality of training in science and technology. Cooperation for training and research with relevant centres and institutions abroad should be developed.

#### f. Graduate Training Programmes

As a long-term strategy, consideration should be given to the development of centres of excellence in universities and specialized national laboratories, where advanced studies and research can be pursued, in accordance with the development needs of Afghanistan. A graduate training programme should be initiated in certain areas such as basic sciences, engineering, management of natural resources, agriculture, economics and development studies. In view of the present shortage of Afghan faculty with advanced degrees in science and technology, a pilot graduate programme should be developed in cooperation with one or more appropriate foreign universities. A project for modernizing the curriculum and preparing a programme for the M.Sc. Degree, provision of laboratory facilities and training of Afghan faculty should be envisaged, with bilateral and multilateral financial and technical assistance. Applied research and field work should be a requirement of the graduate training programmes.

### **3. Research and Development**

#### a. National Research Centre

Consideration should be given to the establishment of a National Centre for Applied Research in Science and Technology, which could work closely with university institutions. The programme of the Centre would be based on the research needs of various technical ministries and agencies, development projects and the private sector. The objectives of the Centre might include the following:

- Prepare studies and proposals on policy and programmes

for application of science and technology to development needs of Afghanistan.

- Studies on social and economic aspects of the application of science and technology for development.
- Studies of natural resources including water and forests, with a view to their efficient exploitation.
- Ecological studies for the preservation and improvement of the environment including the urban system.
- Research for improvement of agriculture and animal husbandry.
- Research on public health and prevention of common diseases.
- Experiment to improve technologies and materials for farming, construction, handicrafts, water and sanitation, transport, household application (cooking, heating, food and energy conservation) etc.
- Applied research related to mining, petroleum, gas and relevant chemical industries.
- Research and studies for improvement and development of industries (manufacturing, textile, medicines, cement, sugar, vegetable oil etc.).
- Research and studies for major construction and development projects.
- Application of modern technologies to the development needs of Afghanistan.
- Publication of a Journal on application of science and technology for development.

## b. Institute of Health Technology

In addition to reinforcing the Faculties of Medicine and the Faculty of Pharmacy, a National Institute of Health Technology should be organized for medical research and training of all categories of personnel for health science. The Institute could be organized in Kabul with branches in different regions of the country, and it should be associated with relevant universities. The Institute should cooperate with the Faculties of Medicine and their hospitals in joint research projects and training. The Institute could carry out research in public health, prevention of common diseases, studies of regional health problems, pharmacology etc. It will also contribute to the training of health personnel for primary, secondary and tertiary health care including supervisory professionals, physicians' assistants, nurses, technicians etc.

## c. Institute of Environmental Studies

It is proposed to establish an interdisciplinary Institute for Research and Training in Environmental Sciences. The Institute could be attached to the University of Kabul and work closely with the National Environmental Protection Agency. The Institute should promote sound environmental practices and undertake applied research and studies for the sustainable development of Afghanistan. It should train specialists and technicians for environmental control and management. The Institute should carry out its tasks in collaboration with relevant university faculties in both natural and social sciences. The work plan should be prepared in consultation with all relevant government departments and the private sector and include areas such as management of the ecosystem and natural resources, protection of biodiversity, community-based management of land, forests and water resources, pollution control in industry, towns and villages, improvement of health and sanitation, development of renewable energy sources etc.

#### d. National Laboratories

In the context of a long-term plan, a number of specialized laboratories for research and pilot projects related to priority areas for economic development should be established. These research and development laboratories may be considered in the following areas: agriculture and food products, exploitation of natural resources including important mines and petroleum, industry and consumer products, construction technology and materials, water and energy, improvement of the environment etc. The specialized laboratories should work closely with relevant ministries and agencies and keep them informed about new developments in science and technology and their potential for application to the needs of Afghanistan. The laboratories should also cooperate with the institutions of higher education in providing research and training opportunities for Afghan students and researchers. Initially, international technical assistance would be required for development of the specialized national laboratories and training of their research staff.

