CENTRAL ASIA EARTHQUAKE RISK REDUCTION FORUM

Forum Proceedings

Almaty, Kazakhstan

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GFDRR

Global Facility for Disaster Reduction and Recovery

WORLD BANK GROUP

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ACKNOWLEDGEMENTS

Thank you everyone who contributed their time, participation and ideas to the 2015 Central Asia Earthquake Risk Reduction Forum. While we cannot mention all organizations and individuals involved in the planning and execution of the event, we would like to highlight some of the key contributors:

First of all, we would like to extend our gratitude to the Governments of the Republic of Kazakhstan, Kyrgyz Republic, Republic of Tajikistan, Turkmenistan, and Republic of Uzbekistan for nominating delegates to present and participate in the Forum. We would also like to thank international organizations, such as Arup, ECHO, GFZ Postdam, Japan International Cooperation Agency (JICA), Swiss Red Cross, United Nations Development Programme (UNDP), UNESCO, and the United Nations Office for Disaster Risk Reduction (UNISDR), for making their contributions to the Forum. A special thank you goes out to the distinguished keynote speakers, session moderators and participants, which are all listed in the participants list.
We would like to thank the Government of Japan and the Global Facility for Disaster Reduction and Recovery (GFDRR) Disaster Risk Management Hub, Tokyo, for their support of the event.

Lastly, we would like to give a special thank you to the World Bank team that helped make the Forum possible: Mr. Rakhymzhan Assangaziyev, Ms. Karlygash Armina, Ms. Oxana Barysheva, Ms. Dana Bimenova, Mr. Jack Campbell, Mr. Rinat Iskhakov, Ms. Shynar Jetpissova, Mr. Timur Jurkashev, Ms. Tolkun Jukusheva, Ms. Keiko Sakoda Kaneda, Ms. Haruko Nakamatsu, Mr. Oleg Mashkin, Ms. Maryia Markhvida, Mr. Faridun Sanginov, Mr. Vigen Sargsyan, Mr. Kubat Sydykov, Mr. Oraz Sultanov, Mr. Ko Takeuchi, Mr. Joaquin Toro and Ms. Yekaterina Tsvilling.

LIST OF ABBREVIATIONS

CAIAG	Central Asian Institute for Applied Geosciences
DIPECHO	EU Humanitarian Aid and Civil Protection's disaster preparedness programme
DRM	Disaster risk management
DRR	Disaster risk reduction
ECHO	EU Humanitarian Aid and Civil Protection Department
EMCA	Earthquake Model Central Asia
GEM	Global Earthquake Model
GFDRR	Global Facility for Disaster Reduction and Recovery
GFZ	Helmholtz Centre Potsdam GFZ German Research Centre for Geosciences
GNP	Gross National Product
IOM	International Organization for Migration
ISMEP	Istanbul Seismic Risk Mitigation and Emergency Preparedness Project
JICA	Japanese International Cooperation Agency
JSC	Joint-stock Company
MoES	Ministry of Emergency Situations
SDC	Swiss Development Cooperation
UNDP	United Nations Development Programme
UNISDR	United Nations Office for Disaster Risk Reduction
WHO	World Health Organization

CENTRAL ASIA EARTHQUAKE RISK REDUCTION FORUM OVERVIEW

Central Asia is a region vulnerable to many natural hazards, of which earthquakes are one of the most catastrophic ones. Historically, Kazakhstan, Kyrgyz Republic, Tajikistan, Turkmenistan and Uzbekistan have been devastated by a number of earthquakes that caused huge economic and human losses. In 1948, Ashgabat, Turkmenistan, and the nearby areas were shattered by a magnitude 7.3 earthquake. The city saw extreme ground shaking, which caused most of it to be destroyed, leaving around 110,000 people dead. About a year later, the 1949 Khait earthquake occurred in Tajikistan, triggering massive landslides throughout the area and causing an estimated 12,000 deaths. A magnitude 6.4 earthquake occurred in Andijan, Uzbekistan, in 1902, destroying over 40,000 houses and claiming more than 4,500 lives. In Kazakhstan, the city of Almaty experienced many earthquakes, including the earthquake of 1911, which killed over 450 people. In the past 25 years, Kyrgyz Republic has seen numerous earthquakes with magnitudes above 6.0, one of which happened in 1992 and destroyed over 8,200 dwellings and killed an estimated 54 people.

