REPORT

PHOENIX

Research landscape in Central Asia

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PHOENIX

Fostering the rebirth of social sciences and humanities in the Central Asia

Specific Support Action

PHOENIX

SIXTH FRAMEWORK PROGRAMME

REPORT

Research landscape in Central Asia

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FINAL

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Introduction

The Central Asian countries (Kazakhstan, Uzbekistan, Kyrgyzstan, Tajikistan, and Turkmenistan) are strategically located at the crossroads of the ancient Silk Road between China, the Middle East and Europe. This area was for centuries one of the cradles of civilization. For almost four thousand years, the old *Silk Road* connected a dozen cultures and religious ideas, influencing major civilizations including Persia, India and China. The Silk Road not only connected East Asia with Central Asia and later to the Western world But also , via branch routes, opened up communication between China, India and Persia, and via northern routes trade and cultural contacts with Russia.

In the 19th century Russian, Chinese and British contests over control of Tibet, Persian and Central Asia became known as the *Great Game*. At the beginning of 20th Century it was realized once more, that the Eurasian heartland had great significance in world affairs. Geo-politician Nicholas Spykman formulated this idea more concretely - whoever controls the Rimland (the peripheral areas of the Eurasian continent) rules Eurasia; who rules Eurasia controls the destinies of the world. Today, some writers suggest that a new 'great game' isstirring among the major global players for influence.[1]

Several forums express the hope that following the independence of these countries, the 21st Century will see an era of renaissance in this region.

Today, the leading regional powers are closely following the Central Asian developments because of the geo-strategic significance of the region's oil, gas and other mineral riches. Central Asian countries joined the World Bank and the International Monetary Fund, acceded to the European Bank for Reconstruction and Development and joined the Asian Development Bank. They became members of NATO's North Atlantic Cooperation Council at the end of 1991, the Partnership for Peace in May-June 1994 (except Tajikistan), and the Euro-Atlantic Partnership Council in 1997. The EU has signed Partnership and Cooperation Agreements with all the Central Asian states except Tajikistan. All the countries are involved in the Commonwealth of Independent States, the Organization of the Islamic Conference, and the Economic Cooperation Organization[2].

At the end of 2001 Central Asia shifted rapidly from the periphery towards the centre of the United States global strategic interest.[3] These interests are primarily derived from Central Asia's proximity to Russia, Iran, and China. Furthermore it seems that Central Asia's importance to the United States is increasing. In 2004 Deputy Secretary of State Richard Armitage told Central Asians that "stability in the area is of paramount importance and vital national interest."[4] Meanwhile, a phenomenon common to all these countries is the influence of the Diasporas of Russians in the region.

Table. Distribution of Ethnic groups in Central Asia (%)[5]

Ethnic groups	KZ	KG	TJ	TM	UZ
Kazakh	53.4				3
Uzbek	2.5	13.8	15.3	5	80
Kyrgyz		64.9	1.1		
Tajik			79.9		5
Turkmen				85	
Russian	30	12.5	1.1	4	5.5
Ukrainian	3.7	1			
German	2.4				
Tatar	1.7				1.5
Uygur	1.4	1			
Dungan		1.1			
Karakalpak					2.5
Other	4.9	5.7	2.6	6	2.5

[1] *R. James Ferguson.* Geopolitics of the Silk Road: New Economic and Strategic Opportunities. *Eurasia, Lecture 10:2002. http://www.international-relations.com/wbeurasia/wblec10.htm 28.12.2007*

[2] MacFarlane, N. (2003). International organizations in Central Asia: Understanding the limits. Helsinki Monitor, 3, 287-299.

[3] Bohr, A. (2003). Regional cooperation in Central Asia: Mission Impossible? Helsinki Monitor, 3, 254-268.

[4] Blank, Stephen. U.S. Interests in Central Asia and Their Challenges. Demokratizatsiya; Summer2007, Vol. 15 Issue 3, p 312-334,

[5] CIA The 2008 World Factbook. Online version: https://www.cia.gov/library/publications/the-world-factbook/index.html

Key: KZ: Kazakhstan KG: Kyrgyzstan TJ: Tajikistan TM: Turkmenistan UZ: Uzbekistan

National identity and national language have been critical issues in the former Soviet Central Asian states both before and after independence. Ethnic and language borders commonly do not overlap with political borders – one third of peoples speaking Kazakh, Kyrgyz, Turkmen, and Uzbek live abroad[6]. Moreover about one million German speakers live in Kazakhstan and Kyrgyzstan and about five million Russian speaking people live in the Central Asian region. The use of Russian as the language of business, as a language of *"interethnic communication"* is a remnant of the Soviet period when the aim was to mix the nations and to create new type of 'national' species, s.c. *Homo Soveticus*. The majority of the Russian speaking population lives in urban areas.

The current demography common to all these countries is that of a 'young society' where almost 50% of the population is under the age of twenty-five. This is especially true in Tajikistan, which compared to other Central Asia countries has the highest rate of population growth. In 2001, the average age of the population was 22.8 years, and 46 % of the population is aged less than 16 years, i.e. a school age population[7].

Table. Distribution by age groups[8]

Age group/Country	KZ	KG	TJ	TM	UZ	*EE*	*FI*
0-14 years	22.5	30.3	35	34.7	32.4	*15*	*16.9*
15-64 years	69.2	63.5	61.2	60.9	62.8	*67.5*	*66.7*
65 years and over	8.3	6.2	3.8	4.4	4.8	*17.5*	*16.4*

Key: KZ: Kazakhstan KG: Kyrgyzstan TJ: Tajikistan TM: Turkmenistan UZ: Uzbekistan EE: Estonia FI: Finland

The trend of decreasing numbers of students in other CIS countries, 2-7% in 2004-2005, was reversed in Tajikistan where there was an increase of 1%.[9] A youthful population causes problems with the qualification of teachers. The proportion of all teachers with higher education is 80-87% in Azerbaijan, Armenia, Belorussia, Moldova, Russia, and the Ukraine, 71-75% in Georgia, Kazakhstan, Kyrgyzstan and only 59% in Tajikistan.[10]

National education policies are therefore critical for the development strategies of these countries. In this situation, aid offered by advanced countries was of vital necessity. Different support programs started their work in Central Asia: INTAS, ISCONIS, COPERNICUS, TACIS, SCOPES, Central Asia Research Initiative (CARI), IREX etc. Soon after independence, all five countries became Member States of UNESCO and established National Commissions for UNESCO.

At the same time, the region is extremely interesting from a historical and cultural point of view, and the forecast is that in the near future it will be a favourite tourist destination.

UNESCO, in cooperation with the Japanese Government, has launched several cultural heritage conservation projects along the Silk Roads. Two projects in China (the Longmen Grottoes and the Kumtra Thousand Caves), and three projects in Central Asia (the site of Fayaz Tepe in Uzbekistan, the Otrar project in Kazakhstan, and the Krasnaya Rechka, Chuy Valley sites project in Kyrgyzstan). The most recent approved project (April 2005) within this special UNESCO/Japan FIT Silk Roads programme was the preservation of the Buddhist Monastery of Ajina Tepe in Tajikistan. The World Heritage List includes 851 properties, of which 9 are situated in Central Asia.[11]

[6] Gordon, Raymond G., Jr. (ed.), 2005. Ethnologue: Languages of the World, Fifteenth edition. Dallas, Tex.: SIL International. Online version: http://www.ethnologue.com/

[7] State Statistical Committee, RT –6.2001, p.65-66

[8] CIA The 2008 World Factbook. Online version: https://www.cia.gov/library/publications/the-world-factbook/index.html

[9] Education in CIS countries, June 2005, CIS Statistical Committee, p.2

[10] ibid

[11] http://whc.unesco.org/en/statesparties/

Research & Development investment in human resources and Science & Technology

Since independence most of the Central Asian countries have experienced several economic reforms. As in all the former Soviet Union countries, their research systems have suffered huge losses. The number of researchers has declined by more than 50%. At the same time the percentage decrease in Research and Development (R&D) financing was even more substantial than the decline in the number of researchers and engineers[12]. The Central Asia research system during the Soviet time was dominated by Russian speaking researchers who had close contacts with different Russian research centres. A huge number of these researchers emigrated during the 1990s to Russia and to Western countries.

By now the R&D sectors all the Central Asia countries have greatly improved prospects**.** The human development index trends tell an important story in that aspect. All Central and Eastern Europe and the Commonwealth of Independent States (CIS), following a catastrophic decline in the first half of the 1990s, have recovered to the level before the reversal. Currently all Central Asia countries are modernising and reforming their research and education systems.

Table. Research & Development Indicators[13] [14] [15]

Indicators	KZ	KG	TJ	TM	UZ
Population	15,284,929	5,284,149	7,076,598	5,097,028	27,780,059
Total number of researchers 10382	10382	2187	4891	3488[16]	33614
Researchers per 1,000,000 inhabitants	679	414	691	684	1200
GDP (billions)	116€	7.1€	8.1€	32.27€	42.42€
Expenditure on R&D as % of GDP	0.28	0.2	0.1	n/a	n/a
GDP per capita	7,589€	1,344€	1,145€	6,331€	1,527€
HDI[17]	0.794	0.696	0.673	0.713	0.702

Key: KZ: Kazakhstan KG: Kyrgyzstan TJ: Tajikistan TM: Turkmenistan UZ: Uzbekistan

Despite the restrictions of tight budgets, all the Central Asian governments try to ensure that education receives a fair distribution of resources. The proportion of government spending in the region is as follows: 12.1% Kazakhstan; 18.6% Kyrgyzstan; 18% Tajikistan; 19.7% Turkmenistan and 17.8% Uzbekistan. Despite these figures, calculations show that with demographic factors taken into consideration, and in order to meet the minimal needs for maintenance and development of the education system, the average annual share of budget for education should be higher. This is especially the case in Tajikistan.

52% of Kazakhstan's and 41% of the Kyrgyzstan adult population are in tertiary education. For example, the total number of students in Kyrgyzstan, during 1994-2004 has increased by a factor of almost four. This increase has caused the problem of unemployment among graduates. In Kyrgyzstan, for example, the lowest enrolment is observed in the academic disciplines of pedagogy, humanities, agriculture and law. A deficiency of teachers does exist, but only in villages and mostly the result of low teaching salaries. The demand for manpower resources in rural agriculture areas has been sharply reduced and the demand throughout the Republic for lawyers has been cut by 22,000, which is the number being trained each year. Nevertheless, the population demand for education in these specialities does not fall.

[12] Egorov, I. (2002). Perspectives on the Scientific Systems of the Post-Soviet States: A Pessimistic View. Prometheus, 20 (1), 59-73.

[13] http://stats.uis.unesco.org/unesco/ReportFolders/ReportFolders.aspx

[14] http://hdr.undp.org/en/statistics/

[15] CIA The 2008 World Factbook. Online version: https://www.cia.gov/library/publications/the-world-factbook/index.html

[16] Data of 2004 y. Statistical Yearbook of Turkmenistan 2000-2004. Ashgabat,2005. Turkmen National Institute of State Statistic and Information.

[17] The HDI provides a composite measure of three dimensions of human development: living a long and healthy life (measured by life expectancy), being educated (measured by adult literacy and enrolment at the primary, secondary and tertiary level) and having a decent standard of living (measured by purchasing power parity,

The wages of researchers and university staff are low. The approximate monthly salaries in Kyrgyzstan, for example, are:

- $US50 - Doctor of sciences, Professor
- $US48 - Candidate of sciences, Professor
- $US33 - Candidate of sciences, Senior lecturer
- $US20 - Candidate of sciences, Assistant lecturer
- $US25 - Senior teacher
- $US22 - Teacher
- $US18 - Assistant teacher
- $US15 – Trainee teacher

By contrast the approximate monthly salaries in Kazakhstan[18] are:
- $US275 - Professor
- $US240 - Assistant Professor
- $US180 - Lecturer
- $US145 - Assistant Lecturer

The worst situation is in Tajikistan, where the approximate average monthly wages of researchers are $US27.

Because of low salaries, it is very common that R&D and university staffs are involved in informal business. A survey, conducted in Tajikistan, showed that 16.9% of research staff and 9.3% of health care workers have several jobs.[19]

Analysis by the Eurasia Foundation with financial support from United States Agency for International Development (USAID) in 2006 in Kyrgyzstan, showed that low salaries and benefits of university staff are for a base for abuse and academic dishonesty.[20]

Meanwhile, as all the Central Asian countries are aware of, and have discussed the situation, we may expect that the national governments can improve the living standards of university staff and researchers. Especially as all of the national governments have declared the importance of reforms.

[18] The system of higher education and educational standards in the Republic of Kazakhstan .Analytical Report. Moscow 2006

[19] Социально-экономическое положение Республики Таджикистан. Январь-апрель 2004 г.- Душанбе, 2004, С.62

[20] Report. Methodological basis for a comparative analysis of the quality of the educational process in business, econom ics, law and inform ation technology pro grams in higher education institutions of the Kyrgyz Republic. Bishkek: USAID, June 2006

Publication performance

The Central Asia research system during the Soviet period was dominated by Russian speaking researchers who had close contacts with different Russian research centres. A huge number of these researchers emigrated during the 1990s to Russia and to Western countries. In the Soviet Union republics, Russian was used as the "*lingua franca*", the language of scientific communication and the language that introduced research results to the world. Only limited number of researchers had an opportunity to communicate directly with colleagues abroad because of the Iron Curtain and for most of them the only opportunities to publish research results were the All Union scientific journals in Russian.

If we compare 1985 with 2007, we can see a vivid picture that reflects those developments which have taken place in Central Asia countries. A key change has been the move from the use of Russian to English in research papers. The change in the use of language indicates the impact of different Western support programs and governmental action plans to promote international cooperation (*Bolshak* in Kazakhstan, *Ustoz* in Uzbekistan). This does not mean that simultaneously there were draconian changes in the traditional collaboration partners.

Table. The number of papers of Central Asian researchers in the period 1996-2007 (ISI SCI)[21]

Country	Papers	Total Citations	Without self-citations	% of self-citations	Average citations	h-index[22]
TM	103	526	473	10.1	5.11	9
TJ	458	817	609	25.5	1.78	12
UZ	4395	10379	5912	43	2.36	33
KG	492	1433	1000	30.2	2.91	16
KZ	2659	7509	4822	35.8	2.82	30

Key: TM: Turkmenistan TJ: Tajikistan UZ: Uzbekistan KG: Kyrgyzstan KZ: Kazakhstan

Table. The number of papers of Central Asian researchers in the period 1996-2007 (ISI SSH, AHCI)

Country	Papers	Total Citations	Without self-citations	% of self-citations	Average	h-index
TM	8	10	10	0	1.25	2
TJ	16	13	13	0	0.81	2
UZ	56	62	54	12.9	1.11	5
KG	49	36	36	0	0.73	3
KZ	125	140	121	13.6	1.12	6

Key: TM: Turkmenistan TJ: Tajikistan UZ: Uzbekistan KG: Kyrgyzstan KZ: Kazakhstan

At the moment Central Asia is in the zone of Russia's interest and influence. This is because of historical traditions, geographical location and also because over 5 million Russian speakers live in these countries.

[21] ISI Thomson data derived from database in January 2008.

[22] The index is calculated based on the distribution of citations received by a given researcher's publications. A scholar with an index of *h* has published *h* papers with at least *h* citations each. Thus, the H-index is the result of the balance between the number of publications and the average citations per publication. The index is designed to improve upon simpler measures such as the total number of citations or publications, to distinguish truly influential scientists from those who simply publish many papers. The index is also not affected by single papers that have many citations. The index works properly only for comparing scientists working in the same field; citation conventions differ widely among different fields.

Table. Collaboration trends of Central Asia countries in 1996-2007 by publication performance in % (ISI SCI, 2008)

Country	TJ	TM	UZ	KG	KZ	Rank
Russia	47.4	42.7	10.2	22.2	21.2	1.
USA	3.5	5.8	6.8	13.8	12	2.
Germany	4.4	4.9	6.7	11.6	7.3	3.
Great Britain	2	6.8	2.3	3.5	11.4	4.
Uzbekistan	2.4	7.8		7.5	1.8	5.
Turkey	0.4	14.6	0.8	2.2	0.7	6.
Israel	0.7	7.8	1.1	1	4.3	7.
Poland	0.9	6.8	0.5	0.8	4.1	8.
Kazakhstan	2.2	5.8	1.1	3.9		9.
Japan	0.9	0	3.5	1.4	7	10.
France	0.9	1.9	2.7	3.3	2.4	11.
Italy	1.1	1	2.2	0.6	5	12.
Switzerland	1.8	2.9	0.5	2	1	13.
Kyrgystan	2	3.9	0.9		0.7	14.
Ukraine	0	2.9	1.6	0.4	1.9	15.
Belgium	0	1	1	2	2.8	16.
Korea (South)	0	0	2.1	0	4.1	17.
India	0.4	1.9	1.4	1.2	0.9	18.
Pakistan	2.2	1	0.3	0.8	0.6	19.
Iran	2.2	1.9	0.1	0.2	0.1	20.
SI	2.8	0	0.5	0	0	21.

