



STRATEGIC REVIEW SURVEY

PRELIMINARY REPORT

Kyiv
October, 2006



General Survey Description

At the 22nd Governing Board Meeting, the STCU was instructed to conduct a data gathering exercise in support of the GB Strategic Review. The goal was to gather basic data on the STCU's primary mandate: engaging and redirecting former WMD and delivery system scientists.¹ The Secretariat developed (with Governing Board member input) the following three groups of information, along with specific questions to aid in gathering data and information within each information groups:

- Data Set A: Evaluation of the Current Situation of Former Soviet WMD Scientists
- Data Set B: Evaluation of the Current Situation of Former Weapons R&D Institutes
- Data Set C: Evaluation of Scientist Population

The Data Sets and related questions are provided in Annex A of this report, and the data gathered in response are provided in subsequent Annexes.

Key Preliminary Findings:

1. According to STCU database records, a **total number of 17,724 former weapons scientists (FWS)** have been registered with STCU across all STCU Beneficiary Parties.
2. The rate at which STCU is seeing new FWS names “appear” has been declining since 2001-2002, with the largest declines in Category 1 (WMD) scientists (50-65% decrease) and delivery systems (40% decline).
3. The total number of FWS and non-weapon scientists (NFWS) who received grants from STCU Regular or Partner Projects is **14,479 (8364 FWS and 6115 NFWS)**. In Ukraine – 12,795 (7500 FWS and 5295 NFWS), Azerbaijan – 128 (82 FWS and 46 NFWS), Georgia – 434 (261 FWS and 173 NFWS), Moldova – no STCU funded projects, Uzbekistan – 1122 (521 FWS and 601 NFWS).
4. Since the STCU programs began: 205 scientists have participated in STCU Targeted Initiative Projects; 109 in STCU Partner Promotion Roadshows (including Party-directed missions); 900 in STCU Training events; 450 received an STCU Travel Support Grant; and 730 received an STCU Patent Support Grant.
5. There have been 21 institutes involved in STCU Targeted Initiative Projects; 13 institutes in the STCU Chief Technology Commercialization Officer program; 76 institutes which hosted a CIDA Trade Mission visits/meeting; 64 which had scientists in a STCU Partnership Promotion Roadshow; and 34 institutes which received STCU Conference Support funds for conferences it hosted/organized.
6. Across all the Beneficiary Parties, there are 382 institutions and organizations which have had scientists that participated in STCU projects.
7. The average age of FWS is 58 years old, of all STCU project participants – 53.

¹ This is information that the STCU Secretariat feels might not be captured in other information-gathering efforts, such as the STCU-NASU Institute Sustainability Survey and the future U.S.-sponsored “Ball-Gerber” study on the impact of STCU and western grant assistance to Ukrainian scientists. While these other studies might also provide some data that could partially answer the data needs listed here, these other studies should contribute additional information that will be important to the Governing Board strategic discussions

8. At the present time, FWS mostly work in their home scientific institutes for as long as they can, with 47% of them retiring at age 60-65, and 11% retiring at age 75 and up. State pension payments range from \$45-\$160 in the Beneficiary Parties and the pension situation is not improving.
9. In general, it appears that the majority of students graduating from technical institutes/universities today are choosing career directions not normally associated with WMD or military delivery systems R&D. The most popular directions in scientific and technical careers today are humanitarian and social sciences, machinery, economics, management and administration. This implies that there will be little or no major increase in the number of scientists and technicians in the Beneficiary Parties with the education and skills that were used in the Soviet era for WMD and advanced military technology development.

Description of Data Gathering Activities

Sources of Information

Data gathered so far comes from the following sources:

- 50% of data was found in the STCU internal project databases (refer to Annex A, Questions A2, B1, B3, C2) and program activity records (Annex A, Questions A3, B4).
- For the rest data (Annex A, Questions A1, B2, B5, B6, C1, C3) STCU made an official request with attached questionnaire to follow Host Government Agencies:

Ukraine – Request sent to the State Statistics Committee and to the National Academy of Sciences of Ukraine. The State Committee responded that it could not answer the STCU-provided questions because "...the information is not developed by Committee".² No response was received from National Academy of Sciences. The Dobrov Center for Scientific & Technological Potential (NASU) proposed to conduct this survey on behalf of National Academy of Sciences of Ukraine on a contract basis, but no decision on this proposal has been made.

Azerbaijan – Request sent to the Azeri Academy of Sciences and to the Azeri Cabinet of Ministers. No official response was received from either the Academy of Sciences or Cabinet of Ministers. However, the STCU Regional Office in Azerbaijan communicated directly with Azeri institutes and provide a data summary based on these unofficial discussions.