### **4. Infrastructure and Materials**

#### a. New Technologies (ICT)

New information and communication technologies are important for education and training, research and development, planning and administration, management of human resources and institutions, business and industry. Steps should be taken for the application of new technologies to development needs of Afghanistan. The education strategies should include development of computer education in schools and higher education and access to the Internet. Appropriate infrastructure for planning, coordination and development of computer education as well as studies in computer science and engineering should be established. In addition to acquisition of necessary computers and software, it is essential to train the teachers, computer programmers, and technicians for

maintenance and repair of computers. The setting up of a National Centre for Information and Communication Technologies should be considered in order to coordinate the development of ICT, establish standards for computer hardware and software, facilitate connection to the Internet, organize training for government employees and provide advisory services in this field.

#### b. Science and Technology Parks

As a long-term strategy science and technology parks should be established close to university centres. A science park can play a key role in promoting and nurturing the application of science and technology. It promotes research and development and innovations. It is an economic and technological development structure that aims to foster the development and application of technology to industry. It consists of research facilities, laboratories, business incubator as well as training. Science parks promote research and development by the university in partnership with small and medium sized industries. The activities would be based on national and regional economic development priorities and could cover areas such as food industries, biotechnology, pharmaceutical industry, manufacturing, electronics, energy and environment etc. Science and technology parks stimulate the flow of knowledge and technology amongst universities, research and development institutions, companies and markets.

#### c. Science and Technology Centres

In order to promote public understanding of science and technology and its application to daily life and work, especially in relation to nutrition and health, local crafts and industry and protection of the environment, it is proposed to establish regional science and technology centres. These centres could be attached to universities or other appropriate institutions and carry out the following functions:

- Prepare programmes for the mass media on science and

society issues relevant to the needs of local communities and villages.

- Promote programmes of environmental information and education for the general public.
- Provide advisory services to local communities and projects on the use of appropriate technologies for crafts and industry.
- Promote science and technology activities for young people through experimental projects, scientific competitions, organization of meetings and local science clubs, and relevant fieldwork.
- Carry out studies of regional and local interest on application of science and technology to development.

#### d. National Documentation Centre

A national centre for information and documentation in science and technology should be developed to collect information on projects, institutions and human resources, create databases relevant to development needs, facilitate access, retrieval and exchange of information, and provide Internet connection to other information systems. Afghan scientists and technologists need to have access to relevant research findings, reference materials and databases. A digital library should be established to facilitate access to international publications in science and technology.

#### e. Financing Science and Technology

Capacity building in science and technology requires investment. Studies have shown that investment in appropriate science and technology contributes to economic growth. The State budget should give priority to the development of science and technology. The role of the private sector in the application of science and technology for modernization of industry, development of agriculture, improvement and expansion of the service sector will be significant. The government should encourage the development of science and technology in the private sector and provide incentive



for promotion of research and development. The strategies should carefully consider the most relevant, economical and efficient ways and means of the application of science technology in the reconstruction and development of Afghanistan. Research and development, adaptation of foreign technology to national needs and efficient training systems would make the application of science and technology cost-effective. National and international expertise and resources, including Afghan specialists and entrepreneurs outside the country, need to be mobilized. It is necessary to make a substantial investment in developing education and training in science and technology. The establishment of a Foundation for funding Research and Development in science and technology should be considered.

#### f. International Cooperation

Bilateral and multilateral cooperation and technical assistance (equipment, expertise and training fellowships) will be essential for development of science and technology in Afghanistan. Regional and international cooperation in the field of science and technology can be reinforced through exchange of information and experiences, participation in relevant networks of universities and science and technology institutions, joint research and development projects and partnership in the application of science and technology to specific economic development projects. Consideration should be given to formal cooperation schemes between Afghan scientific institutions and appropriate centres abroad. The knowledge of international languages especially English will be indispensable for effective communication with foreign partners. An intensive programme of teaching English and other major international languages should be envisaged for Afghan researchers, specialists, managers and entrepreneurs.

## **National Council for Science and Technology**

The National Council will be an autonomous body with the objective of advising the government on science and technology policy for sustainable development. The members of the Council will be appointed by the government and consist of senior officials of relevant ministries and agencies, representatives of the scientific community and the private sector. The Council will prepare a national science and technology policy and a long term strategic plan, and promote the application of science and technology in social and economic development of Afghanistan. In particular, the National Council will undertake the following:

- Formulate a science and technology policy for approval of the government.
- Prepare a strategic long-term plan for application of science and technology in social and economic development.
- Assist ministries and government agencies in preparing specific plans and projects for application of science and technology in their sector and sub-sector.
- Prepare laws and regulations for protection of intellectual property and provision of incentives for researchers and innovators.
- Provide consulting services to the private sector for the application of science and technology, especially in connection with innovations in small and medium-size enterprises.
- Establish a national centre for research and development and other appropriate infrastructure and national laboratories, as approved by the government.