Key: TM: Turkmenistan TJ: Tajikistan UZ: Uzbekistan KG: Kyrgyzstan KZ: Kazakhstan

Table. Collaboration trends of Central Asia countries, 1996-2007, by publication performance in % (ISI, SSCI and A&HCI, 2008)

Country	TJ	TM	UZ	KG	KZ	Rank
USA	15. 4	20	33. 3	38. 9	32. 8	1
Great Britain	30. 8	10	20	36. 8	24. 2	2
Russia	30. 8	0	5	2. 6	18. 75	3
China	23. 1	0	1. 6	8. 3	4. 7	4
Germany	0	10	6. 7	5. 6	10. 9	5
France	7. 7	10	3. 3	2. 6	3. 8	6
Kazakhstan	0	0	5	0	16. 4	7
Israel	7. 7	10	3. 3	0	0	8
Switzerland	0	0	3. 3	11. 1	3	9
Netherlands	0	10	1. 6	5. 3	0	10
Mexico	7. 7	0	0	8. 3	0	11
Japan	0	0	1. 6	2. 6	11. 7	12
Turkey	0	10	5	0	0	13
Uzbekistan	0	0	13. 3	0	1. 5	14
Italy	0	0	3. 3	0	9. 4	15
Canada	0	0	6. 7	2. 6	3	16
India	0	0	0	8. 3	3. 8	17
Turkmenistan	0	10	1. 6	0	0	18
Georgia	0	0	0	5. 6	5. 6	19
Norway	0	10	0	0	0. 8	20
Egypt	0	0	8. 3	0	1. 5	21
Belgium	0	0	1. 6	5. 6	2. 3	22
Ukraine	0	0	5	0	1. 5	23
Denmark	0	0	0	5. 6	0. 8	24
Finland	0	0	0	0	5. 5	25

Key: TM: Turkmenistan TJ: Tajikistan UZ: Uzbekistan KG: Kyrgyzstan KZ: Kazakhstan

Figure. Top 15 co-authors – KAZAKHSTAN
(Total co-autors from 67 countries, selected 15 countries constitute 84,1%)

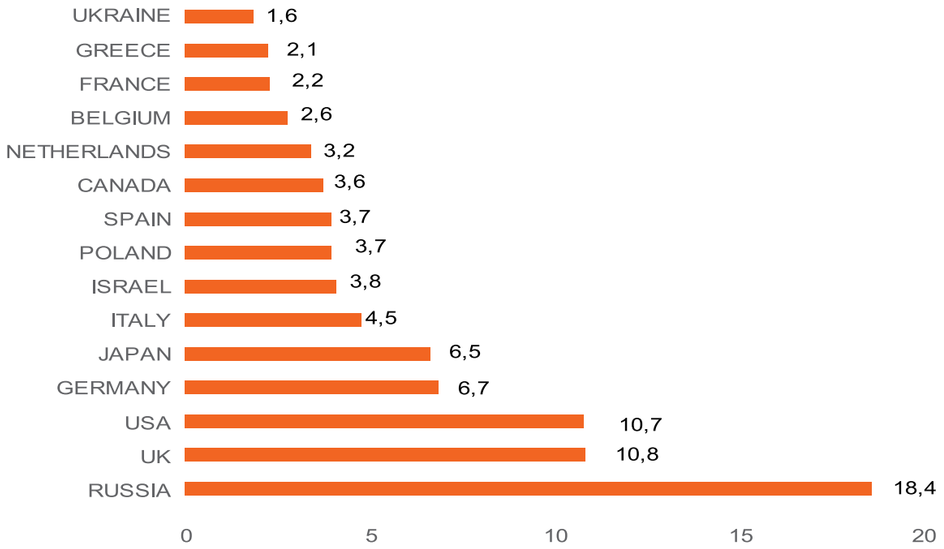


Figure. Top 15 co-authors – KYRGYZSTAN
(Total co-autors from 53 countries, selected 15 countries constitute 83,8%)

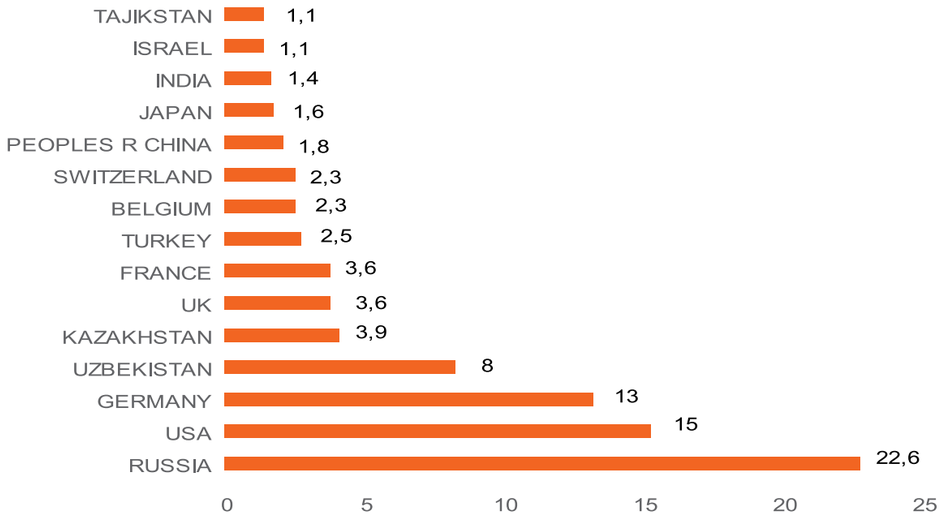


Figure. Top 15 co-authors – TAJIKISTAN
(Total co-autors from 35 countries, selected 15 countries constitute 81,8%)

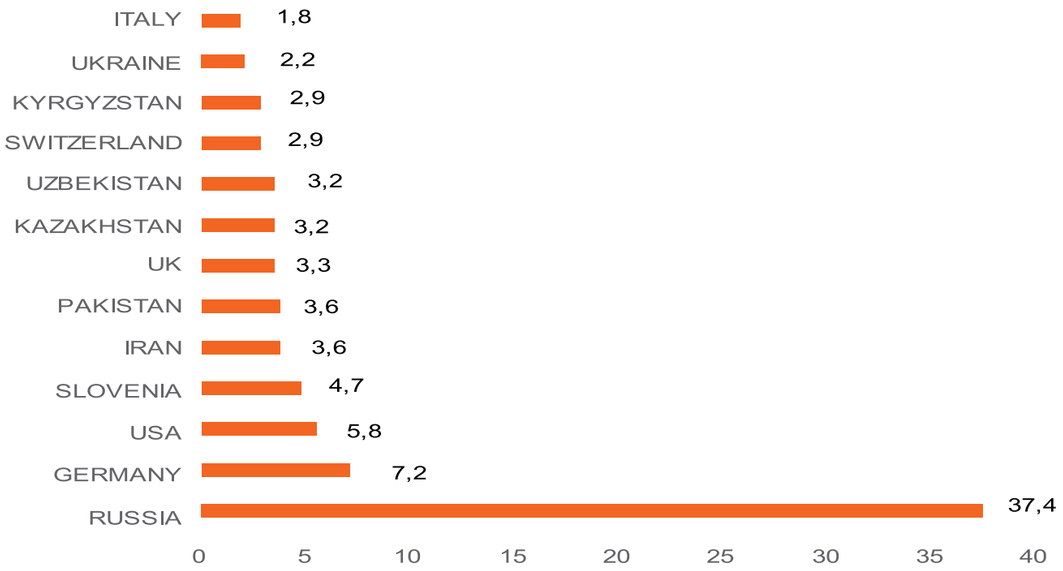
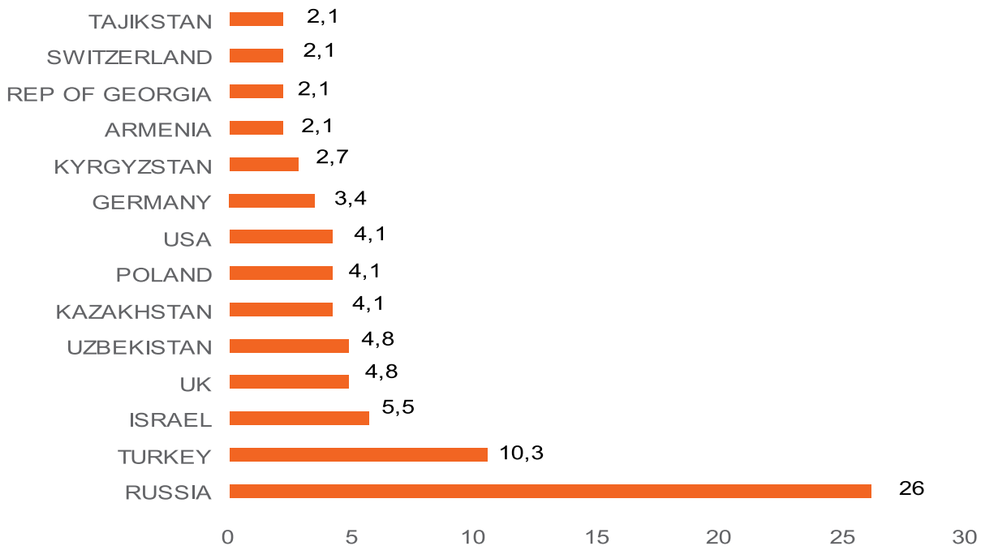
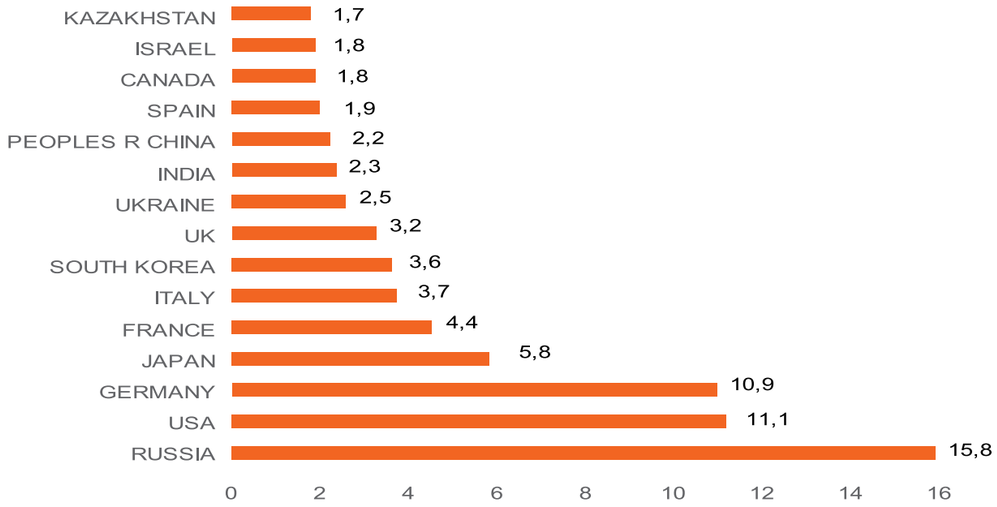


Figure. Top 15 co-authors – TURKMENISTAN
(Total co-autors from 37 countries, selected 15 countries constitute 78,2%)



Top 15 co-authors – UZBEKISTAN
(Total co-autors from 85, selected 15 countries constitute 72,7%)



As data for SSH community performance, derived from ISI SSCI and AHCI do not give us the complete picture, we can use them only for illustrative purposes. Meanwhile, from received data we may exhibit some intersections between SSH and sciences fields – firstly it shows that the leading countries in the region are Kazakhstan and Uzbekistan. Russia, of neighbouring countries has the biggest influence, but the impact of Turkey is also considerable. As in case of all the new independent states (NIS), the main collaborators from advanced countries are GB (UK) and USA.

Table. Core journals in Sciences (1996-2007) in %

Title	Publisher's country	KZ	KG	TJ	TM	UZ	RANK
Chemistry of Natural Compounds	US	3.1	2.9	1.1	0	11.7	1
Khimiya Prirodnykh Soedinenii	RU	1.2	1	0.9	1.9	10.4	2
Russian Journal of Applied Chemistry	RU	4.05	0.6	4.2	0	1	3
Izvestiya Physics of Solid Earth	RU	0	2	0	3.9	0	4
Abstracts of Papers of the American Chemical Society	US	0.2	0	0	1	4.4	5
Geologiya i Geofizika	RU	0.2	4.7	0.2	0	0	6
High Temperature	RU	0.4	4.3	0.4	0	0	7
Mikologiya i Fitopatalogiya	RU	0.1	0	0	4. 9	0	8
Technical Physics Letters	US	0.5	0	0.7	1.9	1.7	9
Differential Equations	RU	1.2	0	1.5	1	1	10

Key: KZ: Kazakhstan; KG: Kyrgyzstan; TJ: Tajikistan; TM: Turkmenistan; UZ: Uzbekistan

Table. Core journals in SSH (1996-2007) in %

Title	Publisher's country	TJ	TM	UZ	KG	KZ	RANK
Sotsiologicheskie Issledovaniya	RU	0	0	5.4	16.3	24.8	1
European Journal of Public Health	SE	25	0	5.4	0	0.8	2
Food Policy	UK	6.25	12.5	5.4	2	1.6	3
World Literature Today	US	0	0	8.9	6.1	4	4
Anthropology and Archaeology of Eurasia	US	6.25	0	0	8.2	0.8	5
International Journal of Occupational and Environmental Health	US	6.25	0	1.8	2	0.8	6
World Development	UK	6.25	0	1.8	2	0	7
Energy Policy	UK	0	0	1.8	2	1.6	8

Key: TJ: Tajikistan TM: Turkmenistan UZ: Uzbekistan KG: Kyrgyzstan KZ: Kazakhstan

As we see, the dominance of Russia is especially noticeable in core journals. Meanwhile, as the list of journals in the fields of SSH reflects a very limited amount of real the output of researchers, all accrediting and evaluating bodies have defined their own lists of journals.

For example, the Certification Commission of the Republic of Uzbekistan for social science and humanities approved the following list of journals:

- Public Opinion. Human Rights
- Herald of National University of Uzbekistan
- Herald of Tashkent State Juridical University
- Herald of Tashkent State Pedagogic University
- Herald of Kara-Kalpak Branch of Academy of Science of the Republic of Uzbekistan
- Herald of Ferghana State Pedagogic University
- Herald of Samarqand State University
- Herald of Tashkent Islamic University
- Civil Society
- Lawyer
- Taffakur
- History of Uzbekistan
- Social Science in Uzbekistan
- History of Material Culture of Uzbekistan
- State and Law
- Oriental Studies, Academy of science of Uzbekistan
- Oriental Studies, Tashkent Institute of Oriental Studies
- Human Rights and Democratization

Traditionally for all CIS countries, there are fields which are still dominant – Chemistry, Mathematics and Physics. Kazakhstan has good level of researchers in the field of Physics, Chemistry, Geosciences, Biology, Engineering, Space Science, and Mathematics. Kyrgyzstan is good in Geosciences, and Uzbekistan in Physics, Chemistry, Space Science, Materials Science, Engineering, Molecular Biology, and Mathematics.[23]In most cases these results are achieved because of the limited number of highly cited papers. At the same time these results show the existence of high level researchers behind them.

[23] ISI Essencial Science Indicators as of February, 2008.

Table. Priority fields of authors from Central Asia in sciences in % (SCI, 2008)

FIELD	KZ	KG	TJ	TM	UZ	RANK
Chemistry, Organic	7.3	3.9	3.1	3	24.5	1
Mathematics	5.3	1.4	14.4	7.9	5.2	2
Physics. Applied	3.4	7.8	6.3	4	7.5	3
Astronomy & Astrophysics	3.1	5.3	7.2	0	3.6	4
Chemistry. Physical	7.3	0.8	4.8	3	3.2	5
Geochemistry & Geophysics	2.6	0	6.6	8.9	0.4	6
Physics. Condensed Matter	3.1	2.1	2	5.9	5.4	7
Multidisciplinary Sciences	1.1	1	9.4	5.9	1.1	8
Materials Science,. Multidisciplinary	4.7	1.8	3.9	3	3.5	9
Chemistry,. Multidisciplinary	5.6	0.8	1.8	1	6.7	10
Physics,. Particles & Fields	5.7	5.3	0.2	0	3.4	11
Physics, Multidisciplinary	5.3	0	0.9	1	5.4	12
Chemistry, Applied	4.5	1	4.4	1	1.4	13
Geosciences, Multidisciplinary	1.4		6.1	4	0.8	14
Chemistry, Inorganic & Nuclear	3.7	0.8	4.8	0	1.8	15
Nuclear Science & Technology	5,8	1.4	1.1	0	2.7	16
Physics, Nuclear	3.7	1.2	0.2	0	5.3	17
Polymer Science	4,7	0	4.6	0	0.9	18
Psychiatry	0,6	3.3	0.7	3	0.5	19

Key: KZ: Kazakhstan; KG: Kyrgyzstan; TJ: Tajikistan; TM: Turkmenistan; UZ: Uzbekistan

Table. Priority fields of authors from Central Asia in SSH in % (SSCI and A&HCI. 2008)

Field	TJ	TM	UZ	KG	KZ	RANK
Economics	12.5	25	25	12.4	7.2	1
Psychology	0	37.5	10.8	0	22.4	2
Public, Environmental & Occupational Health	37.5	0	19.6	2	7.2	3
Psychiatry	6.25	25	1.8	24.5	2.4	4
Sociology	0	0	5.4	16.3	25.6	5
Anthropology	18.75	0	1.8	10.2	4	6
Geography	6.25	12.5	3.6	4.1	1.6	7
Agricultural Economics & Policy	6.25	12.5	5.4	2	1.6	8
Food Science & Technology	6.25	12.5	5.4	2	1.6	9
Nutrition & Dietics	6.25	12.5	5.4	2	1.6	10
Area Studies	6.25	0	7.1	4.1	0.8	11
Geosciences, Multidisciplinary	12.5	0	1.8	2	0	12
Environmental Sciences	6.25	0	1.8	2	4	13
Environmental Studies	6.25	0	1.8	2	4	14
Planning & Development	6.25	0	1.8	4.1	0.8	15
International Relations	0	0	1.8	6.1	3.2	16
Health Policy & Services	0	0	3.6	4.1	1.6	17
Business	0	0	1.8	6.1	0.8	18
Health Care Sciences & Services	0	0	1.8	4.1	1.6	19

Key: TJ: Tajikistan TM: Turkmenistan UZ: Uzbekistan KG: Kyrgyzstan KZ: Kazakhstan

Institutions which differentiate from others in SSH field are: from Kazakhstan -Al-Farabi Kazak National University, from Kyrgyzstan - American University in Central Asia; and from Uzbekistan - Tashkent State Economic University.