Georgia - Request sent to the Georgian National Science Foundation and the Ministry of Education and Sciences of Georgia. STCU received official data from the National Science Foundation³.

Moldova - Request sent to the Moldovan Academy of Sciences. STCU received official data with cover letter from the Academy of Sciences⁴.

Uzbekistan - STCU chose not send any official request to the Government of Uzbekistan due to current political sensitivities in the STCU-Uzbek Government relationship.

²Letter dated 13 September 2006 from Mr. Yu. M. Ostapchuk, Deputy Head, State Statistics Committee of Ukraine

³Email with attachment, dated 9 October 2006 from Mr. A. Motsonelidze, Director, Georgian National Science Foundation

⁴Letter dated 6 October 2006 from Dr. G. Duca, President, Academy of Sciences of Moldova

ANNEX A: DATA SETS AND RELATED QUESTIONS

Data Set A: Evaluation of the Current Situation of Former Soviet WMD Scientists

Question #1: What is the current best estimates of (a) the number of experienced, Soviet-era, former WMD scientists (FWS) in 1995, and (b) the number of experienced, Soviet-era, former WMD scientists (FWS) currently employed at institutes or universities?

(Definition: experienced, Soviet-era FWS = scientists or technicians who, between the years 1960 and 1991, worked for 2 years or longer on a Soviet military project directly connected to the design/development of nuclear, chemical, or biological weapons, ballistic missile systems, anti-ballistic missile systems, or directed energy weapon systems):

Ukraine = #
Azerbaijan = #
Georgia = #
Moldova = #
Uzbekistan (? - might not be possible to get permission for this number)

Data Source: Host Government Agencies.

Question #2: For each year from 1995 until 2006 (up to 18 May 2006), what is the total number by of distinct individual FWS (total sum and total number in each Weapon Code) and NFWS (total sum) who were participating in a funded STCU Regular or Partner Projects?

Ukraine = #
Azerbaijan = #
Georgia = #
Moldova = #
Uzbekistan (? - might not be possible to get permission for this number)

Data Source: STCU Secretariat (Databases)

Question #3: Of the identified FWS on STCU funded and unfunded projects, how many If, participated m (a) an STCU Targeted Initiative Project, (b) an STCU Partner Promotion Roadshow (including Party-directed missions), (c) participated in an STCU Training event, (d) (d) received an STCU Travel Support Grant, or (e) received an STCU Patent Support Grant?

Data Source: STCU Secretariat (Databases)

Data Set B: Evaluation of the Current Situation of Former Weapons R&D Institutes?

Question #1: What is list of institutes, universities, and technical units (a) who had researchers engaged in a funded STCU project (Regular or Partner)? List these organizations by country, city, name of institute, and put them in rank order according to the total number of distinct FWS identified on all registered STCU projects/proposals (funded or unfunded).

Data Source: STCU Secretariat (Databases)

Question #2: For each of these institutes, what is the (a) total number of researchers currently working there (scientists, laboratory technicians, post-graduate students)?, (b) total number of researchers that can be categorized as FWS (according to the FWS definition above), and (c) total number of "young scientists" (i.e., age 30 or less)

Data Source: Host Government Agencies/Institutes

Question #3: For each of these listed organizations, what is the total number and total, dollar/euro amount of (a) funded STCU Regular Projects, (b) STCU Governmental Partner Projects, and (c) STCU Non-Governmental Partner Projects?

Data Source: STCU Secretariat (Databases)

Question #4: For each of these listed organizations, which were ever involved in an (a) STCU Targeted Initiative Project, (b) the STCU Chief Technology Commercialization Officer program, (c) hosted CIDA Trade Mission visits/meeting, (d) STCU Partnership Promotion Roadshow, or (e) received STCU Conference Support funds for conference it hosted/organized?

Data Source: STCU Secretariat (Databases)

Question #5: For each institute with a significant number of FWS (i.e., those with 33% of its employed researchers qualifying as FWS or more than 100 FWS), what is the estimated percentage of the institute's annual budget income that comes from (a) state funds, (b) non-STCU international grants, (c) STCU grants, (d) commercial sources.

Data Source: Host Government Agencies/Institutes

Question #6: In the opinion of institute directors, what is the present situation with retirement of scientist, particularly former military scientists? Is the pension system improving such that it is getting easier for scientists to enter full retirement with sufficient financial support? What is the current average pension payments received by senior scientists? Notwithstanding the minimum age for receiving state-provided pensions, what is the average age at which scientists (particularly former military scientists) are likely to fully retire from active employment?

Data Source: Selected Institute Directors, Host Government Information

Data Set C: Evaluation of Scientist Population

Question #1: What is the average age of the scientist community in each country?