Earlier this year, the earthquakes in Nepal reminded us of the devastating consequences earthquakes can have on countries that are unprepared for such catastrophic events. In order to prevent such consequences in Central Asia, it is imperative that current seismic preparedness of the countries be evaluated and gaps in risk management identified. This will allow for creation of a more systematic and effective investment framework for seismic risk reduction.

In order to share regional and international experiences on seismic risk management and improve knowledge and understanding of seismic risks on both national and regional scales, the World Bank held a Central Asia: Seismic Risk Session on May 12, 2014 in Almaty, Kazakhstan. During this session, representatives from Kazakhstan, Kyrgyz Republic, Tajikistan and Uzbekistan presented on each of the country's statuses on seismic risk and ongoing reduction and mitigation initiatives, and discussed the needs and challenges that they face. A discussion on international experience in seismic risk mitigation was also hosted.

The World Bank is committed to expanding its effort on seismic risk reduction and management in Central Asia. In order to continue the dialogue among countries' officials and international partners on investment strategies and risk financing, the World Bank organized a two day Central Asia Earthquake Risk Reduction Forum. The Forum was held in Almaty, Kazakhstan on October 27-28, 2015.

The Forum was made possible with the financial

support of the Japan-World Bank Program for Mainstreaming Disaster Risk Management in Developing Countries and other partners.
The objectives of the Central Asia Earthquake Risk Reduction Forum were to understand the current state of seismic risks of the region and their potential fiscal impacts, and to advance the dialogue on seismic risk reduction initiatives among policy makers and practitioners in the Central Asia region. The Forum served as a platform for cross-sectoral knowledge and experience sharing among stakeholders on investment solutions that w seismic resilience at a national and regional levels.

The two day event was comprised of presentations and discussions on preparedness and response capacities of each country, international experience on risk assessment and the state of risk assessment in Central Asia, best practices in risk reduction investment and seismic risk reduction activities in Central Asia, urban resilience of cities, and rwisk financing. The topics of the sessions were chosen in line with the priorities outlined in the Sendai Framework for Disaster Risk Reduction 2015-2030.

The participants of the Forum includes decision makers from key line ministries of the Central Asian countries involved in seismic risk reduction, officials of departments managing fiscal risks in the Ministry of Finance, representatives from the Ministry of Emergency Situations, practitioners from the scientific community in the Central Asian countries, key actors from outside the region, such as representatives Japan, who showcased international experience and good practices in seismic risk reduction and financial protection, media, and the donor community involved in disaster risk management in the region.

The Forum was intended lay the groundwork for building an investment framework for seismic risk reduction and management programs for the Central Asian countries. The outcomes of the Forum and the investment framework will serve as a basis for follow-up projects and initiatives.

This Forum Proceedings document summarizes the session presentations and discussions which were held during and after each of the sessions.