Citedness vs un-citedness

Citations to scholarly work are the most widely accepted indicators that show the "value" of scholarly output. Countries and territories vary in their level of scientific effort as measured by publication and citation activity. The distribution of effort is uneven, and dominated by the developed countries/territories. The level of activity is roughly correlated with GNP or other measures of economic output. Comparing countries on a citations per paper basis can help correct for size (output) differences[24].

Table . Percentage of Science Authors, by country, who cited papers from Central Asia (ISI SCI, 2008)

Country	TJ	TM	UZ	KG	KZ	Rank
USA	26	32.5	21.2	35.1	24.7	1
Russia	19	15	12	13.9	18	2
Germany	10.4	12	12.8	13.5	15.1	3
Great Britain	13.9	10.4	7.4	12.5	14.8	4
China	8.4	8.5	9.7	10.5	8.4	5
France	7.3	6.3	6.3	9.9	9.2	6
Italy	6.1	6.7	5.4	4.7	8	7
Japan	3.2	4.7	8.2	3.8	8.5	8
Uzbekistan	1.4	2.4	18.7	1.8	0.8	9
Spain	3.2	3.9	4.7	3.4	5.2	10
Canada	2	5.1	3.3	4.1	4.9	11
Switzerland	2.4	4.5	1.5	5.8	4	12
India	3.5	3.7	3.8	2.8	2.8	13
Australia	3.2	6.1	2.2	2.2	2	14
Tajikistan	14.3	0	0.1	0.4	0.1	15
Kyrgystan	0.7	0.6	0.2	11.5	0.5	16
Turkey	1.4	7.5	1.4	1.6	1	17
Ukraine	3.5	2.9	2.2	0.9	1.8	18
Estonia	5.2	2	0.3	1.2	0.6	19

Key: TJ: Tajikistan TM: Turkmenistan UZ: Uzbekistan KG: Kyrgyzstan KZ: Kazakhstan

Table. Authors from SSH fields by country who cited papers from Central Asia in % (ISI SSCI and A&HCI, 2008)

Country	TJ	TM	UZ	KG	KZ	Rank
USA	15.4	20	33.3	38.9	32.8	1
Great Britain	30.8	10	20	36.8	24.2	2
Russia	30.8	0	5	2.6	18.75	3
China	23.1	0	1.6	8.3	4.7	4
Germany	0	10	6.7	5.6	10.9	5
France	7.7	10	3.3	2.6	3.8	6
Kyrgyzstan	0	0	5	0	16.4	7
Israel	7.7	10	3.3	0	0	8
Switzerland	0	0	3.3	11.1	3	9
Netherlands	0	10	1.6	5.3	0	10
Mexico	7.7	0	0	8.3	0	11
Japan	0	0	1.6	2.6	11.7	12
Turkey	0	10	5	0	0	13
Uzbekistan	0	0	13.3	0	1.5	14
Italy	0	0	3.3	0	9.4	15
Canada	0	0	6.7	2.6	3	16
India	0	0	0	8.3	3.8	17
Turkmenistan	0	10	1.6	0	0	18
Georgia	0	0	0	5.6	5.6	19
Norway	0	10	0	0	0.8	20
Egypt	0	0	8.3	0	1.5	21
Belgium	0	0	1.6	5.6	2.3	22
Ukraine	0	0	5	0	1.5	23
Denmark	0	0	0	5.6	0.8	24
Finland	0	0	0	0	5.5	25

Key: TJ: Tajikistan TM: Turkmenistan UZ: Uzbekistan KG: Kyrgyzstan KZ: Kazakhstan

Dr Henk Moed from Leiden University prepared a report in 2007 which presents a series of bibliometric indicators based on publication counts.[25] The time period taken into account was an 11-year period, 1996-2006. He made calculations by three indicators: the first indicator was the *average number of published articles per year during 1996-2006*. This indicator does *not* take into account the size of the country in terms of its *population size*. Nor does it take into account a country's *Gross Domestic Product (GDP)*. Countries with a large population size and/or a high GDP tend to have higher numbers of published articles than countries that are smaller. It is useful and informative to correct for these differences in size. Therefore the following two additional indicators were calculated: *the average number of published articles per year per million inhabitants*, and *the average number of published articles per year divided by GDP (expressed in billion US dollars)*. The data on population size and GDP relate to the year 2006 and were obtained from the World Bank (Data and Research page, Key Statistics per country).

All five Central Asia countries were included in the analysis: Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan. In order to be able to compare the outcomes for the five principal countries with those from other countries, several other countries were included in the analysis, most of them with similar geo-political background and/or to some extent similar population sizes and GDP. The following countries were selected: Estonia and the Slovak Republic (from Eastern Europe); Armenia, Georgia, and Ukraine (three other countries from the former USSR); and China.

The outcomes are presented in Table below.

Table. Bibliometric Indicators per country

Country	GDP (i)	POP (ii)	PA(iii)	PA/GDP(iv)	PA/POP(v)
KAZAKHSTAN	77.2	15.3	209	2.7	13.6
KYRGYZSTAN	2.7	5.2	37	13.8	7.2
TAJIKISTAN	2.8	6.7	34	12.3	5.1
TURKMENISTAN	10.5	4.9	8	0.8	1.7
UZBEKISTAN	17.2	26.5	322	18.7	12.2
ARMENIA	6.4	3.0	352	55.0	117.4
ESTONIA	16.4	1.3	645	39.4	496.5
CHINA	2,668.0	1,312	42,553	15.9	32.4
REP OF GEORGIA	7.6	4.4	269	35.4	61.1
SLOVAKIA	55.0	5.4	2,116	38.5	391.8
UKRAINE	106.1	46.6	4,120	38.8	88.4

(i) ***GDP***: The Gross Domestic Product (GDP) in 2006 expressed in billions of US Dollars.
(ii) ***POP***: The population size in 2006 expressed in millions of inhabitants.
(iii) ***PA***: The average number of published papers per year during 1996-2006.
(iv) ***PA/GDP***: the average number of published articles per year divided by GDP for 2006 (expressed in billion US dollars).
(vi) ***PA/POP***: the average number of published articles per year per million inhabitants for 2006.

[24] ISI Essencial Science Indicators, February 2008.

[25] Henk F. Moed. Bibliometric Indicators for Kazachstan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan.. PHOENIX Newsletter, 2007, 10. available at http://phoenix.irc.ee

The Table shows that among the five principal countries, Kazakhstan and Uzbekistan have the largest number of published articles per million inhabitants (PA/POP, 13.6 and 12.2, respectively) and Turkmenistan and Tajikistan the lowest (1.7 and 5.1). With respect tothe average number of published articles per year divided by GDP (PA/GDP), Uzbekistan has the highest ratio (18.7), followed by Kyrgyzstan (13.8) and Tajikistan (12.3).

An analysis of scores per year did not reveal any significant trend, upwards or downwards, for the five principal countries included in the analysis. For each country, the annual number of publications per year rather strongly fluctuated around the average.

Taking into account the benchmark countries in the comparative set, the effect of 'normalization' of the publication counts by dividing them by population size or GDP is the most clearly visible in the instance of China. Although the average annual number of published articles from China amounts to 42,553, China's average number of published articles per year divided by GDP is slightly lower than that for Uzbekistan, and only slightly higher than for Kyrgyzstan and Tajikistan. Generally, the Eastern European countries and the other three former USSR republics show GDP indicator values for the published articles that are higher than those for the five principal countries in this analysis, and for the number of published articles per million inhabitants even substantially higher.

In order to give a valid and useful interpretation of the outcomes of the bibliometric study, it is essential to take into account the specific economic and historical-political conditions of the five principal countries. The policy implications of the outcomes have to be compiled by experts who have a detailed knowledge of the countries, their science systems and research policies. But the report shows that bibliometric indicators can be useful tools, as they can be used to monitor a country's research activity and performance at the international research front.

Research in Central Asia is mostly carried out by national Academies of Sciences which are the most prestigious centres of scientific research, to the extent that almost all the leaders of each country are full members of their national academy.

Despite the sharp decrease in the number of researchers and the decline in Research and Development funding throughout the region there are first class research centres, which are able to cooperate on level terms.

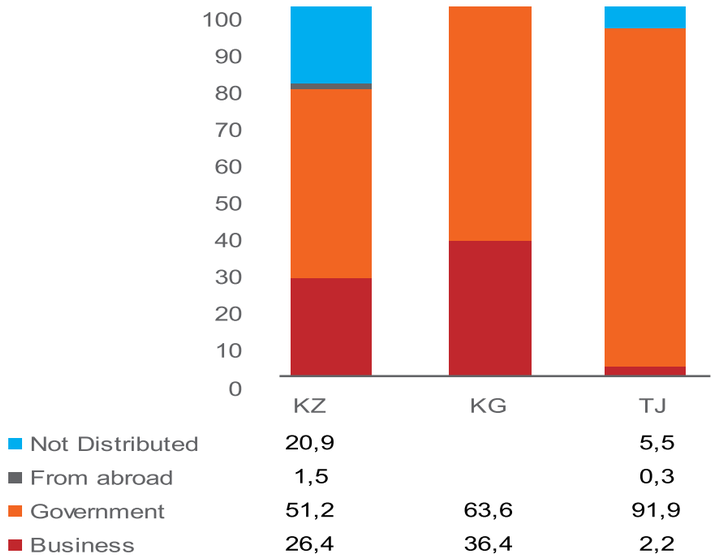
International cooperation

Several research studies and reports on science and technology indicators show intensification of international scientific cooperation practically in all science areas. Considerable quantitative and structural changes have happened especially during the last decades of the 20th century. These changes can be attributed not only to the universal trends of globalisation, but also to the political and economical restructuring in several countries and world regions as well. The extent of international co-operation differs significantly between small and large countries. Small and less developed economies engage more actively in international collaboration (about half of the outcomes are the result of international cooperation). At the same time, large countries also report the greatest expansion in the extent of international collaboration.

The same tendencies are seen also in Central Asia. Beginning from the 1990s, activities to support the constitutions of education and research systems started in Central Asia, in parallel with different support programs. We can mention INTAS, TEMPUS-TACIS, IREX, USAID, UNESCO etc. By now, the first attempts have been made at participation in EU Framework Programmes (FP).

Despite the fact, that the impact of international funding is very high inside the research community, it constitutes a rather small amount of the gross domestic expenditure on research and development.

Figure. Percentage distribution of gross domestic expenditure on research and development by source of funds (year 2005)[26]



[26] http://stats.uis.unesco.org/unesco/TableViewer/document.aspx?ReportId=143&IF_Language=eng

EU Programmes

INTAS

The most well known European programme in the region, as in the whole CIS, is INTAS. In 1993 – 2006, INTAS supported a large number of projects through its Open and Thematic Calls, Young Scientists Fellowships (YSF) and Summer Schools programmes.

Among them, 21 projects belonged to SSH fields.

Table. INTAS projects and budget in the field of SSH during the period 2000-2006.

Country	TJ	UZ	KG	KZ	Total
Projects	3	10	8	10	21
Participants	15	31	45	51	119
Received funding (in million Euro)	0.3	0.8	0.9	1.3	3.3

Table. INTAS projects in the fields of SSH 2000-2006. Distribution partners by country.

Country	TJ	UZ	KG	KZ	Total
Russia	5	4	9	9	27
Great Britain	1	5	5	7	18
Kazakhstan	1	4	4	4	13
France	1	4	2	4	11
Germany		4	3	4	11
Uzbekistan	1		2	5	8
KyrgyzstanG	2	1		4	7
Armenia	1		3	1	5
Belorus			3	2	5
Ukraine		1	3	1	5
Moldova		1	2	2	5
Austria		1	1	2	4
Georgia			2	2	4
Tajikistan		1	2	1	4
Finland	1	1	1	1	4
Israel	1	1	1	1	4
Lithuania			2	1	3
Sweden	1		2		3
Netherlands		1		2	3
Romania	1		1		2
Italy				2	2
Spain		1		1	2
Slovenia			1	1	2
Czech Republic			1		1
Bulgaria	1				1
Estonia	1				1
Poland			1		1

As we see, five countries formed the core group of main collaborators. Three, Great Britain (UK), Germany and France are representatives of advanced EU countries, while Russia and Kazakhstan are key representatives of influence centres in the region.

The thematic areas were essential to solve at the given time – problems of governance, security issues, environmental problems, labour market issues, but at the same time issues which concern national identities, culture, language, and histories.

Table. INTAS projects by title and participating organisation

Project Title	Institution	Country
1. A reconstruction of prehistoric Eurasian mythological motif complexes and their most ancient distribution in connection with genetic data	Institute for the Humanities. Department of Philology	TJ
2. Central Asia and the European Union: cooperation in the sphere of international security.	The Kazakh National University named after Al-Farabi, Ministry of Education and Science of the Republic	KZ
	The Kazakh National University named after Al-Farabi, Ministry of Education and Science of the Republic. Department of Political Science	KZ
3. Corporate Governance Practices and Prospects in Transition Countries: The Case of Russia, Ukraine, and Kyrgyzstan.	CASE-Kyrgyzstan, Centre for Social and Economic Research	KG
4. Crop Protection Perspectives in Kazakhstan: Shifting Interfaces between Farmer Practice and Agricultural Research	The Research Institute for Crop Protection	KZ
	The Research Institute for Crop Protection	KZ
5. Democratic Opposition as a Consolidation Factor in Transitional Regimes: Comparative Analysis of Armenia, Kyrgyzstan, Russia and Tajikistan.	Research Centre "Eurasia". Department of Social-Political Management	KG
	Centre for Strategic Research under the President of Tajikistan. Department of Non-Traditional Threats	TJ
6. Economical assessment of joint and local measures for the reduction of socio-economical damage in the coastal zone of Aral Sea	National Ecological Society of the KZ	KZ
	Scientific Information Centre	UZ
7. Education, labour markets and human resource management in Central Asia	Socinformbureau, Bishkek, Kyrgyz Republic	KG
	Samarkand State University	UZ
	Management Research Group	KZ
8. Eurasian Political Studies Network: Developing comparative studies of regime transformations in multicultural societies and state- nation-building process in post-soviet region	American University - Central Asia	KG
9. Female entrepreneurship in transition economies: the example of Ukraine, Moldova and Uzbekistan	Business Women Association of Uzbekistan	UZ
10. Inter-States regional integration in post-Soviet Central Asia: analysis and practical recommendations.	The Institute of History	UZ
	The Institute of History	UZ
11. Kongrat group identities throughout contemporary Central Asia. Changes and continuities in "tribal" culture.	Institute of History, Archaeology and Ethnography	UZ

12. Labour, migration, identities: challenges and relations of social insecurities in Kazakhstan and Uzbekistan	Sharh va Tavsiya Sociology Centre	UZ
	German Kazakh University. Social Sciences Research Centre	KZ
13. Land use and irrigation works in Kazakhstan in the present and in historical times. Geo-archaeological investigations.	Academy of Sciences. Institute of Archaeology	KZ
	Almaty Institute of Power Engineering and Telecommunications. Chair of Environmental Technology	KZ
	Academy of Sciences. Institute of Geological Sciences	KZ
	Academy of Sciences. Institute of Soil Sciences	KZ
14. New language identity in transforming societies: Kazakhstan, Kyrgyzstan, Tajikistan and Uzbekistan	The Humanities Division at Kyrgyz – Russian Slavic University, Department of the Russian language.	KG
	Tajik National State University	TJ
	Samarkand State University	UZ
	The Kazakh National University named after Al-Farabi	KZ
15. Preparing dissertation in Information law and developing Information law teaching course with international scope. The title of my dissertation is: "Legal bases of circulation of information products in Internet". Title of teaching course "Information law	Kyrgyz-Uzbek University	KG
	Kyrgyz-Uzbek University. Faculty of Law	KG
16. Social and Political Trends for CIS Countries: Key-Indicators and Social Measurements of Transition	Centre for Sociological, Politological and Social-Psychological Research	KG
	Centre for Study of Public Opinion	KZ
17. The Kongrat group identities throughout contemporary Central Asia. Changes and continuities in "tribal" culture.	Institute of History, Archaeology and Ethnography	UZ
18. The Nature of State – Civil Society Relations in the countries of Central Asia	National University of Uzbekistan	UZ
	National University of Uzbekistan. Faculty of Social and Political Sciences	UZ
19. Tolerance and Intolerance in the Post-Soviet Press: Applying New Methods of Measurement and Evaluation	Eurasian National University	KZ
	Social Fund Resource Centre of Samarkand Region	UZ
20. Trade unions in post-socialist society: overcoming the state-socialist legacy?	The Kazakh National University named after Al-Farabi Department of Management of Media and Advertising	KZ
	SIAR Bishkek Marketing Research	KG
21. Water problems in Central Asia: politics-economical aspects and relations between the riparian states.	Tashkent State Economic University	UZ
	Tashkent State Economic University	UZ

Key: TJ: Tajikistan UZ: Uzbekistan KG: Kyrgyzstan KZ: Kazakhstan

The most active institutions were: Kyrgyz-Uzbek University, National University of Uzbekistan, Samarkand State University, Tashkent State Economic University, The Kazakh National University named after Al-Farabi.