Ukraine = #

Azerbaijan = #

Georgia = #

Moldova = #

Uzbekistan (? - might not be possible to get permission for this number)

Data Source: Host Government Agencies

Question #2: What is the average age of scientists who are STCU project participants? What is the average age of STCU, project participants categorized as FWS?

Data Source: STCU Secretariat (Partial information from Databases, Institute Survey)

Question#3: What are the main directions in scientific/technical career fields being pursued by senior students/recent graduates of technical universities and institutes? What is the trend in these directions: an generally increasing or decreasing number of students in each career field?

In answering this question, identify those career paths hat are closely connected to military fields of activity.

Data Source: Host Government Agencies

ANNEX B: SUMMARIZED RESULTS

DATA SET A: EVALUATION OF THE CURRENT SITUATION OF FWS

Set A. Question #1. What is the current best estimates of (a) the number of experienced, Soviet-era, former WMD scientists (FWS) in 1995, and (b) the number of experienced, Soviet-era, former WMD scientists (FWS) currently employed at institutes or universities?

a) the **number** of experienced, Soviet-era, former weapon scientists (**FWS**) in 1995:

Ukraine – *no data*

Azerbaijan – 1596

Georgia – 4500

Moldova – 1010

Uzbekistan – *no data*

b) The **number** of experienced, Soviet-era, **FWS** currently **employed** at institutes or universities:

Ukraine – *no data*

Azerbaijan – 803

Georgia – 3000

Moldova – 401

Uzbekistan – *no data*

Data Source: *Host Government Agencies*

Set A. Question #2. For each year from 1995 until 2006 (up to 18 May 2006), what is the total number by of distinct individual FWS (total sum and total number in each Weapon Code) and NFWS (total sum) who were participating in a funded STCU Regular or Partner Projects?

The total **number** by of distinct individual **FWS** (total sum and total number in each Weapon Code) and **NFWS** (total sum) who were participating in a **funded** STCU Regular or Partner Projects (*see Weapon Code names in Azerbaijan table*) for each year from 1995 until 2006 (up to 18 May 2006):

Ukraine – 12 795 (7 500 FWS + 5 295 NFWS)

Azerbaijan – 128 (82 FWS + 46 NFWS)

Georgia – 434 (261 FWS + 173 NFWS)

Moldova – no projects were funded

Uzbekistan – 1 122 (521 FWS + 601 NFWS)

Total – 14 479 (8364 FWS + 6115 NFWS)

UKRAINE

Name	Years											Total
	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	
FWS, total	478	1305	1706	2127	2037	2630	3154	3703	3440	2929	2537	26046
incl. new	478	827	409	854	730	906	932	892	526	462	484	7500
incl. new FWS by weapon code												
1.1 – Nuclear Weapons	51	152	51	142	156	161	135	129	115	75	33	1200

1.2 Chemical Weapons	22	44	50	72	61	193	77	77	21	18	24	659
1.3 Bacteriological Weapons	5	11	6	12	40	39	24	43	30	11	17	238
1.4 Other WMD-Related Weapon Technologies	12	8	15	33	12	22	16	21	13	11	15	178
2.1 Missile Technologies	144	206	122	349	131	170	250	200	176	185	189	2122
2.2 Guidance Systems	80	251	101	113	199	218	220	229	95	68	80	1654
2.3 Other Delivery Systems	19	10	23	24	19	9	35	32	13	9	5	198
3.1 ABM Recognition Sys.	23	55	5	24	31	22	36	48	20	30	19	313
3.2 ABM Guiding Sys.	9	7	8	3	17	9	9	14	8	5	5	94
3.3 Other ABM Sys.	35	5	1	6	4	1	10	5	2	4	6	79
4.1 Other non-WMD Weapons	78	78	27	76	60	62	120	94	33	46	91	765
NFWS, total	521	1028	1324	1324	1346	1624	1838	2173	1927	1759	1644	16508
incl. new	521	507	336	479	557	570	541	624	357	437	366	5295
Total in years	999	2333	3030	3451	3383	4254	4992	5876	5367	4688	4181	42554
incl. new	999	1334	745	1333	1287	1476	1473	1516	883	899	850	12795

AZERBAIJAN

Name	Years		Total
	2005	2006	
FWS, total	28	82	110
incl. new	28	54	82
incl. by weapon code			
1.1 Mass destruction weapon - Nuclear	4	-	4
1.2 Mass destruction weapon - Chemical	5	7	12
1.3 Mass destruction weapon - Bacteriological	-	7	7
1.4 Mass destruction weapon - Others	-	1	1
2.1 Delivery systems - Missile technologies	-	2	2
2.2 Delivery systems - Guiding systems	-	8	8
2.3 Delivery systems - Others	-	-	-
3.1 ABM systems - Recognition systems	8	12	20
3.2 ABM systems - Guiding systems	-	-	-
3.3 ABM systems - Others	1	-	1
4.1 Other weapons - Terrestrial	10	17	27
NFWS, total	17	46	63
incl. new	17	29	46
Total in years	45	128	173
incl. new	45	83	128