- Coordinate applied research and development in science and technology, and disseminate the results of such research, as appropriate.
- Establish a national centre for application of information and communication technologies to development needs of the public and private sectors.
- Establish cooperation with relevant scientific institutions and organizations abroad.
- Establish a national documentation centre for science and technology and a digital library.
- In cooperation with the private sector and universities, support the setting up of science and technology parks.
- Promote research and development in the private sector, through funding and technical services.
- Promote science and society programmes and projects through the media (TV and radio), publications, conferences, organization of an annual science week and establishment of a science museum.
- Promote scientific talent by organizing science Olympiads and technology competition at local, regional and national level, and supporting the training of young scientists.
- Promote innovations in crafts and industry, and adaptation of technology to local social and economic projects.
- Establish a Foundation for Research and Development in science and technology.

## **Organization**

### The Council

The National Council for Science and Technology will consist of a chairman, members, scientific committees and the secretariat. The President of the State will appoint Chairman of the Council. Members of the Council will be deputy ministers or senior officials from the relevant ministries and agencies (higher education, education, agriculture, health, mines and industry, communication, public works, transport, rural development, environment, economy etc.), chairpersons of the scientific committees, and selected representatives of the private economic sector. The Council will prepare and recommend to the government a national policy and strategic plans for the application of science and technology in social and economic development of Afghanistan.

### Scientific Committees

Scientific Committees will be established for each sector and sub-sector. Members of the scientific committees will be selected from among specialists in science, technology and development from public and private sector and will include, as associate members, appropriate international cooperating specialists and researchers. The Scientific Committees advise the Council on questions of policy, plans and projects in the application of science and technology and relevant research in each sector and sub-sector. The Scientific Committees will elect their own chairpersons. Scientific Committees may be considered for the following areas: basic sciences, agriculture, water, industry, energy, geology and mining, engineering, technology, communication, transport, environment, health, education and training, and science and society.

### Executive Office

In order to support the objectives and programmes of the Council for Science and Technology, a number of technical and

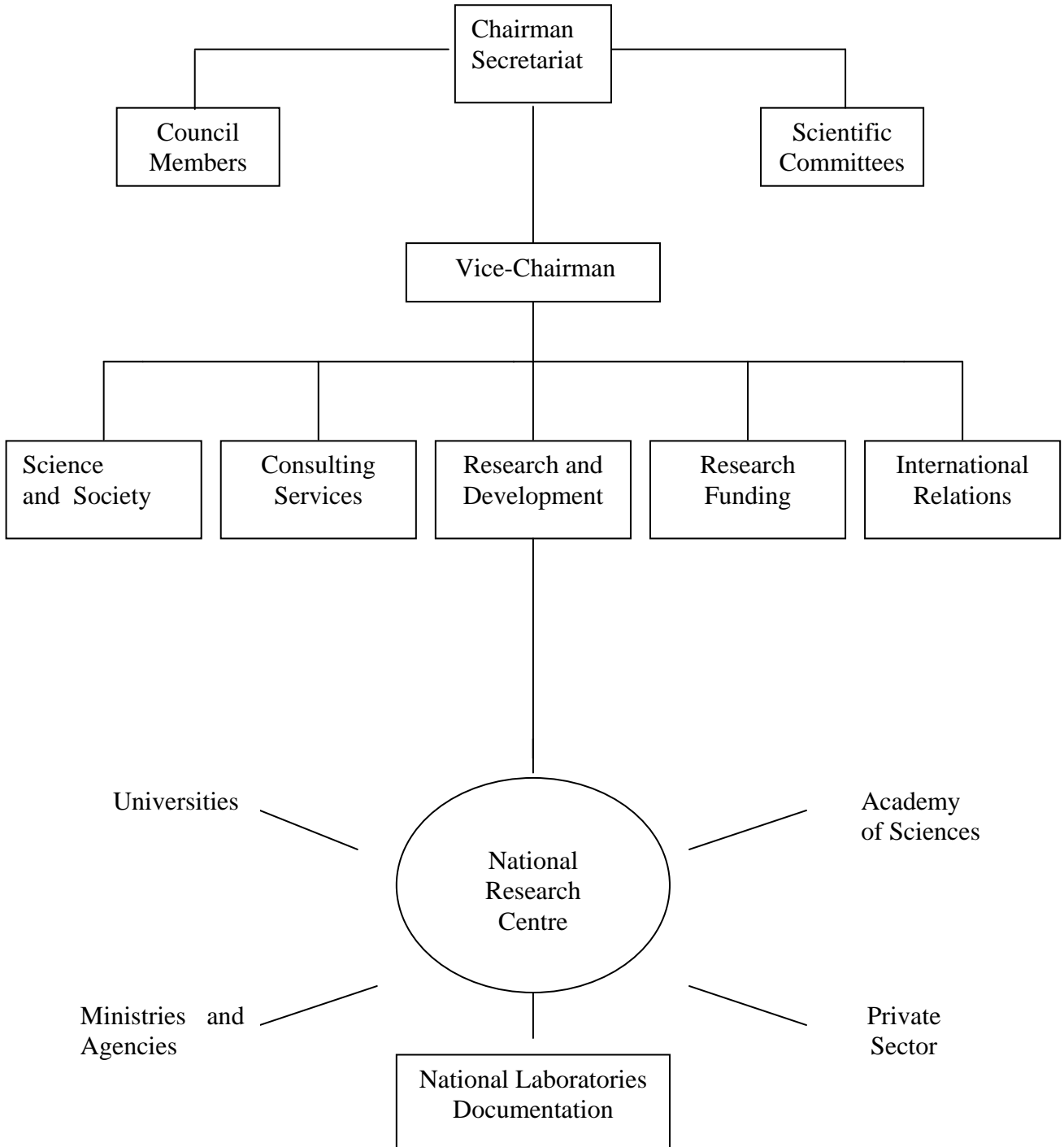
administrative units will be established. Under the authority of the Chairman of the Council, the Executive Vice-Chairman will be responsible for coordination and management of the functional departments and operational units of the Organization.