TEMPUS

TEMPUS started its activities in 1990, Kazakhstan, Kyrgyzstan; Uzbekistan became partner countries in 1994, when the second phase of Tempus commenced. Turkmenistan and Tajikistan were included in the programme in 1996. Tempus III was initiated in 2001 (and continued until 2006).

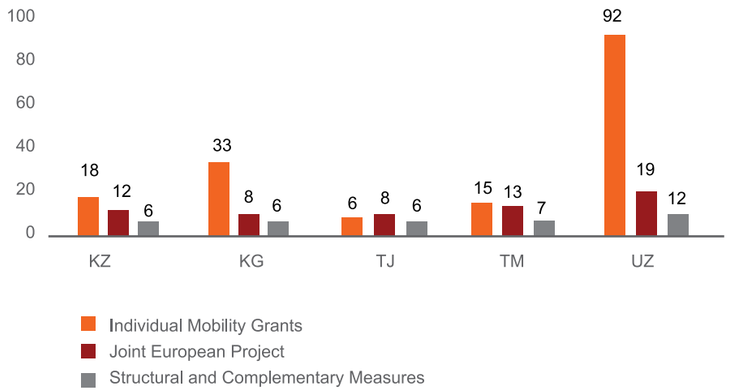
TEMPUS supported the restructuring of higher education systems through financing grants to encourage interaction and balanced cooperation between universities in the partner countries and the European Community.

Table. TEMPUS III projects in Central Asia (2001-2006)[27]

Year	TACIS Total	KZ	KG	TJ	TM	UZ	Total
2001	90	2	3		1	2	8
2002	246	1	2	0	7	13	23
2003	704	5	8	0	9	33	55
2004	596	11	20	2	6	48	87
2005	160	7	10	9	9	14	49
2006	183	10	4	9	3	13	39
Total	**1979**	36	47	20	35	123	**261**

Key: KZ: Kazakhstan KG: Kyrgyzstan TJ: Tajikistan TM: Turkmenistan UZ: Uzbekistan

Figure. TEMPUS III projects in Central Asia by instrument



The proportion of Central Asian projects of the global total of TEMPUS/TACIS projects was 13.2% (261 projects). The biggest beneficiary, by far, from Central Asia was Uzbekistan with 123 projects being led in the country, followed by Kyrgyzstan. The majority of the projects (63%) consisted of individual mobility grants, 23% belonged to Joint European Projects and 14% to Structural and Complementary Measures. Around 10% of the budget was given to SSH fields.

The most active universities were:

- From Uzbekistan: Tashkent State University of Economics, Tashkent State University, Samarkand State University, Uzbek State World Languages University, Bukhara State University, National University of Uzbekistan, Urgench State University, Tashkent State Pedagogical University, Westminster International University in Tashkent.
- From Kyrgyzstan: Bishkek Academy of Finance and Economics, Issyk-Kul State University Jalal-Abad State University, Kyrgyz Agrarian University after K.I.Skriabin, Kyrgyz National University named after J.Balasagyn, Kyrgyz State University named after I.Arabaev, Osh State University.

[27] http://ec.europa.eu/education/programmes/tempus/stat_en.html

EU FRAMEWORK PROGRAMMES

Up till now, the participation of institutions from Central Asia in EU FP is accidental. Despite the fact that researchers from these countries started to participate already during FP4, we can follow only the moderate growth in amount of participation. Three organizations from Kyrgyzstan and one organization from Uzbekistan have participated in SSH specific programmes.

Table. Number of FP6 projects in Central Asia

Priority Area	KZ	KG	TJ	TM	UZ
3. Nanotechnologies and nanosciences, knowledge-based multifunctional materials and new production processes and devices	1	0	0	0	0
4. Aeronautics and space	1	0	0	0	0
5. Food quality and safety	1	0	0	0	0
6. Sustainable development, global change and ecosystems	2	0	0	0	3
7. Citizens and governance in a knowledge-based society	0	3	0	0	1
Specific measures in support of international cooperation	8	4	3	3	6
Support for the coherent development of research & innovation policies	1	0	0	0	0
Research infrastructures	1	1	1	0	0
Human resources and mobility	0	1	0	0	2
Policy support and anticipating scientific and technological needs	0	0	1	0	0

Key: KZ: Kazakhstan KG: Kyrgyzstan TJ: Tajikistan TM: Turkmenistan UZ: Uzbekistan

A total of 29 projects were conducted with participation from several Central Asian institutions. The majority were Specific Support Actions, which means that several workshops, training courses, and mapping exercises were carried out.

Table. Participants in FP6 projects by country and region.

Partners	KZ	KG	TJ	TM	UZ
EU+[28]	66	40	17	6	71
Asia	0	1	0	0	4
Africa	5	4	1	0	7
EECA	51	20	21	15	24
S-America	4	1	0	0	2
N-America	3	0	0	0	0
WBC	1	3	0	0	0
Total	130	69	39	21	18

Key: KZ: Kazakhstan KG: Kyrgyzstan TJ: Tajikistan TM: Turkmenistan UZ: Uzbekistan

Traditionally, the biggest collaboration partners were Germany, Great Britain (United Kingdom) and France from the advanced countries, and Russia, Uzbekistan and Kazakhstan from the region. Organizations from 63 countries worked in collaboration (in Kazakhstan - 47 countries, Kyrgyzstan - 36 countries, Tajikistan - 18 countries, Turkmenistan - 10 countries, and Uzbekistan - 37 countries).

[28] These data include the EU 27 member states, associated countries and candidate countries.

Figure. Cooperation in FP6 – KAZAKHSTAN
(Total partners from 47 countries, selected 15 countries constitute 67,7%)

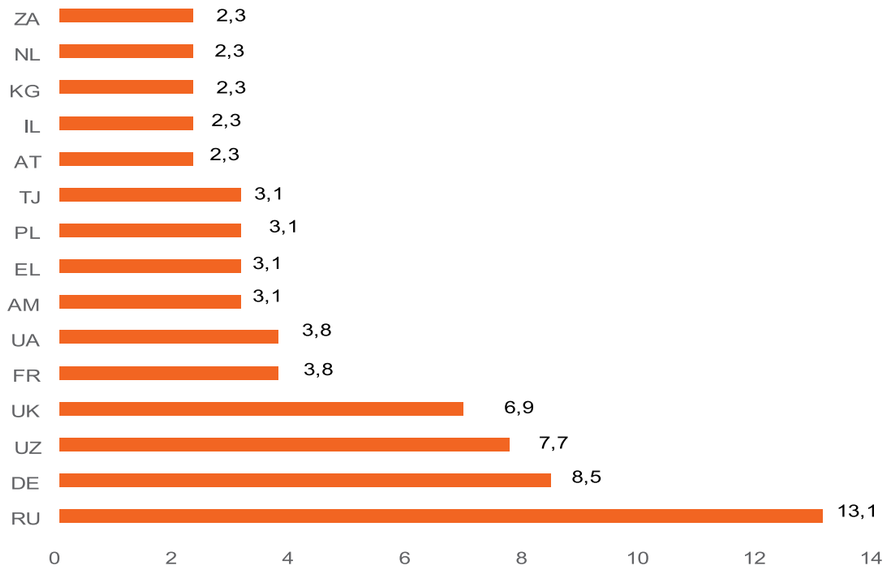


Figure. Cooperation in FP6 – KYRGYZSTAN
(Total partners from 37 countries, selected 15 countries constitute 67%)

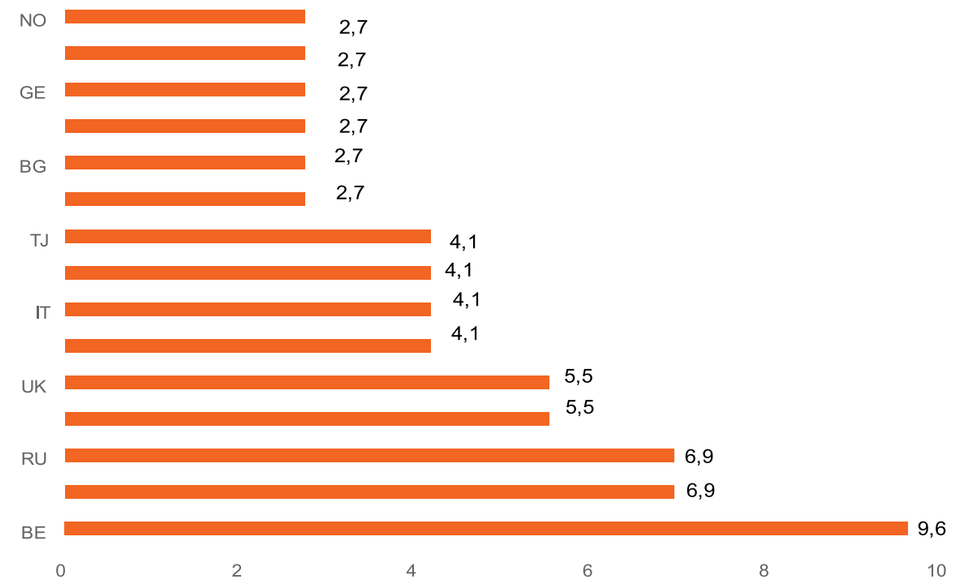


Figure. Cooperation in FP6 – TAIJIKISTAN
(Total partners from 18 countries, selected 9 countries constitute 77%)

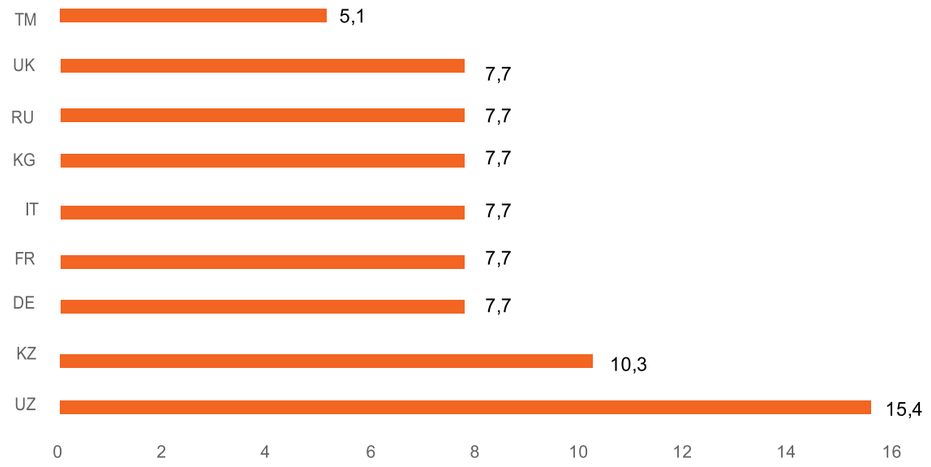


Figure. Cooperation in FP6 – TURKMENISTAN
(Total partners from 10 countries, selected 10 countries constitute 100%)

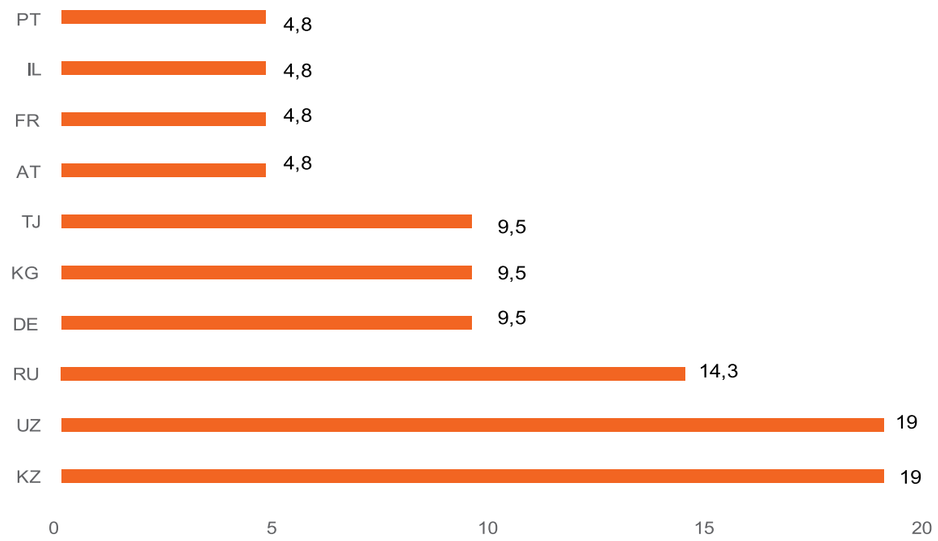
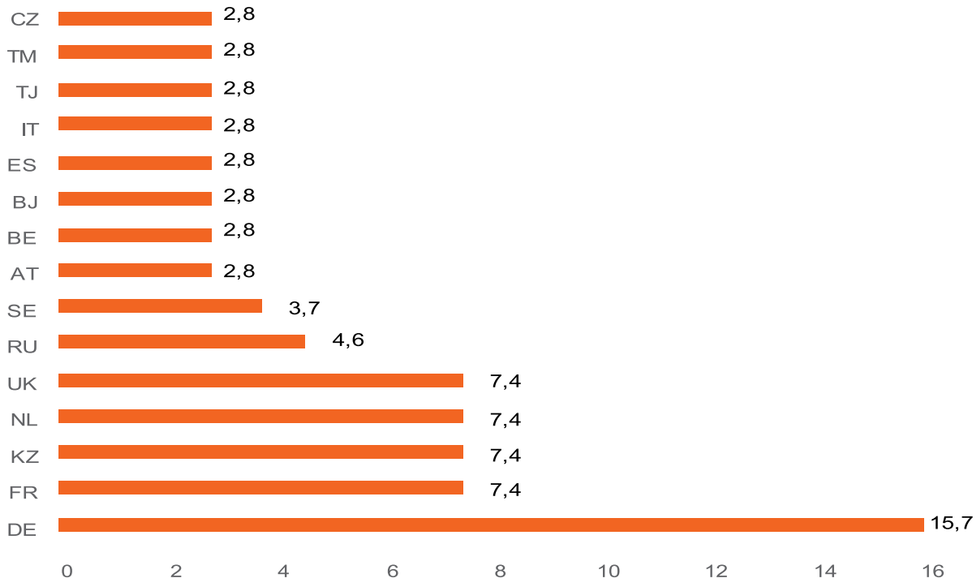


Figure. Cooperation in FP6 – UZBEKISTAN
(Total partners from 37 countries, selected 15 countries constitute 76%)



The most active institutions from Central Asia were: Kazakhstan - Almaty Institute of Power Engineering and Telecommunications, Independent Expert Consulting Board to Promote Scientific Research Activity in Kazakhstan; Kyrgyzstan - Centre for Social and Economic Research in Kyrgyzstan; Uzbekistan - Scientific Information Centre of Interstate Water Coordination Commission of Central Asia.

FP6 Projects in the field of SSH

Project Title	Institution	Country
A Micro-Level Analysis of Violent Conflict	Centre for Social and Economic Research in Kyrgyzstan	KG
EU Eastern Neighbourhood: Economic Potential and Future Development	Centre for Social and Economic Research in Kyrgyzstan	KG
Fostering the rebirth of social sciences and humanities in the Central Asia	Kyrgyz Centre of Science and Technology Development	KG
Mobilising Future Research Collaborations in Social Sciences and Humanities in the EU, NIS and China	Centre for Economic Research	UZ

Key: EU: European Union NIS: New Independent States KG: Kyrgyzstan UZ: Uzbekistan

In FP7 during the first call in SSH programmes in 2007, four projects were applied with participation of Kazakh (three projects) and Kyrgyz (one project) partners. Two of them passed the evaluation threshold, but none was funded.

Other programmes

The influence of several **USA based** support organizations is very visible in Central Asia. The **Soros Foundation** started its activities in 1990s, the key fields were:

- Mass Media support,
- Health care,
- Culture,
- Education,
- Science, law and economics

IREX supported the improvement of the quality of education, strengthening the independent media, and fostering pluralistic civil society development. Via IREX, the Edmund S. Muskie Graduate Fellowship Programme was implemented, which is a program of the Bureau of Educational and Cultural Affairs of the US Department of State. The programme provided opportunities for Master's level study in the United States to citizens from Central Asia, and limited opportunities for Doctoral studies of approximately four years in the United States to citizens from Georgia, Kazakhstan, Russia and Ukraine. Eligible Programme Fields were:

- Business Administration
- Economics
- Education
- Environmental Management
- International Affairs
- Journalism and Mass Communications
- Law
- Library and Information Science
- Public Administration
- Public Health
- Public Policy

USAID's history goes back to the Marshall Plan reconstruction of Europe after World War II and the Truman Administration's Point Four Program. Officially USAID was started in 1961. USAID work supports long-term and equitable economic growth and advances U.S. foreign policy objectives by supporting:

- economic growth, agriculture and trade;
- global health; and,
- Democracy, conflict prevention and humanitarian assistance.