GEORGIA

Name	Years								Total
	1999	2000	2001	2002	2003	2004	2005	2006	
FWS, total	6	25	28	42	83	141	144	176	645
incl. new	6	19	3	20	44	74	48	47	261
incl. new FWS by weapon code									
1.1	-	-	3	9	17	7	16	14	66

1.2	-	-	-	-	7	13	5	1	26
1.3	-	-	-	-	9	36	-	11	56
1.4	6	1	-	-	1	-	3	1	12
2.1	-	-	-	2	5	9	9	7	32
2.2	-	17	-	9	5	5	8	6	50
2.3	-	-	-	-	-	3	1	-	4
3.1	-	-	-	-	-	1	3	-	4
3.2	-	1	-	-	-	-	-	-	1
3.3	-	-	-	-	-	-	-	-	-
4.1	-	-	-	-	-	-	3	7	10
NFWS, total	3	14	15	20	47	74	90	129	392
incl. new	3	11	1	8	27	38	34	51	173
Total in years	9	39	43	62	130	215	234	305	1037
incl. new	9	30	4	28	71	112	82	98	434

MOLDOVA – No Data Available Due to Lack of Active STCU Projects

UZBEKISTAN

Name	Years									Total
	1998	1999	2000	2001	2002	2003	2004	2005	2006	
FWS, total	7	32	60	74	140	202	262	344	373	1494
incl. new	7	25	36	32	67	82	89	128	55	521
incl. new FWS by weapon code										
1.1	1	9	10	19	11	36	14	18	13	131
1.2	-	1	1	-	12	18	7	16	11	66
1.3	1	-	-	3	6	6	12	15	-	43
1.4	-	10	-	-	3	2	14	12	5	46
2.1	4	3	12	-	4	8	9	4	3	47
2.2	1	-	1	4	14	4	7	8	14	53
2.3	-	-	1	4	2	-	9	-	-	16
3.1	-	1	2	-	13	-	-	29	-	45
3.2	-	1	-	1	-	1	2	1	-	6
3.3	-	-	-	-	1	-	-	2	-	3
4.1	-	-	9	1	1	7	15	23	9	65
NFWS, total	6	39	69	72	100	191	283	409	487	1656
incl. new	6	33	37	14	42	122	104	152	91	601
Total in years	13	71	129	146	240	393	545	753	860	3150
incl. new	13	58	73	46	109	204	193	280	146	1122

TOTAL (all STCU Beneficiary Parties Combined, except for Moldova)

Name	Years											Total
	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	
FWS, total	478	1305	1713	2165	2122	2732	3336	3988	3843	3445	3168	28295
incl. new	478	827	416	885	785	941	1019	1018	689	666	640	8364
NFWS, total	521	1028	1330	1366	1429	1711	1958	2411	2284	2275	2306	18619
incl. new	521	507	342	515	605	585	591	773	499	640	537	6115
Total in years	999	2333	3043	3531	3551	4443	5294	6399	6127	5720	5474	46914
incl. new	999	1334	758	1400	1390	1526	1610	1791	1188	1306	1177	14479

Data Source: STCU Secretariat (Databases)

Set A. Question #3. Of the identified **FWS** on STCU **funded** and **unfunded** projects, how many If, **participated** in (a) an STCU Targeted Initiative Project, (b) an STCU Partner Promotion Roadshow (including Party-directed missions), (c) participated in an STCU Training event, (d) (d) received an STCU Travel Support Grant, or (e) received an STCU Patent Support Grant?

a) an STCU Targeted Initiative Project -	205 for period 2005 - 2006
b) an STCU Partner Promotion Roadshow (including Party-directed missions) -	109 1999 - 2006
c) participated in an STCU Training event -	900 1999 - 2006
d) received an STCU Travel Support Grant -	450 1998 - 2006
e) received an STCU Patent Support Grant -	730 1998 - 2006

Total 2394

Data Source: *STCU Secretariat (Databases)*

DATA SET B: EVALUATION OF THE CURRENT SITUATION OF FORMER WEAPONS R&D INSTITUTES

Set B. Question #1. What is list of institutes, universities, and technical units (a) who had researchers engaged in a funded STCU project (Regular or Partner)? List these organizations by country, city, name of institute, and put them in rank order according to the total number of distinct FWS identified on all registered STCU projects/proposals (funded or unfunded).