FORUM SESSIONS AGENDA

DAY 1: OCTOBER 27TH, 2015

9:00 – 10:30	**OPENING CEREMONIES:** Welcoming words from Mr. Saroj Kumar Jha, Regional Director for Central Asia, World Bank Video message from the Governor of Hyogo Prefecture: Mr. Toshizo Ido Keynote speech on Turkey's earthquake history and recovery experience: Mr. K. Gokhan Elgin, Project Director, Istanbul Project Coordination Unit (IPCU), Istanbul Governorship, Turkey **Master of Ceremony:** Mr. Vigen Sargsyan, Senior Communications Officer, World Bank
11:00 – 12:30	**PRESENTATION SESSION 1: ARE WE PREPARED FOR THE NEXT ONE?** **Presented by:** Central Asian agencies in charge of emergency situations **Topic:** presentations focused on the preparedness and response capacities of each of the Central Asian countries **Setting the stage:** Mr. Carlos Afonso, Regional Director, EU Humanitarian Aid and Civil Protection department (ECHO) **Presenters:** Mr. Zhasulan Dzhumashev, Deputy Chairman, Committee of Emergency Situations, Ministry of Internal Affairs, Republic of Kazakhstan Mr. Talaibek Temiraliev, State secretary of the Ministry of Emergency Situations, Kyrgyz Republic Mr. Idibek Buriev, Head of Population and Territories Protection Department under the Head Office of Population and Territories Protection of the Committee of Emergency Situations and Civil Defence, Republic of Tajikistan Mr. Fahriddin Gulomov, Head of Department on Civil & Territories Defence, Ministry of Emergency Situations, Republic of Uzbekistan **Moderator:** Ms. Elzat Mamutalieva, Community-Based Disaster Risk Management (CBDRM) Delegate, Swiss Red Cross, Kyrgyz Republic
14:00 – 15:30	**PRESENTATION SESSION 2: UNDERSTANDING RISK WITH A PURPOSE** **Presented by:** development agencies, private firms and research platforms **Topic:** international experience on risk assessment **Presenters:** Mr. Michael Haas, GFZ German Research Centre for Geoscience, Germany Mr. Yannis Fourniadis, Senior Engineering Geologist, Arup, UK Mr. Tatsuo Narafu, JICA Senior Advisor on Building Disaster Prevention, JICA, Japan **Moderator:** Ms. Maryia Markhvida, Seismic Risk Assessment Expert, World Bank
16:00 – 17:30	**PRESENTATION SESSION 3: WHAT DO WE KNOW ABOUT OUR SEISMIC RISK?** **Presented by:** Central Asia institutions responsible for seismic hazard and risk assessment **Topic:** presentations on the state of risk assessment in each of the Central Asian countries **Presenters:** Mr. Tanatkan Abakanov, Director of Institute of Seismology of the Republic of Kazakhstan, Academician KazNAU, UNESCO expert on the issue of earthquakes Mr. Kanatbek Abdrakhmatov, Director of the Institute of Seismology of the Kyrgyz Republic Mr. Anatoly Ischuk, Head of Seismic Hazard Assessment and Geoecology Department of the Institute of Earthquake Engineering and Seismology of the Academy of Sciences, Republic of Tajikistan Ms. Guljemal Saryeva, Director of the Institute of Seismology and Atmosphere Physics of the Academy of Science of Turkmenistan Mr. Sabriddin Husameddinov, Director, Institute of Seismology under Academy of Sciences Republic of Uzbekistan **Moderator:** Mr. Bolot Moldobekov, Co-Director, Central Asian Institute for Applied Geosciences (CAIAG)