Priorities in Central Asia:

- Development of private enterprises
- Community development
- Youth policy
- Raise the quality and transparency of higher education
- Financial independence of the mass media
- Development the state governance and local self-governance
- Labour migration

Table. USAID Budget for Higher Education and Training during 2004-2007 (in million dollars)[29]

Year	KZ	KG	TJ	TM	UZ
2004	2466	2034	813	2910	2755
2005	2757	1331	1429	2570	2966
2006	195	575	360	260	150
2007	88	79	46	20	47
Total for Higher Education	5506	4019	2648	5760	5918
Total Budget	104526	128597	134957	22145	100189
Share of Higher Education	5,3	3,1	2	26	5,9

Key: KZ: Kazakhstan KG: Kyrgyzstan TJ: Tajikistan TM: Turkmenistan UZ: Uzbekistan

For example, during 2005-2006, a project on transparency in higher education and universities' ratings was lead in Kyrgyzstan. Eight pilot universities participated in the project (American University in Central Asia, Bishkek Academy of Finance and Economics, Kyrgyz-Turkey Manas University, Kyrgyz State University named after I. Arabaev, Law Academy, Naryn State University, Osh State University). As an outcome, the report "*Methodological basis for a comparative analysis of the quality of the educational process in business, economics, and law and information technology programs in higher education institutions of the Kyrgyz Republic"* was published[30].

Several international and national programmes supported and continue to support developments in Central Asia. From the point of view of SSH, UNESCO has a very important role (DENEME, HeritageNET projects).

DAAD opened its offices in Central Asia also in 1990s. The Mission of DAAD is to provide academic exchanges between Germany and Central Asia countries' researchers. The same type of activities was supported by the Humboldt Foundation.

From 2005 some projects are realised at the expense of Japan Bank of International Cooperation, Asian Development Bank, German Bank of development (KFW), and governments of Belgium, Poland and Korea.

These projects are dedicated to technical support, professional training of teaching staff, and development of teaching materials. It is planning to use $US32.97 million.

International cooperation plays an important role in all five central Asian countries.

Research institutions from Germany, Great Britain and France constitute the core of collaborators, at the same time research institutions from Russia, Uzbekistan and Kazakhstan form the core from the region.

Most collaborative projects are initiated because of practical need, which have to be solved at the given time. Those are as problems of governance, security issues, environmental problems, labour market issues, but at the same time issues which concerns national identities, culture, language, and histories.

Future themes of common interest in SSH will be:

- Environment (water resources) and Societal needs;
- Cultural Heritage;
- Migration (Inter and Extern);
- ICT and Society;
- Educational Research;
- Globalization and impact to Central Asia
- Gender Studies
- Cultural Tolerance
- Health Care and Life Styles

[29] http://www.usaid.gov/policy/budget/cbj2007/ee/

[30] Report. Methodological basis for a comp arative analysis of the quality of the educational process in business, economics, law and information te chnology programs in higher education institutions of the Kyrgyz Republic. Bishkek: USAID, June 2006

Electronic Resources

Well established research infrastructures are prerequisite of productive research. At the same time, we know that scientific research never stands still, nor the research infrastructure needed to support it.

Libraries and museums play a major role in SSH research. Today digitalized resources, open access and full texts are normal instruments in researchers everyday activities.

Since 1994, the NATO Science Programme, has been one of the major supporters of academic networking in Central Asia, helping to create an appropriate infrastructure for the communication needs of the scientific community.[31]

For a period of ten years the Virtual Silk Highways supported the development of computer networking infrastructures in eight countries, which were Armenia, Azerbaijan and Georgia of the Southern Caucasus , and Kazakhstan, Kyrgyzstan , Tajikistan, Turkmenistan and Uzbekistan of Central Asian. Several other partners supported these developments - such as CISCO, DESY, GEANT, the SOROS Foundation, UNDP, the State Department of the USA, Worldbank, University College London and the University of Groningen. Under FP6 IST programme the project OCCASION (Organising Caucasus and Central Asian Internet Offerings to NRENs) started. The main objective was to help develop the National Research and Educational Networks (NRENs) in the Silk countries and to advance collaboration between European researchers and their counterparts in the Silk countries[32].

Almost in parallel with Virtual Silk Highway project, UNESCO, together with the European Commission, initiated an ambitious project in Central Asia. The UNESCO HeritageNet Program was established in 1997 (a network of cultural Institutions in Central Asia) with the idea to internationally promote the Central Asian culture and art through the development of digital cataloguing in museums and the creation of cultural multimedia products.[33] At the time this Project was initiated in Central Asia, the Internet was an embryo. The project started with the Round Table meeting "Using Internet in Preservation of Natural and Cultural Heritage and Tourism Development", organized by UNESCO in Almaty, Kazakhstan in September 1997. Representatives of about 40 museums, libraries, higher schools and scientific research institutions, ministries and departments, Telecom operators, Internet providers and Media took part in the Round Table discussions. As the follow-up of this event three regional centers in the Kyrgyz Republic, Turkmenistan and Kazakhstan were set up in 1998.

During the project several CD-ROMs were produced: "Musical Heritage of Kazakhstan", "Kazakhstan Chronicle - as documented in Kazakh newspapers from 1913- 1932 in the Arabic alphabet", "Early Publication of the Kyrgyz Epic Poem MANAS", "Memory of Tynystanov", "Digital Archive of Kazakhstan", "Digital Oriental Heritage of Uzbekistan", "Turkestan Sites and voices of antiquity" and "Otrar expedition"; as well as "Bakhtria and Sogdiana, Tajikistan", "Architectural and archaeological monuments of Tajikistan" and "Unpublished Tajik Miniatures" [34]. Due to weak Internet connections, the idea to make central collections available was not fullfilled. One of the aims of the EU FP6 funded project PHOENIX (2006-2007) was to map social sciences and humanities Internet resources in Central Asia[35]. The majority of Internet resources are available via international organizations websites, and are created thanks to different projects. The main obstacle is that projects are not sustainable, and gathered data are not updated.

There are close to 60 million people and around 25,000 libraries in the Central Asian republics. Up till now most libraries do not have web pages or online catalogs.

Through a Soros Foundation grant, several libraries received computerized equipment and other resources.

Kyrgyzstan Library Information Consortium (95 members), Tajik Association of High Educational Establishments for Library and Information Technologies (16 members), and **Uzbekistan Library Association (79 members) are members of** eIFL.net (Electronic Information for Libraries)[36].

At a moment, the main joint library effort, including Kazakhstan, Kyrgyzstan, Uzbekistan and Tadzhikistan, called for the implementation of CALINET (Central Asia Library Information Network). The purpose of CALINET will be the development of the Central Asian republics' information infrastructure which would provide the region with open access to many information resources. The project, if it is to be effective, should develop in several directions. It should encompass the Central Asia International Library Training Center, the Central Asia Union Library Electronic Catalog, the Central Asia WWW Library Portal (in Kazakh, Kyrgyz, Uzbek, Russian and English) and enhance library cooperation among the Central Asian republics.

[31] http://www.nato.int/science/virtual_silk/info.htm

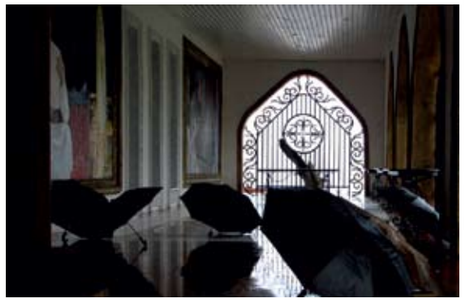
[32] http://www.ist-occasion.org/

[33] http://www.heritagenet.unesco.kz/default.htm

[34] ftp://www.unesco.kz/cdroms

[35] http://phoenix.irc.ee/?menu=resources

[36] http://www.eifl.net/



Kazakhstan

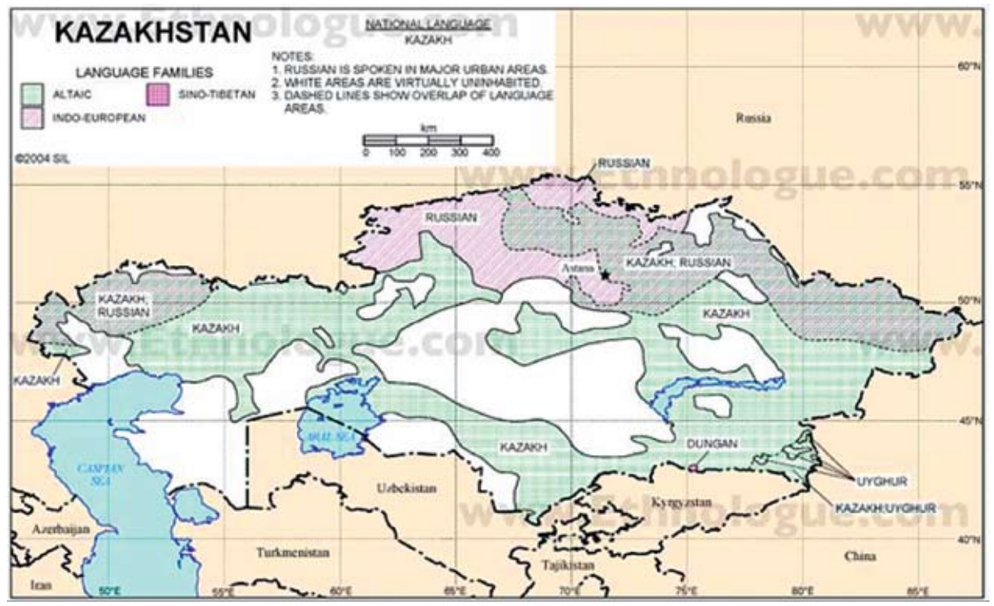
Kazakhstan, the largest of the former Soviet republics in the region (excluding Russia), possesses enormous fossil fuel reserves as well as plentiful supplies of other minerals and metals. Kazakhstan is the most advanced country in the region.

Distribution by nationality is: 41.9% Kazak, 37.0% Russian, 5.2% Ukrainian, 4.7% German, 2.0% Tatar, 2.1% Uzbek, and 7.1% others.

64.4% of the Kazakh speaking people live in Kazakhstan, the others are located in Afghanistan, China, Iran, Kyrgyzstan, Mongolia, Russia (Asia), Tajikistan, Turkey (Asia), Turkmenistan, Ukraine, and Uzbekistan.

The official language is Kazak, which is closely related to Uzbek, Kyrgyz, Turkmen and Turkish. The Cyrillic alphabet is in general use and most people in the cities can speak Russian, whereas country people tend only to speak Kazak.

Figure. Language map of Kazakhstan[37]



In the 1990s migration was an issue because of large outflows of Russians and people of other nationalities of the former Soviet Union.

Several historical monuments and landscapes have been taken under protection. Properties inscribed on the World Heritage List are[38]: Mausoleum of Khoja Ahmed Yasawi (2003) and Petroglyphs within the Archaeological Landscape of Tamgaly (2004). Properties submitted on the Tentative List: Turkic sanctuary of Merke (1998); Megalithic mausoleum of the Begazy-Dandybai culture (1998); Barrows with stone ranges of the Tasmola culture (1998); Petroglyphs of Eshkiolmes (1998); Petroglyphs of Arpa-Uzen (1998); Paleolithic sites and geomorphology of Karatau mountain range (1998); Archaeological sites of Otrar oasis (1998); Cultural landscape of Ulytau (1998); Steppe and Lakes of North Kazakhstan (2002); Northern Tyan-Shan (Ile-Alatau State National Park) (2002); State National Natural Park "Altyn-Emel" (2002); Aksu-Zhabagly state natural reserve (2002).

[37] Gordon, Raymond G., Jr. (ed.), 2005. Ethnologue: Languages of the World, Fifteenth edition. Dallas, Tex.: SIL International. Online version: http://www.ethnologue.com/

[38] http://whc.unesco.org/en/statesparties/

Research and Development policy

In 1996-1997 S&T (Science & Technology) reforms started in Kazakhstan[39]. S&T policy of the Republic of Kazakhstan was determined. As mechanisms of the realization of the posed aims the following steps were estimated.

To set:

- Countries' scientific and technical *priorities*;
- Favourable *normative - legal space*;
- *Target financing* of priority researches on the base of open competitions (tenders) with a mandatory *state expert appraisal* of the programs;
- Phased *optimization of front of fundamental researches* up to a level, necessary for the state, with mutual *coordination with applied* researches;
- Phased transition of provision resource of applied development from budget financing on a *returnable basis to parity joint financing* on the basis of budget bankrolls;
- *Optimization, re-structuring and privatization* of scientific - technological spheres' objects;
- *Address support* of small and average business in a science;
- Inducing of *development of an infrastructure* of an sphere of a science;
- *Integration* of Kazakhstan science *in world scientific space*;
- The help in a solution of social problems of the scientists and experts.

The strategy plan "Kazakhstan 2030" was set up.

In 2003, 54 different programmes in basic research were supported in five priority areas:

- IT
- NEST
- Molecular Biology, genetics and bioengineering
- Mineral resources
- Social sciences which support development of Kazakhstan society

In applied sciences, the following areas were supported:

- oil and gas industry
- metallurgy and mining industry
- new materials
- biotechnology
- IT
- agriculture
- Space technology.

In 2003 a Program of Industrial – Innovative development was adopted. On 1 March 2006 President Nursultan Nazarbaev announced the opening of new strategy - "Strategies of Kazakhstan's Entry into a Group of 50 Most Competitive States of the World", of which the aim is that by 2012 the financing of R&D will be increased by a factor of 25.

The priority research areas in SSH are outlined in "State Program of Development of Science for 2007-2012";

[39] Decree of the President of the Republic of Kazakhstan from March 11, 1996 a 2985 " About measures on improvement of a system of state management by a science in the Republic of Kazakhstan ":

Humanities

Fundamental researches in

- History;
- Archaeology;
- Linguistics;
- Literature;
- Oriental studies;
- Philosophy of Mathematics;
- Physics;
- Earth Sciences and Biology;

Objectives for humanities

- Strategies of Gender equality in Kazakhstan for 2006-2016;
- Program on Improvement of Kazakhstan Model of Ethnic and Confessional Concord for 2006-2008;
- Program of Development of Culture 2006-2008;
- State Program on Functioning and Development of Languages for 2001-2010;
- Program of Development of Archives and Documentation system for 2007-2009;
- State Program on Development of Physical Culture and Sports for 2007-2009;
- State Program on Development of Education for 2005-2010;
- State Program "Children of Kazakhstan " for 2006-2011;
- Program of Development of Licensing System in RK for 2007-2011.

Objectives for Social Sciences:

- Construction of National Information Super network;
- Implementation of the project "Electronic Government»;
- Program of Development of telecommunications industry for 2006-2008;
- Nanotechnologies and new materials;
- State Program of reformation and development of Health service in RK 2005-2010;
- Strategies on the development of the regions of RK for 2015
- State Programs on the development of Kazakhstan sector of the Caspian sea;
- Strategy of transport development to 2015.

Developments in state funding

Two forms of financing of science are proposed - basic and project based.

Basic financing:

The main steps in implementation of the state program would be:

- State investments (budget transfers) to found 15 national laboratories of open type;
- Infrastructure support (current maintenance and capital repair of buildings an premises);
- Training and upgrading staff qualification;
- Introduction of modern system of attestation of scientific stuff and accreditation of scientific and educational entities;
- Information support and licensing.

The state would finance fundamental research in History, Archaeology, Linguistics, Oriental Studies, Philosophy of Mathematics, Physics, Earth Sciences and biology.

Kazakhstan is going to accept the s.c. Finnish model of scientific research management. It was decided to move more towards project-based financing system rather than financing organizations.

Science and technology programs are planned to be financed on a project basis through Science Fund or National Innovation Fund for a period from 3 to 5 years.

Private financing of sample test constructions of scientific research works is supposed to be fulfilled through both venture funds and directly by private entities on a contract base. It is planned that by 2012, 50% of financing will be implemented by private companies. In order to accelerate introduction of scientific innovations into production there has been established several funding institutions, like Bank of Development of Kazakhstan, Investment Fund of Kazakhstan, etc.

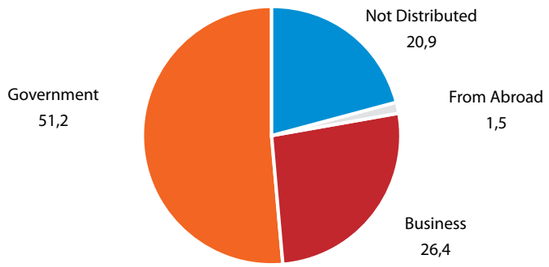


Figure. Percentage distribution of Gross Domestic Expenditure on R&D by source of funds[40]

There are three levels of scientific-research examination:

The level of definition and correction of priorities–International expert board on a 75/25 basis (75% foreign and 25% local experts);

The level of development of scientific-research programs and evaluation of the results– State scientific-research examination, held by the National Centre on Scientific-research information together with the National Institution on intellectual copyright on a 60/40 basis (see above);

The level of selection of projects for scientific research programs– Science fund (for scientific and research works) and the National Innovation Fund (for sample test and design) on a 25/75 basis (see above).

Table. General Statistics on national basis

Total number of researchers	**19,100**
Humanities	**513**
Social Science	**679**
Environmental Sciences	**3,188**
Technician	**3,098**
Medicine	**1,258**
Agriculture	**1,646**
Researchers per million inhabitants	**679**
Expenditure on R&D of GDP	**2,4%**

[40] http://stats.uis.unesco.org/unesco/ReportFolders/ReportFolders.aspx

Institutional landscape and reforms

The Ministry of Science and New Technologies was created in 1992, in order to coordinate national science and technology activities. As in Ukraine, but unlike Russia, this Ministry controls most of the funding for the scientific institutes in the country. It also funds scientific development of governmental environmental programs on the Aral and Caspian Seas.

In 1992, the Kazakh Science Foundation was created as an independent non-government organization. It consists of a nine member council, which makes final recommendations on the proposals received by the Foundation. The council members represent both Academy institutes and universities. The Foundation's budget comes from a variety of sources, including transfers from the government budget, subsidies from particular ministries, and contributions from enterprises and grants from foreign organizations. Proposals, in the area of basic research, received the most funds (80%). In 1993, a Kazakhstan Academy of Engineering and an Agricultural Academy were also established.