Number of **institutes with funded** projects and **FWS (funded or unfunded)** working in these institutes:

Countries	# of organizations	# of scientists
Ukraine	304	15930
Azerbaijan	15	189
Georgia	21	709
Moldova	No Funded Projects	No Data Available
Uzbekistan	42	896
Total	382	17724

Data Source: *STCU Secretariat (Databases)*

Set B. Question #2. For each of these institutes, what is the (a) total number of **researchers** currently working there (scientists, laboratory technicians, post-graduate students)?, (b) total number of researchers that can be categorized as **FWS** (according to the FWS definition above), and (c) total number of "young scientists" (i.e., age 30 or less)

No	Country	Total number of researchers currently working there	Total number of FWS	Total number of "young scientists" age 30 or less
1.	Ukraine	no data	no data	no data
2.	Azerbaijan	2434	641	369
3.	Moldova	2128	401	328
	Georgia	3237	1191	748
4.	Uzbekistan	no data	no data	no data
	Total	7799	2233	1445

Data Source: *Host Government Agencies*

Set B. Question #3. For each of these listed organizations, what is the total number and total, dollar/euro amount of (a) funded STCU Regular Projects, (b) STCU Governmental Partner Projects, and (c) STCU Non-Governmental Partner Projects?

The total **number** and total dollar/euro **amount** of projects:

#	Organization	Funded regular			Governmental Partner			Non-Governmental Partner		
		#	USD	EURO	#	USD	EURO	#	USD	EURO
382	Total	1169	79,560,441	18,127,939	192	28,526,807	1,125,123	138	14,000,446	366,037

Total: 1499 projects for \$122,087,694 and 19,619,099 EURO

Data Source: *STCU Secretariat (Databases)*

Set B. Question #4. For each of these listed organizations, which were ever involved in an (a) STCU Targeted Initiative Project, (b) the STCU Chief Technology Commercialization Officer program, (c) hosted CIDA Trade Mission visits/meeting, (d) STCU Partnership Promotion Roadshow, or (e) received STCU Conference Support funds for conference it hosted/organized?

Number of organizations, which were ever **involved** in:

a) STCU Targeted Initiative Project -	21
b) the STCU Chief Technology Commercialization Officer program -	20
c) hosted CIDA Trade Mission visits/meeting -	76
d) STCU Partnership Promotion Roadshow -	64
e) received STCU Conference Support funds for conference it hosted/organized -	34

Total 215

Data Source: *STCU Secretariat (Databases)*

Set B. Question #5. For each institute with a significant number of FWS (i.e., those with 33% of its employed researchers qualifying as FWS or more than 100 FWS), what is the estimated percentage of the institute's annual budget income that comes from (a) state funds, (b) non-STCU international grants, (c) STCU grants, (d) commercial sources.

Estimated **percentage** of the institute's annual **budget** income:

#	Organization	State funds	Non-STCU international grants	STCU grants	Commercial sources	%
	Ukraine	59	11	20	10	100
	Azerbaijan	55	6	14	25	100
	Georgia	43	27	15	15	100
	Moldova	60	10	-	30	100
	Uzbekistan	no data	no data	no data	no data	-
	Average value	54	14	12	20	100

Data Source: *Host Government Agencies
Data from STCU survey (2005)*

Set B. Question #6: In the opinion of institute directors, what is the present situation with retirement of scientist, particularly former military scientists? Is the pension system improving such that it is getting easier for scientists to enter full retirement with sufficient financial support? What is the current average pension payments received by senior scientists? Notwithstanding the minimum age for receiving state-provided pensions, what is the average age at which scientists (particularly former military scientists) are likely to fully retire from active employment?

a) describing the present situation with retirement of scientists, particularly former military scientists:

Today FWS work in research institutes.

Scientists do not fully retire from active employment at retire age because:

- than longer scientist works, than larger the pension payment is (in Ukraine);
- working scientists may take part in international programs (like Targeted Initiative Project, Partner Promotion Roadshow, Travel Support Grant, Patent Support Grant, Chief Technology Commercialization, CIDA Trade Mission);
- working scientists may take part in international conferences;
- working scientists may be granted from such organizations like STCU;
- scientists can be busy with favorite occupation.

b) is the pension system improving such that it is getting easier for scientists to enter full retirement with sufficient financial support?

Yes No

c) the current average pension payments received by senior scientists, USD

UKRAINE The pension payments depend of seniority (work standing). Person who has 30 years of standing receive 90% of salary like pension payments.