### Departments and Technical Units

The Council will establish the following Departments: (a) Research and Development (b) Science and Society (c) Consulting services (d) Research Funding (e) International Relations. The following supporting infrastructure will also be developed:

1. National Research Centre
2. National Laboratories
3. National Centre for ICT
4. National Documentation Centre
5. A Digital Library
6. A Science Museum

# National Council for Science and Technology



## **Annex**

### **Selected Bibliographic Sources**

The Constitution of Afghanistan (2004)

The National Development Strategy Documents,  
Government of Afghanistan, 2006

The Revival and Development of Education in  
Afghanistan, Report of the Independent High Commission  
for Education, 2003

Strategic Action Plan for Development of Higher  
Education in Afghanistan, Ministry of Higher Education,  
2004

Education and Afghan Society in the twentieth century,  
Saif R. Samady, UNESCO Education Sector, 2001

World Conference on Education for All (Jomtien, 1990),  
Report, UNESCO

World Education Forum (Dakar, 2000), Report, UNESCO

The Human Development Report 2005, UNDP, New York

United Nations Conference on Environment and  
Development (Rio de Janeiro, 1992), Report and Plan of  
Action (Agenda 21)

World Conference on Higher Education in the twenty-first  
century (Paris, 1998), Report, UNESCO

World Conference on Science for the twenty-first century:  
A New Commitment (Budapest, 1995), Report, UNESCO

World Summit on Sustainable Development (Johannesburg, 2002), Report, United Nations

Decade of Education for Sustainable Development: International Implementation Scheme, UNESCO, 2005

The Millennium Development Goals Report 2005, United Nations

Science, Technology and Innovation, Report of the UN Task Force, Millennium Project, 2005

Science and Technology Policy Review: Country Reports, United Nations Commission on Science and Technology, Geneva, 2004

Inventing a Better Future: A strategy for building worldwide capacities in science and technology, Inter-Academy Council, 2003

Handbook of Science and Technology Studies, Sheila Jasanoff, Gerald E. Markle, James Peterson, Trevor Pinch (Editors), Sage Publications Inc., USA, 2001

Science, Technology and Society in the third world, Wesley Shrum, Carl Bankstone, Stephen Voss, The Scarecrow Press Inc., London, 1995

World Science Report, UNESCO, 2005