Most fundamental research was carried out by the Kazakh Academy of Sciences, which consists of 41 research institutes and a professional scientific staff of over 4000. In 2003, with decree of the President, the status of Kazakh Academy of Sciences was changed from state body to public body.[41] Gradually scientific research will also be given under higher educational institution management. In order to fulfil specific scientific research Funds are established where resources could be applied for on a competitive basis.

Table. SSH institutions in Kazakhstan[42]

1. Institute of Economics
2. Institute of Philosophy
3. Chokan Valikhanov Institute of History and Ethnology
4. Institute of State and Law
5. A.Kh. Margulan Institute of Archeology
6. M.O. Auezov Institute of Literature and Arts
7. A. Baitursynov Institute of Linguistics
8. Institute of Oriental Studies
9. Scientific and Cultural Centre "Auezov's House"
10. Al-Farabi Kazakh State National University.
11. Yasavi International Kazakh-Turkish University
12. State Institute of Finance
13. Sh.Yesenov Aktau University
14. Zhubanov Aktobe University
15. Kurmangazy Almaty State Conservatoire.
16. Abay Almaty State University
17. I.Altynsarin Arkalyk Pedagogical Institute.
18. Dosmukhamedov Atyrau University
19. East-Kazakhstan State University
20. "Semey" State University
21. L.N.Gumilyov Eurasian University
22. Jambyl University
23. O.A.Baikonyrov Zhezkazgan University
24. A.S.Pushkin West-Kazakhstan Humanities University
25. Dauletkerey West-Kazakhstan Institute of Arts
26. Kazakh State Academy of Management

[41] Указ Президента Республики Казахстан от 21 октября 2003 года N 1208 "О мерах по совершенствованию системы организации научной деятельности в Республике Казахстан"

[42] More information at http://phoenix.irc.ee

27. Kazakh State Architectural-and-Construction Academy
28. Kazakh State Academy of Arts
29. Zhurgenov Kazakh State Institute of Theatre and Cinema
30. Kazakh State Woman's Pedagogical Institute
31. Kazakh State University of World Languages
32. Kazakh State University of Law.
33. Kazakh Institute of Physical Culture.
34. Karagandy State University
35. Institute of Management and Economic Prognosing under the President of the Republic of Kazakhstan
36. Ch.Valikhanov Kokshetau University
37. A.Baitursynov Kostanay State University
38. Korkyt-ata Kyzy1orda Humanities University
39. S.Toraigyrov Pavlodar State University
40. North-Kazakhstan University
41. I.Zhansugurov Taldykorgan University
42. South-Kazakhstan Humanities University

[43]A powerful network of scientific entities has been developed. The Union of the scientists of Kazakhstan has been founded and Association of Higher educational institutions is working successfully.

Research evaluation and accreditation

Accreditation of research institutions started in 2003. In 2006 the a**uditing of Kazakhstan science was** implemented with the assistance of specialists from the USA. As a result of the auditing the most perspective directions in the development of science and the problems of science have been defined and 5 priorities have been chosen for science development:

• Biology,
• Nanotechnology,
• Mining and Metallurgy,
• Nuclear energy,
• Oil and Gas.

The process of **awarding scientific degrees and titles** is managed by the Committee on Supervision and Attestation in the sphere of education and science. There were 1106 senior Ph.D.s and 3018 Candidates of sciences in 2006.

By 2010 in Kazakhstan there would exist simultaneously both an old system of attestation of scientific staff and a new one in accordance with the Bologna model.

There are proposed three levels of scientific-research examination with specific procedures and institutions involved:

The **definition and correction of R&D priorities** would be conducted by International Expert Board on a 75/25 basis (75% foreign and 25% local experts).

The **development of scientific-research programs and evaluation of the results** would be done by the National Centre on Scientific Research Information together with the National Institution on Intellectual Copyright on a 60/40 basis (see above).

The **selection of projects for scientific research programs** would be conducted by Science Fund (for scientific and research works) and the National Innovation Fund (for sample test and design) compiled on a 25/75 basis (see above).

[43] Правительства Республики Казахстан от 19 мая 2003 года № 460 "Об утверждении Положения об аттестации научных организаций".

Future plans

- Promotion of Higher Scientific Research Commission's status and foundation of the International expert board;
- Foundation of the Committee on Science under the Ministry of Education and Science;
- Adoption of the State Program on the development of science to 2012, defining the sphere of public interests in science;
- Foundation of JSC "Science Fund" authorized to fulfil examination, selection, and financing scientific research programs and projects;
- Promotion of competition and transparency in granting scientific and technological projects by using external examination made by foreign and local experts;
- Development of transparent and legal mechanism of transference of copyright from patent to license in order to use the patent in the research funded by the state.

References

- On the Further Measures on Implementation of the Strategy of the Development of Kazakhstan to 2030. Decree of the President of RK of March, 30, 2006 N 80;
- Program of the Government of the Republic of Kazakhstan for 2007 - 2009
- On the Activity of JSC "Fund of Sustainable Development Kazyna" and National Institutions of Development;
- Presentation of the Minister of education and science of RK A. Abdymomunov of 21.04.06.
- Committee on Supervision and Attestation www.educontrol.kz
- Ministry of Education and Science of RK www.edu.gov.kz
- Report on auditing of Kazakhstani science held in 2006 in co-operation with Kazakh Institute of scientific and research information and the Academy of Science of the USA www.naukakaz.kz
- The system of higher education ahd educational standards in the Republic of Kazakhstan. Analytical Report. Moscow[44]

[44] Research Centre for the Problems of Quality in Specialists' Training, 2006. 112 pp.

Kyrgyzstan

Kyrgyzstan is both landlocked and mountainous. The country borders Kazakhstan to the north, Uzbekistan to the west, Tajikistan to the southwest and the People's Republic of China to the southeast.

Kyrgyzstan has been fairly progressive in carrying out market reforms, such as an improved regulatory system and land reform. Before 2005, Kyrgyzstan was described as an "island of democracy" in Central Asia, and earned plaudits from the IMF and World Bank[45] . Donors and international financial institutions rewarded the reform strategy with concessionary loans and grant assistance, representing a sizeable contribution to the budget. Kyrgyzstan was the first CIS country to be accepted into the World Trade Organization. Following the Georgian and Ukrainian revolutions, opposition forces overthrew their government in March 2005. Unlike the Georgians and the Ukrainians, however, the Kyrgyz opposition used violence, and in the post-revolutionary period failed to bring stability and order to the country. The new government has a major task to bring about internal stability.[46]

Migration is an issue, as 20-30,000 people annually leave the country, with seasonal labour in Russia and Kazakhstan as the main source of income for the poorest regions.

Unemployment is high, especially among young people and women and in former industrial/mining regions. The official unemployment rate was 9.9% in 2005, but the real figure is likely to be much higher due to unregistered unemployment.

Distribution by nationality is: 52.4% Kirghiz; 21.5% Russian, 12.9% Uzbek, 2.5% Ukrainian, 2.4% German, 8.3% Others.

64.7% of the Kyrgyz speaking people live in Kyrgyzstan, the others are located in Afghanistan, China, Kazakhstan, Tajikistan, Turkey (Asia), and Uzbekistan.

Figure. Language map of Kyrgyzstan and Tajikistan[47]

[45] The Macroeconomics of Poverty: A Case-Study of the Kyrgyz Republic. 2002. UNDP, Kyrgyz Republic.

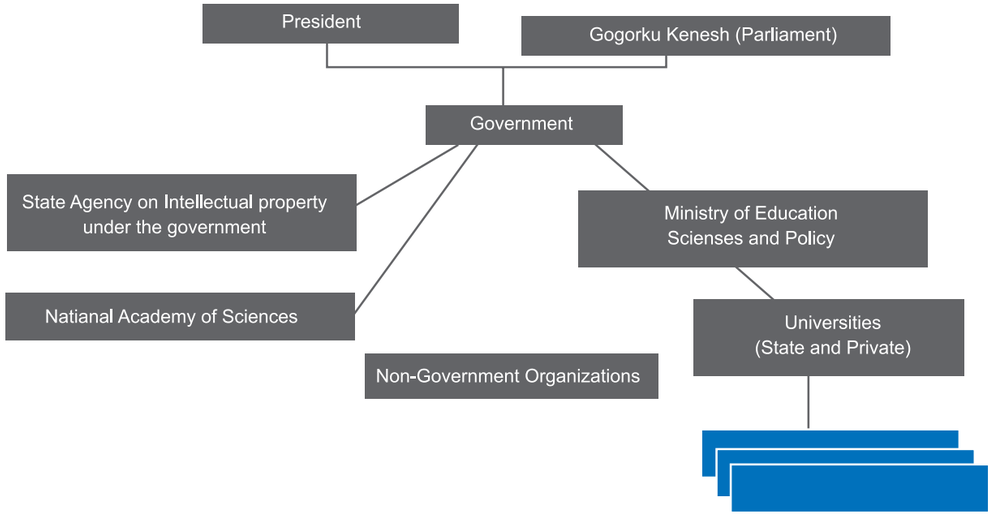
[46] Zeyno Baran, S. Frederick Starr, Svante E. Cornell. Islamic Radicalism in Central Asia and the Caucasus: Implications for the EU. Central Asia-Caucasus Institute and Silk Road Studies Program, 2006. 57 pp

[47] Gordon, Raymond G., Jr. (ed.), 2005. Ethnologue: Languages of the World, Fifteenth edition. Dallas, Tex.: SIL International. Online version: http://www.ethnologue.com/

Several historical monuments and landscapes have been taken under protection. Properties submitted on the Tentative List are:[48]Saimaly-Tash Petroglyphs (2001); Shakh-Fazil (2001); Uzgen (2001); Suleyman-Too (2001); Burana-Minaret (2001) and Issyk-Kul as a cultural and natural landscape (2001).

R&D System in Kyrgyzstan

The R&D system in Kyrgyzstan is supported by the Ministry of Education, Science and Youth Policies, Academy of Sciences of the Kyrgyz Republic. The Ministry is responsible for the organization of expert boards and the allocation of the budget. Independent expert boards deal with project selection and with monitoring the realization of these projects



At present the scientific potential of the Kyrgyz Republic is concentrated in 92 independent scientific and technical organizations: institutes, universities, scientific –production centres, temporary research groups, etc. The system of higher professional education of the country is represented by 49 higher educational institutions, with 32 state and 17 non-state ones. There are also six branches of foreign high education institutions (from Russia and Kazakhstan).

The main players of the science field in Kyrgyzstan are the research branch institutes of National Academy of Science (26 organizations). Scientific activity is organized through projects which have two to three year duration. Among the wide-ranging institutes of the NSA are the History Institute, the Language Institute and the Economical Researches centre. 31 state organizations of higher education and 16 non-governmental academic organizations as well as research and scientific centres established under them are coordinated by the Ministry of Education, Science and Youth Policies.

[48] http://whc.unesco.org/en/statesparties/

Table. General Statistics on national basis Kyrgyz Republic

Total number of researchers	2187
From these in Social Sciences	159
Humanities	156
Researchers per 1.000.000 inhabitants	414
Expenditure on R&D of GDP	0.2 %
Total R&D funding (in mill/Euro)	14.2
From this: Social Sciences	1.3 %
Humanities	1.3 %
Total number of higher educational institutions:	
Only universities	51
Including branches of the Universities	138
Total number of students:	231095
Among them	
Social Sciences	85603
Humanities	16430

Source: National Statistical Committee (2005)

The biggest universities in the country are Bishkek Humanitarian University, Kyrgyz-Russian Slavic University, Naryn State University and Issyk- Kul State University. Higher education institutes are administrated by the Management Academy. 9.7 percent of the entire non-governmental organization sector is involved in research, research evaluation and research monitoring. Some of the biggest institutions in the field are the Soros Foundation, the UNDP and the German political fund of F. Eberth. There are also several international organizations with offices in Kyrgyzstan, such as the Swiss Co-ordination Office.

Table. SSH institutions in Kyrgyzstan[49]

No	Name of institute
1.	Institute of History of National Academy of Sciences
2	Institute of Philosophy and Law of National Academy of Sciences
3	Institute of Linguistics of National Academy of Sciences
4	Department of Dungun Studies of National Academy of Sciences
5	Social Research Centre of National Academy of Sciences
6	Economic Research Centre of National Academy of Sciences
8	National Centre of Manas Studies and Arts Culture of National Academy of Sciences
9	Institute of Social Sciences of National Academy of Sciences
10	Institute of Education problems
11	State Centre of legal expertise
12	Institute of Statistic Research
13	Centre of Social and Economic Reforms
14	Academy of Arts
15	Institute of Humanities under the Bishkek Humanities University
16	Institute of Cultural Studies under the Osh State University
17	Institute for public Policy
18	Institute strategic research and forecast under the Kyrgyz-Russian Slavic University

Main research topics in SSH: political studies, gender, law, women studies, migration, folklore, archaeology, anthropology, national culture and language studies, linguistics, poverty, development economics, pedagogy, education**.**

[49] More information at http://phoenix.irc.ee

The main research field of the Institute of History are as following:

- Investigation of history of Kyrgyz people and Kyrgyzstan in view of revaluation and extended knowledge. The result of this work will be the issue of the new variant of the three-volume edition of Kyrgyz people and state history;
- Scientific study of realization of state program "Osh-3000"
- Applying research on solving of actual social, economical and political problems on the basis of the use of positive historical experience, development of school books for general education schools and higher education organizations;
- Archaeological study within the world program "Complex investigation of the Silk way – way of dialogue"
- Success projects:
- International archaeological expedition "Culture of medieval Ak-Beshim"
- Archaeological works on ancient settlement Krasnorechensk
- Publication of book "Kyrgyz plays and entertainments"

Research fields of the Institute of Philosophy and Law are:

- history and philosophy;
- anthology and theory of knowledge;
- social philosophy and spiritual culture problems;
- Philosophical tasks of the social environment.
- Logics of development of social consciousness in new geopolitical conditions;
- Phenomenology and immanent logic of the philosophical conception of the Kyrgyz people;
- Role of psychological culture in new historical conditions.
- Strategy of socio-political development of Kyrgyzstan: problems and perspectives;
- Intellectual culture of the Kyrgyz people and its aesthetic foundations;
- Philosophical foundations of ecological strategy transition period;
- Problems of state and law in the transition period.

Research fields of the Institute of Linguistics are:

- Regularities of functioning and developing of the Kyrgyz language, it's phonological and grammatical structure;
- Peculiarities of the Kyrgyz dialectology and lexicology;
- problems of interaction and inter-correlation of different languages;
- History and norms of the Kyrgyz literary language, culture of speech, etc. The main goal of the project is scientific and theoretical ensuring of development and functioning of state (Kyrgyz) language, and scientific and practical assistance for purposeful performance of language policy in republic.
- Research is conducted on three dimensions:
- 1) Main problems of standards of speech and functioning of grammatical categories of Kyrgyz literature language.
- 2) Functioning of state and official languages in mass media in the Kyrgyz Republic.
- 3) Phases of development and formation of Kyrgyz language vocabulary.
- Development of Kyrgyz national terminology.

Research directions of the Centre for Economic Research are:

- Mechanisms of the market economy, formation and development;
- Regularities of formation and development of effective forms of agrarian production;
- Socio-economic conditions of vital activity of Kyrgyzstan's population;
- Natural resources of Kyrgyzstan and the problems of their use in the conditions of transition to market relations;
- Research into obtaining ways and methods of steady and secure economic development;
- Macroeconomics aspects of the socio-economic policy;
- Shadow economy: analysis of its limits, structure, volume and possible ways of legalization;
- Monetary and financial system in the economic growth of the Kyrgyz Republic;
- Strategy of economical growth and reduction of poverty in Kyrgyzstan;
- Fiscal and taxation policy as the instrument of macro economical regulation and economical growth;

- Cost efficiency of rational use of natural resource for sustainable development of the economy of the Kyrgyz Republic;
- Problems of effective development of agrarian sector of Kyrgyzstan;
- Threats of economical safety of the Kyrgyz Republic and economical growth.

The basic tasks of the Department of Dungan Studies are:

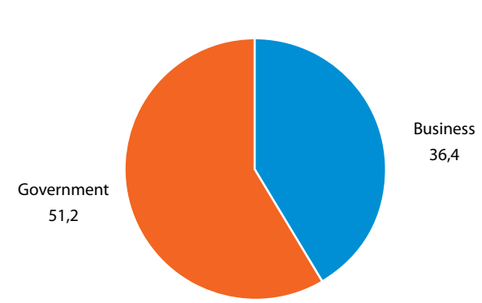
- Dungan (Muslim Chinese) ethnography and history, Dungan language, literature and Folklore
- Study of language, literature, culture of Dungan people living on the territory of the Kyrgyz Republic

State financing of R&D and Innovation is organized through:

- targeted financing (Academy of education, institute of higher education programs);
- R&D grants;
- maintenance of the infrastructure;
- national research and development programmes;
- support programmes for innovation

The National Science Academy is directly funded from the state budget, other institutions receive support from the Ministry of Education and Science and also several national and international funds. Money is allocated among fundamental and humanities (43.8%), medical science (35%), technical science and new technologies (18.1%), and agricultural sciences (3.1%).

Figure. Percentage distribution of Gross Domestic Expenditure on R&D by source of funds[50]



Total R&D funding for year 2007 was € 2.7 million. The Ministry of Education and Science is financing 114 projects to the sum of € 1.43 million. The proportion for Humanities is about 18%.