Name	pension payments	average salary
Academician	400 + 600 (grant)	500
Doctor of sciences	400	400
PhD	160-300	340
Senior scientists	160-300	340

AZERBAIJAN Pension payments are fixed.

Name	pension payments	average salary
Academician	350 (grant included)	100 + 350 (grant)
Doctor of sciences	45	85
PhD	40	85
Senior scientists	30	60

GEORGIA Pension payments are fixed.

Name	pension payments	average salary
Academician	20 + 200 (grant)	500-1000
Doctor of sciences	20 + 55 (grant)	120
PhD	20 + 40 (grant)	120
Chief scientists	20 + 30 (grant)	100

MOLDOVA The pension payments depend of seniority (work standing).

Name	pension payments	average salary
Academician	90	380
Doctor of sciences	65	260

PhD	54	200
Senior scientists	45	150

UZBEKISTAN: No Data Available to STCU

d) notwithstanding the minimum age for receiving state-provided pensions, there is the average age at which scientists (particularly former military scientists) are likely to fully retire from active employment:

UKRAINE

Age	%
60 / 65	28
65 – 75	60
75 and up	12

GEORGIA

Age	%
60 / 65	40
65 – 75	58
75 and up	2

AZERBAIJAN

Age	%
60 / 65	47
65 – 75	42
75 and up	11

MOLDOVA

Age	%
60 / 65	15
65 – 75	80
75 and up	5

UZBEKISTAN: No Data Available to STCU

Data Source: *Selected Institute Directors, Host Government Agencies*

DATA SET C: EVALUATION OF SCIENTIST POPULATION

Set C. Question #1. What is the average **age** of the scientist **community** in each country?

Ukraine = 47 (unofficial data)
 Azerbaijan = 45 (unofficial data)
 Georgia = 54
 Moldova = 50
 Uzbekistan = No Data Available to STCU

Data Source: *Host Government Agencies*

Set C. Question #2. What is the average age of scientists who are STCU project participants? What is the average age of STCU, project participants categorized as FWS?

a) The average **age** of STCU project **participants** - **53**
 b) The average **age** STCU project participants categorized as **FWS** - **58**

Data Source: *STCU Secretariat (Partial Information from Databases, Institute Survey)*



Set C. Question #3. What are the main directions in scientific/technical career fields being pursued by senior students/recent graduates of technical universities and institutes? What is the trend in these directions: a generally increasing or decreasing number of students in each career field? *In answering this question, identify those career paths that are closely connected to military fields of activity.*

Main directions of student's study:

increase	decrease
Information science Natural sciences Humanitarian and social sciences Education Economics, management and administration Biotechnology Medicine Materials Science Information technology IC design, electronics for power saving technologies	Environment and engineering Agriculture – fish-farming Machinery Physics, Chemistry, Mathematics Engineering sciences

UKRAINE

There is increasing of Information science. Technical institutes train for the humanities: economics, law. 80% of students of technical institutes do not work at specialty field after graduated. There is decreasing from 70% to 50% in working in technical fields.

AZERBAIJAN

Main directions in scientific/technical career fields	increase	decrease
Natural sciences	√	
Humanitarian and social sciences	√	
Education	√	
Economics, management and administration	√	
Environment and engineering		-
Machinery		-
Agriculture – fish-farming		-
Ecology and nature management	√	

GEORGIA

Main directions in scientific/technical career fields	increase	decrease
Biotechnology	√	
Medicine	√	
Materials Science	√	
Information technology	√	
Physics, Chemistry, Mathematics		-
Engineering sciences		-

MOLDOVA

Main directions in scientific/technical career fields	increase	decrease
IC design, electronics for power saving technologies	√	
Semiconductors physics	√	
Biotechnology	√	
Medical technique	√	
Renewable energetic resources	√	

UZBEKISTAN: No Data Available to STCU

Data Source: *Host Government Agencies*



ANNEX C: OFFICIAL RESPONSES (IN DETAIL) FROM GEORGIA

QUESTIONNAIRE SURVEY FOR GOVERNING BOARD OF STCU (by State Organizations and Institutions)

This information is needed by Governing Board to Facilitate the Strategic Discussion on STCU Future Mission Programming, 2006

Definition: experienced, Soviet-era FWS = scientists or technicians who, between the years 1960 and 1991, worked for 2 years or longer on a Soviet military project directly connected to the design/development of nuclear, chemical, or biological weapons, ballistic missile systems, anti-ballistic missile systems, or directed energy weapon systems. Code of FWS status confirming is attached.