Problems and future plans: Computerization and effective use of information technology strongly influences the quality of education and efficiency of science research in Kyrgyzstan. However, the level of access to information of the National Science Academy is not high enough. Currently the focus in Kyrgyzstan's research institutions is upgrading infrastructure and electronic facilities.

[50] http://stats.uis.unesco.org/unesco/ReportFolders/ReportFolders.aspx

National Academy of Sciences (http://www.nas.aknet.kg)

Policies and Strategies

To overcome the fragmentation of Kyrgyz science and to raise its effectiveness and intellectual potential, the State Programme on the reforming of science in the Kyrgyz Republic for the period 2003-2005 was adopted.

The main aim of the State Programme was to transform science with the main recourse of renovation and development of the economy of the Republic. The main problems of the development of science in Kyrgyzstan are connected with a financing deficit.

Today one third of the budget funds allocated to science is spent on medical research and development, 16-17% is allocated to agricultural, technical and humanitarian sciences, and about 10% is assigned to biotechnology developments. As a whole, in 2004 scientific organisations and academia received 71.1% of the annual budget and 28.9% was allocated to fundamental research.

On 3 July 2003 the Presidium of National Academy of Sciences adopted the list of priorities of Kyrgyz science development.

In the area of physical and technical sciences, mathematics and geology:

1. Information-telecommunication technologies, electronics and problems of applied mathematics;
2. Physical and technical problems of energy, plasma and resource-saving technology;
3. Theory of machines and management, automation of technological processes and systems;
4. Rational nature management and natural water and energy resources;
5. Comprehensive analysis of natural and natural-man-caused processes in mountain regions, forecasting of disasters;

In the area of chemical-technological, medical-biological and agricultural sciences:

6. New materials and chemical technologies;
7. Bio-diversity and environment;
8. Mountain ecosystems' management and sustainable development of mountain population;
9. Molecular biology and biotechnology

In the area of social sciences:

10. Sustainable political, economical and social development of the Kyrgyz Republic;
11. National language, political and cultural genesis of nations of Kyrgyzstan;

Legislation

Starting from 2000, a full updating of the legislation in the Kyrgyz Republic is being carried out. The changes, which have been entered in the new legislation, are in some or other form connected with the world trends. The processes of globalization occur in the socio-economic and political spheres have affected the system of higher education and research of Kyrgyzstan.

- Law "About science and national scientifically-technical policy bases" (1994)
- Law "About scientifically-technical information system" (1999)
- Law "About obligatory copy of document" (1997)
- Law "About copyrighting and adjacent rights" from January, 14, 1998 Law about National Science Academy of KR from July, 25, 2002, #132
- Law "About information" from October, 8, 1999
- Law "About education" from April, 30, 2003, #92
- A new law project "About education" is under the Jogorku Kenesh (Kyrgyz parliament) consideration
- Law "About legal program security for computers and databases" from March, 30, 1998
- Law "About library affair" (1998)

Analysis, by Eurasia Foundation with financial support of United States Agency for International Development (USAID) in 2006, showed that Kyrgyz is still in a transition period when market relations in the country have not yet been formed, legislation lags behind practice and changing to international standards of higher education has a limited-formalized character.[51]

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Education and Science in the Kyrgyz Republic: Statistical collection. - Bishkek: National Statistical Committee KR, 2006

National Science Academy of the Kyrgyz Republic: Short annual report.2006/NSA KR. – Bishkek: Ilim, 2007 – 48 p.

KR Legislation about science

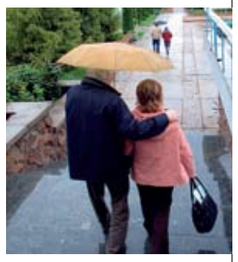
Report about the condition of science in the Kyrgyz Republic for the period 1991-2000, Bishkek: Kyrgyz patent. – 2001. Report is published with the financial support of UNESCO.

Jivoglyadov V.P. about the strategy of reforming the science system of the Kyrgyz Republic/Kyrgyzstan - 2005. Strategies and scenarios of development. Statistics and Materials collection. – B., 2005. - 126-136 p.

Data of Ministry of Education and Science KR. 2007

Kyrgyz Republic universities' materials about science and research activities in the HEIS.

[51] Report. Methodological basis for a comparative analysis of the quality of the educational process in business, econom ics, law and information technology programs in higher education institutions of the Kyrgyz Republic. Bishkek: USAID, June 2006



Tajikistan

Tajikistan is a mountainous landlocked country which borders Afghanistan to the south, Uzbekistan to the west, Kyrgyzstan to the north, and China to the east. Most of Tajikistan's population belongs to the Tajik ethnic group, who share culture and history with the Iranian peoples and Uzbek people and speak the Tajik language.

After the initial economic collapse following independence and civil war, signs of economic recovery began to appear in 1998 and since then the country has experienced continuously high growth rates. The civil war which lasted for 5 years (1992-97) caused a deep economic crisis and political instability, large losses of human lives, and serious infrastructural destruction. The majority of the working population, including highly qualified specialists, migrated to other countries for temporary or permanent residence, which has resulted in an acute need for qualified personnel.

A considerable brain drain of qualified cadres is linked to ongoing migration. Research shows that most out-migrants were specialists from the services sector such as education, science, culture, and medicine; the out-flow rate of the service sector was six times higher than that for engineers and technical workers[52]. Tajikistan faces a difficult demographic situation with a labour market that is not capable of absorbing the present 'working age' population of. High birth rates over the last few decades have resulted in a 'working age' population of which increased from about 2.5 million in 1991 to 3.9 million in 2004. During the same period official employment remained virtually unchanged at just under 2 million, with a low of 1.7 million in 1999. This difficult situation caused a sharp increase in the share of the population working in the informal sector, and caused mass seasonal labour migration to Russia and Kazakhstan in particular, and generated widespread poverty. In 2002 an estimated 65% of the population lived below the national poverty line. Remittances from migrants constitute the main income in many households and make up a significant share of GNI.

With about 47% of the population under the age of 15, the influx into the labour market will continue to be high in years to come. There are about 120,000 new entrants to the labour market every year. Because about half of young people leave after compulsory education (grade 9) and a further estimate of 25,000 leave after upper secondary general education, a large proportion of the young enter the labour market without any specific qualifications. In 2004, the economy is estimated to have grown over 10%. However, the total size of the economy remains well below its 1990 level and industry in particular has found it difficult to recover.

Distribution by nationality is: 64.9% Tajik, 25.0% Uzbek, 3.5% Russian, and 6% others.

The Tajik speaking Diaspora has spread to Iran, Kazakhstan, Kyrgyzstan, Russia (Asia), Turkmenistan, Ukraine, Uzbekistan. Tajik is the official language, an ancient Persian language similar to the languages of Iran and Afghanistan. In the Pamir Mountains, there are at least five different languages, all related to an even more ancient form of Iranian. Russian is widely used (35% of the population speak Russian fluently). Uzbek is also spoken.

Several historical monuments and landscapes have been taken under protection. Properties submitted on the Tentative List are[53]: Mausoleum of "Amir Khamza Khasti Podshoh" (1999), The Site of Ancient Town of Takhti-Sangin (1999), The Site of Ancient Town of Baitudasht IV (1999), Mausoleum of "Khoja Mashkhad" (1999), Buddhistic cloister of Ajina-Tepa (1999), Palace of the governor of Khulbuk (1999), Mausoleum of "Hodja Nashron" (1999), The Site of Ancient Town of Pyanjekent (1999), Mausoleum of "Mukhammad Bashoro" (1999), The Site of Ancient Town of Shahristan (Kahkakha) (1999), Neolithic Settlement Sarazm (2000), Tajik National Park (2006), Fann mountains (2006), Tigrovaya Balka (2006), Zakaznik Kusavlisay (2006), State reserve Dashti Djum (2006), Zorkul State Reserve (2006).

R&D System in Tajikistan

The central body of scientific research in the Republic of Tajikistan is the Academy of Sciences. In 2006 several reforms were conducted in order to improve the quality of research in the country. These reforms included the creation of a state unitary enterprise which deals with infrastructure and research equipment and also several administrative orders dealing with increasing the quality of research.

[52] Labour migration from Tajikistan, July, 2003. IOM in cooperation with the Research Centre «Shark», p.30

[53] http://whc.unesco.org/en/statesparties/

The scientific institutions of the Academy of Sciences are united into four departments: physics and mathematical, chemical and geological, biological and medical and social sciences. The department of social sciences unites the following institutes: Language and Literature Institute, Oriental Study and Written Heritage Institute, History Institute, Archaeology and Ethnography Institute, Philosophy Institute, State and Law Institute, Economy Institute and Humanities Institute.

General Statistics on national basis

Total number of researchers:	4891
From these in	
Social Sciences	213
Humanities	267
Researchers per 1,000,000 inhabitants	691
Expenditure on R&D as a % of GDP[3]	0.1063%
• **Total R&D funding (in EURO)**	**1138514**
From this:	
• Social Sciences (%)	6
• Humanities (%)	8,1
Total number of higher educational institutions: **only universities** **Including branches of the universities**	36
Total number of students	132405
Among them from	
Social Sciences	35928
Humanities	63421

The Coordination Council is confirming the research priorities of the research institutions.

The main research activities in Tajikistan are concentrated into Academy of Sciences Institutes.

Table. SSH institutions in Tajikistan[54]

1. Institute of Demography of the Academy of Sciences of Tajikistan
2. Institute of Economy of the Academy of Sciences of Tajikistan
3. Institute of History, Ethnography and Archeology of the Academy of Sciences of Tajikistan
4. Institute of Humanities of the Academy of Sciences of Tajikistan
5. Institute of Language and Literature of the Academy of Sciences of Tajikistan
6. Institute of Oriental Studies and Written Heritage of the Academy of Sciences of Tajikistan
7. Institute of Philosophy of the Academy of Sciences of Tajikistan
8. Institute of State and Law of the Academy of Sciences of Tajikistan
9. Khatlon scientific center of the Academy of Sciences of Tajikistan
10. Khujand scientific center of the Academy of Sciences of Tajikistan
11. Tajik State University of Commerce
12. Russian-Tajik Slavonic University
13. Tajik Pedagogical University

[54] http://phoenix.irc.ee

R&D policy

During the last seven years, the main goal for Tajikistan was to stabilize its education system. The Government has adopted ten State Programs, five National Plans and a number of projects in the education sphere, which are to be implemented in the coming five to ten years. They are aimed at the modernization of the education system, improving education quality and training of personnel, improvement of the process of teaching, solution to gender issues, and other goals. All these programs have less than 50% of their resources allocated from local resources, the balance being contributed by external donors.

The main reform and development activities envisioned for higher education development are[55]:

- Creating a local information management system between universities with Internet access.
- Implementing a student loan finance system in Dushanbe, Khujand, GBAO and Kurgantube.
- All forms of teacher refresher courses for teachers of higher education.
- Teacher training courses for the provision of distance learning and the design and implementation of a distance-learning program.
- The arrangement of the permanently functioning courses at the universities for the teachers aimed at learning and implementing the information-communication technologies in the education process, develop the state program, and provide 1 computer for every 25 students in the humanities and 1 for 10 students in technical, economic and natural specialties. For language and pedagogical universities up to 400 computers total and for medical and agricultural universities up to 300 computers total.
- Postgraduate student grants for postgraduate studies (3-5 students annually).
- Overseas education scholarships for university students (15 annually).
- Equip higher education institutions with modern training-laboratory equipment and visual aids.
- Gradual renewal of equipment in higher education institutions (10 percent annually).
- Gradual replenishment of library funds (10 percent annually).

In 2006 **S&T Strategy plan for 2007-2015 was** adopted. The main objectives of the S&T Strategy plan for 2007-2015 are:

- To define aims and priority objectives of S&T;
- To define priority areas in R&D;
- To define statues and structure of research institutions;
- Concentration of S&T potential to achieve the most important results which are needed for social-economic development of the country.

The same year (2006) the Decree of the Government of the Republic of Tajikistan on Academy of Sciences was adopted. The main objectives are:

- to create the Centre of Accreditation
- to creation of Centre for financing academic research;
- to establish the State research prizes
- To establish basis for expertise, financing and leading of research programmes and projects.

[55] National Strategy for Education Development of the Republic of Tajikistan. Part 4: NSED Financial Resource Framework

List of main Concepts, Programs and Action Plans of Education system (linked with R&D)

1. State Program of ecological upgrading and education of the population of the republic of Tajikistan up to 2000 and for the prospective till 2010 (1996);
2. National Action Plan for improving the situation with women in the Republic of Tajikistan for 1998-2005годы. (1998)
3. State Program "Main directions of state policy for ensuring equal rights and opportunities for men and women in the Republic of Tajikistan for 2001-2010" (2001).
4. National Concept of education (2002)
5. Program of realization of the concept of State demographic policy in the Republic of Tajikistan for 2003-2015. (2002)
6. State Program of improvement of teaching and learning of the Russian and English languages in the republic of Tajikistan. (2003)
7. Program of economic development of the Republic of Tajikistan up to 2015 (2004)
8. Plan of implementation of education system reform for 2004-2009 (2004.)
9. State Program of training pedagogical cadres for 2005-2010 (2004)
10. National Strategy for Education Development of the Republic of Tajikistan (2006-2015) (2005)

Legislation basis of R&D

1. Decree of the Government of the Republic of Tajikistan of February 23, 1996, # 93 "On State Program of ecological upbringing and education of the Population of the republic of Tajikistan up to 2000 and for the prospective up to 2010".
2. Decree of the Government of the republic of Tajikistan of February 23, 1996, # 96 "On approval of a State standard of higher vocational education".
3. Decree of the Government of the Republic of Tajikistan of June 4, 1997, #266 "On approval of State standards for education".
4. Decree of the Government of the Republic of Tajikistan of September 10, 1998, # 363, "National action Plan for improving situation of women in the republic of Tajikistan, upgrading women's status and role for 1998-2005".
5. Decree of the President of the Republic of Tajikistan of December 3, 1999, #№5 "On enhancing role of women in the society".
6. Decree of the Government of April 19, 2001 #1992 "On order of enrolment of girls into higher educational institutions under the Presidential quarter for 2001-2005"
7. Decree of the Government of the Republic of Tajikistan of August 8, 2001, # 391, a state program "Main directions of state policy for ensuring equal rights of men and women in the Republic of Tajikistan for 2001-2010"
8. Decree of the Government of the Republic of Tajikistan of May 3, 2002, # 200 "National education concept".
9. Constitution of the Republic of Tajikistan (2003).
10. Law of the Republic of Tajikistan of June 30, 2003, # 902 "On higher and post graduate vocational education".
11. Decree of the Government of the Republic of Tajikistan of August 4, 2003, # 344 «On changes and amendments into indicators of Presidential quarter for enrolment of girls (without exams) to higher educational institutions of the Republic of Tajikistan for 2001-2005".
12. Decree of the President of the Republic of Tajikistan of November 2003, #1174, a State strategy "Information and communication technologies for the development of the Republic of Tajikistan".
13. Decree of the Government of the republic of Tajikistan of December 2, 2003, #508 "On approval of state Program for teaching and learning of the Russian and English languages in the Republic of Tajikistan".
14. Law of the Republic of Tajikistan "On education" (adopted on 27 December 1993, partially amended in 1994, 1995, 1996, 1997, 2003,) currently effective version was adopted on 17 May 2004
15. Decree of the Government of the Republic of March 1, 2004, # 86 "Program of economic development of the Republic of Tajikistan for the period until 2015".
16. Decree of the Government of the Republic of Tajikistan of June 30, # 291 "On the Plan of realization of education system reform for 2004-2009".
17. Decree of the Government of the Republic of Tajikistan of November 1, 2004, #25 "On state Program of training of pedagogical cadres for 2005-2010".
18. Decree of the Government of the Republic of Tajikistan of December 3, 2004, # 468 "On approval of the state program of training of pedagogical cadre's for2005-2010"
19. Law of the Republic of Tajikistan of March 1, 2005, # 389 "On State guarantees of equality between men and women and equal opportunities for their realization".
20. Law of the Republic of Tajikistan "On Higher and Postgraduate professional education" (June 2003).

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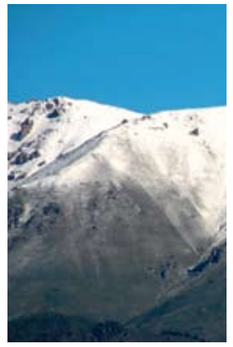
Site of the Ministry of Education of the Republic of Tajikistan

http://www.education.tj/



Turkmenistan

Turkmenistan has common borders with the Islamic Republic of Iran, the Islamic Republic of Afghanistan, the Republic of Kazakhstan, and the Republic of Uzbekistan. The Caspian Sea is the western natural border of the country with the Russian Federation and the Azerbaijan Republic.

Nearly 80% of the country consists of the Kara-Kum (Black Sand) desert, the largest in the CIS. The longest irrigation canal in the world stretches 1,100km (687 miles), from the Amu-Darya River in the east, through Ashgabat, before being piped the rest of the way to the Caspian Sea.

Distribution by nationality is: 73.3% Turkmen, 9.8% Russian, 9.0% Uzbek, 2.0% Kazak, 5%, and 9% others.

Turkmen is also spoken in Afghanistan, Iran, Iraq, Kazakhstan, Kyrgyzstan, Pakistan, Russia (Asia), Tajikistan, Turkey (Asia), and Uzbekistan. Turkmen is the official state language, and is closer to Turkish, Azeri and Crimean Tartar than those of its neighbours Uzbekistan and Kazakhstan. The Turkmen script was changed from Latin to Cyrillic in 1940, but the process of changing back to the Turkish version of the Latin script is underway.