1. What is the current best estimates of:

a) the number of experienced, Soviet-era, former WMD scientists (FWS) in 1995

4500

b) the number of experienced, Soviet-era, former WMD scientists (FWS) currently employed at institutes, state universities, or other technical units

3000

2. For each of these institutes, what is the (a) total number of researchers currently working there (scientists, laboratory technicians, post-graduate students)?, (b) total number of researchers that can be categorized as FWS (according to the FWS definition above), and (c) total number of “young scientists” (i.e., age 30 or less)

№	Name	Total number of researchers currently working there	Total number of FWS	Total number of “young scientists” (i.e., age 30 or less)
5.	Durmishidze Institute of Biochemistry and Biotechnology	75	40	15
6.	Eliava Institute of bacteriophages, Microbiology and Virology	90	45	18
7.	Tavadze Institute of Metallurgy and Materials Science	83	50	10
8.	Tsulukidze Institute of Mining and Technology	80	30	10
9.	Agladze Institute of Inorganic Chemistry and Electrochemistry	120	40	36
10.	Georgian Technical University...	1000	300	300
11.	Andronikashvili Institute of Physics	100	48	20
12.	Sokhumi I. Vekua Physical Technical Institute	48	36	5
13.	Institute of Cybernetics	150	120	12
14.	Tbilisi State University	350	160	100
15.	Tbilisi Medical University	400	120	110
16.	National Center of Deceases Control	120	50	20
17.	High Technology National Center (ISI)	100	80	20
18.	A. Tsereteli Kutaisi State University	500	60	70
19.	Optica	21	12	2
	Total			

3. For each institute with a significant number of FWS (i.e., those with 33% of its employed researchers qualifying as FWS or more than 100 FWS), what is the estimated percentage of the institute’s annual budget income that comes from: a) state funds, b) non-STCU international grants, c) STCU grants, d) commercial sources

#	Organization	State funds	Non-STCU international grants	STCU grants	Commercial sources	
1.	Durmishidze Institute of Biochemistry and Biotechnology	20	30	50	0	100%
2.	Eliava Institute of bacteriophages, Microbiology and	20	40	30	10	100%



	Virology					
3.	Tavadze Institute of Metallurgy and Materials Science	30	0	70	0	100%
4.	Institute of Mining and Technology	45	50	5	0	100%
5.	Agladze Institute of Inorganic Chemistry and Electrochemistry	90	0	10	0	100%
6.	Georgian Technical University...	25	20	5	50	100%
7.	Andronikashvili Institute of Physics	50	30	20	0	100%
8.	Sokhumi I. Vekua Physical Technical Institute	55	45	0	0	100%
9.	Institute of Cybernetics	60	40	0	0	100%
10.	Tbilisi State University	73	17	3	7	100%
11.	Tbilisi Medical University	75	10	0	15	100%
12.	High Technology national center	0	5	0	95	100%
13.	Optica	30	50	20	0	100%
14.	A. Tsereteli kutaisi State University	48	5	0	47	100%
15.	National Center of Deceases Control	20	70	10	0	100%
	Average value					100%

4. In the opinion of institute directors:

a) what is the present situation with retirement of scientists, particularly former military scientists?

Approximately 25% of scientists have now stipendiums. Former military scientists have high scientific level and all former military scientists continue to work in institute.

b) is the pension system improving such that it is getting easier for scientists to enter full retirement with sufficient financial support

Yes No

c) what is the current average pension payments received by senior scientists, local currency

less than 700 1500 – 2000 2500 – 3000
700 – 1500 2000 – 2500 3000 – and more

d) notwithstanding the minimum age for receiving state-provided pensions, what is the average age at which scientists(particularly former military scientists) are likely to fully retire from active employment

Age	mark	%
60, 65	65	40
65 – 75	70	10
75 and up		2-3

5. What is the average of the scientist community?

52-55

6. Job placement of recent graduates/senior students

a) what are the main directions in scientific/technical career fields being pursued by senior students/recent graduates of technical universities and institutes

b) what is the trend in these directions: an generally increasing or decreasing number of students in each career field (mark variant in column)

Main directions in scientific/technical career fields	increase	decrease
biotechnology	+	
Medicine	+	
Materials Science	+	
Information technology	+	
Physics, Chemistry, Mathematics		+
Engineering sciences		+

Note: In answering this question, identify those career paths hat are closely connected to military fields of activity



ANNEX C: OFFICIAL RESPONSES (IN DETAIL) FROM MOLDOVA

QUESTIONNAIRE SURVEY FOR GOVERNING BOARD OF STCU (by State Organizations and Institutions)

This information is needed by Governing Board to Facilitate the Strategic Discussion on STCU Future Mission Programming, 2006

Definition: experienced, Soviet-era FWS = scientists or technicians who, between the years 1960 and 1991, worked for 2 years or longer on a Soviet military project directly connected to the design/development of nuclear, chemical, or biological weapons, ballistic missile systems, anti-ballistic missile systems, or directed energy weapon systems. Code of FWS status confirming is attached

1. Data of the investigated institutions and organizations from science and innovation sphere of the Republic of Moldova

- a) Total number of the researchers currently engaged at 20 institutions and organizations (15 from state sector and 5 from state + private sectors): **2 128**
- b) Number of the experienced, Soviet-era, former WMD scientists (FWS) in 1995: **1 010**
- c) Number of the experienced, Soviet-era, former WMD scientists (FWS) currently employed: **401**

2. Organizations and institutions' information:

No	Organization	Total number of researchers currently working there	Actual total number of FWS	Total number of FWS in 1995	Total number of "young scientists" (i.e., age 30 or less)
State institutions and organizations					
20.	Institute of Mathematics and Computer Science	48	12	19	21
21.	Institute of Applied Physics	157	60	100	36
22.	Institute of Electronics Engineering and Industrial Technologies	64	29	45	26
23.	Institute of Power Engineering	55	2	7	2
24.	Institute of Genetics and Plant Physiology	146	13	18	34
25.	Institute of Chemistry	69	3	11	10
26.	Institute of Microbiology and Biotechnology	61	2	2	14
27.	Institute of Food Technologies	35	2	2	3
28.	Scientific Research Association in Agricultural Technique	75	6	7	15
29.	Industrial Management Systems Development Center "Cesid"	14	12	70	1
30.	Centre of Metrology and Scientific Analytical Methods	12	1	-	1
31.	Scientific and Applied National Centre for Preventive Medicine	59	4	4	8
32.	State Medical and Pharmacy University „N. Testemitanu”	828	63	56	19
33.	Technical University of Moldova	292	61	86	96
34.	State University of Moldova	80	31	44	21
	Total (state sector)	1995	301	471	307
Cooperative Associations (state + private sectors)					



35.	Scientific Research Institute "Rif – Acvaaparar" (Balti)	52	52	156	-
36.	Special Design and Technology Office "Mezon"	27	24	275	3
37.	Centre of Science and Engineering Informinstrument	36	12	86	7
38.	Institute of Scientific Research "Eliri"	11	10	17	10
39.	Amo Tec R&D enterprise, Ltd	7	2	5	1
	Total (state+private sector)	133	100	539	21
	Total	2 128	401	1 010	328

3. Estimated percentage of the institution's annual income:

№	Organization	State funds	Commercial sources	International grants	%
16.	Institute of Mathematics and Computer Science	76	5	19	100%
17.	Institute of Applied Physics	81	16	3	100%
18.	Institute of Electronics Engineering and Industrial Technologies	86	12	2	100%
19.	Institute of Power Engineering	86	12	2	100%
20.	Institute of Genetics and Plant Physiology	59	19	22	100%
21.	Institute of Chemistry	82	14	4	100%
22.	Institute of Microbiology and Biotechnology	100	-	-	100%
23.	Institute of Food Technologies	75	-	25	100%
24.	Scientific Research Association in Agricultural Technique	12	88	-	100%
25.	Industrial Management Systems Development Center "Cesid"	-	100	-	100%
26.	Centre of Metrology and Scientific Analytical Methods	72	28	-	100%
27.	Scientific and Applied National Centre for Preventive Medicine	97	-	3	100%
28.	State Medical and Pharmacy University „N.Testemitanu”	82	3	15	100%
14.	Technical University of Moldova	55	2	43	100%
15.	State University of Moldova	91	1	8	100%
	Average value	63	24	13	100%
Coopretative Associations (state + private sectors)					
16.	Scientific Research Institute "Rif – Acvaaparar" (Balti)	-	100	-	100%
17.	Special Design and Technology Office "Mezon"	-	90	10	100%
18.	Centre of Science and Engineering Informinstrument	-	90	10	100%
19.	Institute of Scientific Research "Eliri"	2	63	35	100%
	Average value	1	86	13	100%

4. Actual situation with retirement of scientists, particularly former military scientists:

- The pension isn't sufficient for scientists to enter full retirement.
- The current average pension payments received by senior scientists is: **45 USD**
- The average age at which scientists (particularly former military scientists) are likely to fully retire from active employment is: **65-75**

5. The average age of the scientific community is: **50**

6. Job placement of recent graduates/senior students:

Main directions in scientific/technical career fields being pursued by senior students/recent graduates of technical universities and institutes	increase
IC design, electronics for power saving technologies	√
Semiconductors physics	√
Biotechnology	√
Medical technique	√
Renewable energetic resources	√

Note: In answering this question, it was identified those career paths that are closely connected to military fields of activity.