Several historical monuments and landscapes have been taken under protection. Properties inscribed on the World Heritage List: [56]Kunya-Urgench (2005), Parthian Fortresses of Nisa (2007), State Historical and Cultural Park "Ancient Merv" (1999), and the Property submitted on the Tentative List is: Dehistan / Mishrian (1998). Ancient Merv is good example of cooperation between different organizations - **the World Monuments Fund, the J.M. Kaplan Fund, American Express, the Arts and Humanities Research Council, the Max van Berchem Foundation and the British Embassy in Ashgabat. They initiated Ancient Merv Project[57] which** was established in March 2001. This project started as a five-year (2001-2005) collaboration between the Institute of Archaeology, UCL and the State Historical and Cultural Park Ancient Merv, part of the National Department for the Protection, Study and Restoration of Historical and Cultural Monuments within the Ministry of Culture of Turkmenistan. In 2002 this was extended to include a five-year collaboration (2002-2006) with The State Institute of Cultural History of the Peoples of Turkmenistan, Central Asia and the East.

R&D System in Turkmenistan

Funding

The Turkmen State is the main donor of research in Turkmenistan.

The sources of funding of science and technology are:

- Science and technology fund of Turkmenistan;
- The enterprises, organizations and associations funds.
- International foundations and grants.
- Public foundations.

Table. General Statistics on national basis

Total number of researchers:	3488[58]
Researchers per 1,000,000 inhabitants[2]	684
Total number of higher educational institutions	16[59]
Among them have Curricula for	
Social Sciences	16
Humanities …	16
Total number of students	15300[60]

[56] http://whc.unesco.org/en/statesparties/

[57] http://www.ucl.ac.uk/merv/Ancient%20Merv%20Project/index.htm

[58] Data of 2004 y. Statistical Yearbook of Turkmenistan 2000-2004. Ashgabat,2005. Turkmen National Institute of State Statistic and Information.

[59] Data of 2004 y. Statistical Yearbook of Turkmenistan 2000-2004. Ashgabat,2005. Turkmen National Institute of State Statistic and Information.

[60] Data of 2004 y. Statistical Yearbook of Turkmenistan 2000-2004. Ashgabat,2005. Turkmen National Institute of State Statistic and Information.

State policy in the Science and Educational fields.

The Government of Turkmenistan is a general supervisor of the state policy in the science and educational fields.

The Supreme Council of Science and Technology [61] under the President of Turkmenistan is the Coordinator of the state policy in the science and educational fields (Art.11 at the Law of Turkmenistan "On State Science and Technology Policy" 1992").

The Supreme Council on Science and Technology establishes of a scientific and educational network including:

- Providing of access to the Internet;
- Build up of the ICT potential for a Science and Education;
- Development of a network infrastructure;
- Transformation of scientific and educational information to electronic form;
- Creation of National scientific and educational information electronic data base;
- Supporting of network interaction of the scientific and educational institutions.

The Council is also the main expert body for evaluating research results of research institutions, groups and individual researchers.

One of the priority tasks of the science and technology policy is involving the youth to the science and research activity with aid from the students in the different disciplines.

The Ministry of Education of Turkmenistan is responsible for the realization of the Main directions of State educational policy.

The General principles of the Educational policy of Turkmenistan adopted in the National President's Program "Bilim"(May 3, 1993).

The Universities and schools are the main clusters for realization of the National Program "Bilim".

The main purpose of Educational policy is to develop a professional level of higher qualified specialists, and a maximum combination theory and practice.

The Ministry of Education of Turkmenistan

[61] Supreme Council of Science and Techniques: http//: www.science.gov.tm

There are 16 Universities and Institutions in Turkmenistan:

1. Turkmen State University named after Magtymguly;
2. Turkmen Agricultural University named after S.A.Nyyazov;
3. International Turkmen – Turkish University;
4. Academy of Arts;
5. Academy of Police;
6. Military Institute;
7. Turkmen State Institute of Culture;
8. Turkmen National Institute of World languages;
9. Turkmen Institute of National Economy;
10. Turkmen State Institute of transport and communication;
11. National Institute of sport and tourism;
12. Turkmen State Conservatory;
13. Turkmen State Medical Institute;
14. Turkmen State Pedagogical Institute;
15. Turkmen Polytechnic Institute;
16. Turkmen State Energy Institute.

Priority directions of researches in SSH:

- History;
- Archaeology;
- Cultural legacy,
- Pedagogy and Education,
- Literature,
- Economy;
- Gender Studies.

Normative and Legal base of Science and Educational Development.

The Constitution of Turkmenistan (1992, amended of 2005)

The Constitution of Turkmenistan declared the rights of Citizens for education. Every Citizen has the right to receive free education in the State schools. The State provides access to the Universities and professional education. Organizations and citizens have the rights to establish fee-paying schools according to Turkmen Law.

The Law of Turkmenistan "On State Science and Technology Policy" (1992).

The Law of Turkmenistan"On State Science and Technology Policy" opens perspectives for development science and research activity in the all State and Public fields. Also, this Law provides great opportunities in choosing its disciplines.

The Law of Turkmenistan "On Science Intellectual activity" (1992)

The Law of Turkmenistan "On Education" (1993)

The Law of Turkmenistan "On Education" declares common secondary education for everybody. The Ministry of Education has special Institute of Education, which is responsible for development of curricula, methodological standards for educational system and for its expertise.

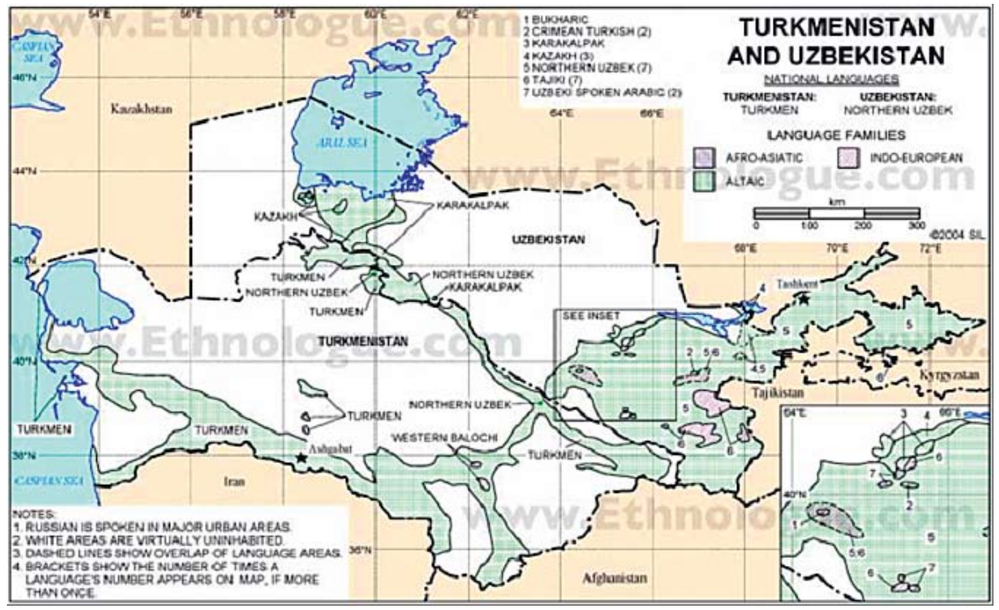
Uzbekistan

Uzbekistan is a dry, landlocked country of which 11% consists of intensely cultivated, irrigated river valleys. More than 60% of its population lives in densely populated rural communities. Uzbekistan is now the world's second-largest cotton exporter, a large producer of gold and oil, and a regionally significant producer of chemicals and machinery.

Distribution by nationality is: 71.4% Uzbek, 8.3% Russian, 4.7% Tajik, 4.1% Kazakh, 2.4% Tatar, 2.1% Karakalpak, 7.0% others.

Uzbek is spoken also in China, Kazakhstan, Kyrgyzstan, Russia (Asia), Tajikistan, Turkey (Asia), and Turkmenistan. The official language is Uzbek, which is closely related to Kazak and Kyrgyz. There is a small Russian-speaking minority and Uygur minority. The Cyrillic script was changed to the Latin in the 1990s.

Figure. Language map of the Turkmenistan and Uzbekistan[62]



Several historical monuments and landscapes have been taken under protection. Properties inscribed on the World Heritage List [63]: Historic Centre of Bukhara (1993), Historic Centre of Shakhrisyabz (2000), Itchan Kala (1990), Samarkand – Crossroads of Cultures (2001). Properties submitted on the Tentative List: Complex of Sheikh Mukhtar-Vali (mausoleum) (1996), Arab-Ata in Tim (mausoleum) (1996), Khakim Al-Termizi (complex) (1996), Kyrk Kyz (palace building) (1996), Vabkent's Minaret (1996), Djarkurgan's Minaret (1996), Rabati Melek (complex) (1996), Ishrathona (mausoleum) (1996), Chor-Bakr (complex) (1996), Bakhautdin (ensemble) (1996), Khanbandi (dam) (1996), Ak Astana-baba (mausoleum) (1996), Gur-Emir (ensemble) (1996), Mir Said Bakhrom (mausoleum) (1996), Registan (ensemble) (1996), Shakhi-Zinda (complex) (1996), Ulughbek's observatory (1996).

Research & Development Institutions and Human Resources

Nearly 34,000 people work in the scientific sphere, including 2,800 Ph.D.s and approximately 16,100 Candidates of sciences. The research complex of the Republic comprises 362 institutions of academic, university and economic profile. The leading scientific and experimental centre in the region is The Academy of sciences of the Republic of

[62] Gordon, Raymond G., Jr. (ed.), 2005. Ethnologue: Languages of the World, Fifteenth edition. Dallas, Tex.: SIL International. Online version: http://www.ethnologue.com/

[63] http://whc.unesco.org/en/statesparties/

Uzbekistan, which has a history of more than half a century.

Education is multilingual; studies are held in Uzbek, Russian and Karakalpak languages, and in special areas in Kazakh, Kyrgyz and Tadjik languages.

Table. General Statistics on national basis

Total number of researchers:	33614
From these in	
Social Sciences	4542
Humanities	4935
Researchers per 1,000,000 inhabitants[2]	1200
Total number of higher educational institutions: **only universities** **Including branches of the universities**	63
Among them have Curricula for	
Social Sciences and Humanities	42
Total number of students	263600

There are two academic degrees in Uzbekistan: Candidate of Science and Doctor of Science. As of today, there are 24 branches of science where it is possible to defend a thesis. In turn, each branch is divided into a series of specialties, each with its own code.

	2001	2002	2003	2004
Number of personnel				
Research staff	36132	36528	34899	33614
Studies involved in research and development	24677	26294	25904	25556
Doctorates among research staff	2024	2178	2248	2269
Candidates among research staff	8514	8904	8837	8578
Number of postgraduate students	3362	2891	2584	2188
Postgraduate admissions	873	810	699	576
Postgraduate commencement	927	1036	789	682
Dissertation defence	145	133	59	88

Source: UNDP CO Uzbekistan, 2006.

State of social sciences and humanities in Uzbekistan

Studies on world and domestic history, cultural and spiritual heritage, historical and modern development of Uzbek language, literature and Uzbekistan folklore are taking place.

Also, works connected with studying ethno-genesis and reconstructing objective history of Uzbek folk, studying its traditions, ways of life and cultures are an exclusive interest.

Table. State of social sciences and humanities in Uzbekistan (philosophy, law, sociology, political science and history). Theses given expertise by Certification Commission in 2006.

No:	Examined Works	Approved Theses	Philosophy	Law	History	Political Sciences	Sociology	Rejected Theses
1	Doctoral thesis	28	7 *25%*	7 *25%*	7 *25%*	6 *21.5%*	1 *3,5*	1 history 1 philosophy**.**
2	Candidates dissertation	80	17 *21.25%*	32 *40%*	21 *26.25%*	8 *10%*	2 2.5%	
3	for Professor's rank	7	-	2	2	3	-	-
4	for Associate Professor's rank	22	7	10	3	2	-	-
6	Notification	3	1 Candidate 1 Assistant professor		1 Doctor.	**-**	**-**	**-**
7	TOTAL	**140**	**33**	**51**	**37**	**19**	**3**	**2**

Chart. The share of different social and humanitarian directions among the doctoral theses Approved in the year 2006.

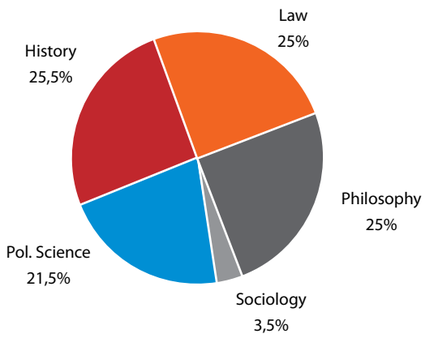


Table. The number of Theses defended in the field of Social science and Humanities in 2006

Field	**No**
History of Uzbekistan	**21**
Social philosophy	**16**
Civil law; family law; international law and law of persons	**15**
Penal law; criminology, corrective labour	**11**
Political institutions and processes	**7**
Criminology, criminalistics, forensic examination	**5**
Theory, methods and history of sociology	**2**

Financing

For the period from 2003 to 2005 for higher educational establishments the government allocated 3,665 million EUR. Distribution of the sum among the Ministries is as follows:

- Ministry of higher and secondary special education – 2.823 million EUR;
- Ministry of health – 289,200 EUR;
- Ministry of agricultural and water industry – 256,000 EUR;
- Ministry of public education – 60,933 EUR
- Other Ministries – 198,733 EUR.

National strategies and programs in the field of science

In 2002 the Coordinating Committee on Scientific and Technical Development was formed under the Cabinet Council in execution of the Decree entitled 'On Improvement of Organization of Research Activity'.

The Coordinating Committee performs the following tasks:

- Definition of priority directions in fundamental and applied scientific research and technology developments, coordinating it with the strategy of development of economic sectors and social sphere
- Organization of expertise large scientific research programs and technological projects, proceeding from their conformity to the national interests
- Approval of projects for large scientific programs and technological projects
- Approval of the annual State Program of Scientific Research and Technological Developments.
- Creation of the system of support for talented scholars to generate innovative ideas and keeps abreast with the new and promising trends in the world science

The Science and Technology Centre is working under the Coordinating Committee and performing the following tasks:

- Working out the project for the annual State Program of Scientific Research and Technological Developments within the frames approved by the Coordinating Committee priority directions of science and technology development;
- Organization and carrying out tenders for realization of fundamental and applied research in the priority directions of science and technology;
- System analysis of working of the scientific institutions with the purpose of ensuring most rational use of intellectual force and financial resources allotted for scientific research;
- Carrying out systematic work on improvement of organization of science development and innovative activities, the main point being making suggestions on closing the subject areas which become obsolete and making suggestions on opening new subject areas relevant to modern course of the scientific and technical progress;
- Creation favourable conditions for professional growth of talented and promising scholars, using target grants, in-depth training courses abroad and other forms of support;
- Promoting introduction of the scientific and technical developments into production process, making incentives for the management of the enterprises from real sectors of economy to develop innovative activity, financing and co-financing scientific research.
- Development of international cooperation in science and technology, attraction of foreign investment, sponsor means and grants for carrying out scientific research, technological developments and innovation projects.

Legislation

Decree of the President of the Uzbek Republic "About improvement of coordination and management of the R&D. 7 August 2006

http://www.press-service.uz/ru/gsection.scm?groupId=4347&contentId=23201

The Law of the President of the Uzbek Republic "About improvement of the organisation of R&D"

20 February 2002.

http://academy.uz/old/rus/news/news_ukaz.html

The Law about Education. 29 August 1997, N 464-I

http://www.edu.uz/modules/wfdownloads/singlefile.php?cid=48&lid=879

National programme on preparation of cadres 29 August 1997. http://www.edu.uz/modules/wfdownloads/visit.php?cid=48&lid=944

Decree of the Cabinet of the Ministers' of the Republic of Uzbekistan „ About strengthening scientific. Material basis of the Academy of Sciences. 09 July 2004

http://2004.press-service.uz/rus/documents/uk09072004.htm

Decree of the Cabinet of the Ministers' of the Republic of Uzbekistan „About state support to develop international cooperation in S&T"

Conclusions

Central Asia is extremely interesting from point of view history and culture. And it is foreseen that in very near future it will be one of the favourites among tourists. Up till now several cultural heritage conservation projects along the Silk Roads have been launched (the site of Fayaz Tepe in Uzbekistan, the Otrar project in Kazakhstan, and the Krasnaya Rechka, Chuy Valley sites project in Kyrgyzstan, the Buddhist Monastery of Ajina Tepe in Tajikistan). Nine properties from Central Asia are included into World Heritage List.

Since independence most of the Central Asian countries have passed through several economic reforms. As in all the former Soviet Union countries, their research systems have suffered huge losses. By now all Central Asia countries are crossed the downfall. The human development index trends tell an important story in that aspect. All Central and Eastern Europe and the Commonwealth of Independent States (CIS), following a catastrophic decline in the first half of the 1990s, have recovered to the level before the reversal. By now all Central Asia countries are modernising and reforming their research and education systems. But the situation of researchers is still very bad; it concerns their salaries, and research infrastructures.

Meanwhile, as all countries have discussed the situation, and are aware with it, we may expect that national governments can improve the living standards of university staff and researchers. Especially in the case, that all of them have declared the importance of reforms.

Despite the harsh decrease in the number of researchers and the decline in Research and Development funding throughout the region there are first class research centres, which are able to cooperate on level terms.

ARCHIMEDES
foundation

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