DAY 2: OCTOBER 28TH, 2015

9:00 – 10:30	**PRESENTATION SESSION 1: INVESTING IN SAFER INFRASTRUCTURE** **Presented by:** risk reduction programs in various countries **Topic:** international experience on investments and best practices in risk reduction activities **Presenters:** Ms. Swarna Kazi, Disaster Risk Management Specialist at the World Bank, Bangladesh Urban Resilience Project, Bangladesh Mr. Kazuhisa Fujii, Director for Overseas Project, Overseas Project Division, Policy Bureau, Ministry of Land, Infrastructure, Transport and Tourism, Japan Mr. K. Gokhan Elgin, Project Director, Istanbul Project Coordination Unit (IPCU), Istanbul Governorship, Turkey **Moderator:** Ms. Kristine Tovmasyan, Programme Specialist for Natural Sciences, UNESCO cluster (sub-regional) office for Central Asia
11:00 – 12:30	**PRESENTATION SESSION 2: WHAT ARE WE DOING TO REDUCE THE EXISTING RISK?** **Presented by:** Central Asian line Ministries and State Committees **Topic:** presentations on the countries' past and present risk reduction initiatives **Presenters:** Ms. Toktokan Ashimbaeva, Deputy Minister of Education, Kyrgyz Republic Ms. Zulfiya Azizova, Chief Specialist of Emergency Situations and Emergency Medical Assistance Department, Ministry of Health and Social Protection, Republic of Tajikistan Mr. Dovran Bezirgenov, Chief Specialist of the Monitoring Unit of the Scientific-Research Institute of Seismic Resistant Construction of the Ministry of Construction and Architecture of Turkmenistan Mr. Shamil Khakimov, Head, Unit of Seismic Resistance Construction of ToshuyjoyLITI, State Committee for Architecture and Construction, Republic of Uzbekistan **Moderator:** Mr. Abdurahim Muhidov, Program Officer, Central Asia & South Caucasus, United Nations Office for Disaster Risk Reduction (UNISDR)
14:00 – 15:30	**H.E. MASAYOSHI KAMOHARA'S FORUM ADDRESS** Ambassador Extraordinary and Plenipotentiary of Japan to Kazakhstan
	PRESENTATION SESSION 3: OVERCOMING CHALLENGES IN URBAN RESILIENCE **Presented by:** Ms. Madhavi Malalgoda Ariyabandu, Sub-Regional Coordinator, UNISDR **Topic:** discussion on earthquake resilience of large Central Asian cities **Round Table:** Mr. Bakytbek Dyuishembiev, Vice-Mayor of Bishkek, Kyrgyz Republic Mr. Pulat Yasunov, Deputy of the Dushanbe City Parliamentarian Council; Deputy Head of Institute of Geology, Earthquake Engineering, and Seismology under the Academy of Sciences of Republic of Tajikistan Mr. Bakhtier Rakhmanov, First Deputy Khokim of Tashkent city, Republic of Uzbekistan
16:00 – 17:00	**PRESENTATION SESSION 4: REDUCING FISCAL VULNERABILITY** **Presented by:** Mr. Hector Ibarra Pando, Lead Financial Officer, World Bank **Topic:** international best practice presentation from the World Bank on risk finance strategies **Round Table:** discussion on reducing fiscal vulnerability to earthquake risk Mr. Ulukbek Karmyshakov, Deputy Minister of Ministry of Finance of the Kyrgyz Republic Ms. Mehrinamo Jonmamadova, Deputy Minister of Finance, Ministry of Finance of the Republic of Tajikistan Ms. Marina Shapovalova, Managing Director, JSC "Guarantee Insurance Payments Fund", Republic of Kazakhstan
17:00 – 17:30	**CLOSING REMARKS** **Presented by**: Jose C. Joaquin Toro Landivar, Regional Disaster Risk Management Coordinator for Europe and Central Asia at the World Bank

OPENING CEREMONY

Introductory statements at the inauguration of the event were made by Mr. Saroj Kumar Jha, Regional Director for Central Asia, World Bank; Mr. Toshizo Ido, Governor of Hyogo Prefecture, Japan; and Mr. K. Gokhan Elgin, Project Director, Istanbul Project Coordination Unit, Istanbul Governorship, Turkey.

MR. SAROJ KUMAR JHA

"One of the purposes of the Forum is to exchange experience not only between the Central Asian countries, but also countries who have previously engaged in large seismic risk reduction projects. This event can become an opportunity to learn from other countries' 'mistakes', in order to avoid them in Central Asia and minimize losses."

"Disaster risk reduction is not a matter of humanitarian aid, but development support. Over the years the region has come a long way in its development and was able to cut down poverty by 60%; however, this development is at risk and can be hindered, if not annulled, by a large earthquake."

"In addition to being an exchange of ideas and discussion, the Forum should lead to subsequent creation of concrete goals and focused engagement with the World Bank and other development partners in seismic risk reduction and resilience."

MR. TOSHIZO IDO

"A rapid response system, with robust functionality will enable efficient emergency response and rapid damage assessment."

"Collaboration between emergency management organizations with a pre-defined system for cooperation between institutions and across administrative units will facilitate better response."

"When local communities and neighbors are informed and prepared, resilient communities are created."

"Cities should be made more resilient, by rebuilding cities with more flexibility and considerations for public safety."

"It is important to provide support for vulnerable people, such as the elderly population."

MR. K. GOKHAN ELGIN

"1999 Marmara earthquake caused a paradigm shift in Turkey's seismic risk management, which went from a 'wait and see' to 'anticipate and prevent' approach. "

"Turkey has made tremendous efforts and large investments into transforming the face of Istanbul's seismic resilience."

"You don't need to wait for a catastrophe to happen in order to invest in disaster risk reduction in your country."

Online Poll

An online poll of all the participants was conducted to see what would be the one thing that they would like to see as an outcome of the Forum. Some of the responses and desired outcomes included a regional collaborative project on disaster risk reduction (DRR), action plan and grant support based on the outcomes of the Forum, a regional platform that would show the past and ongoing DRR programs in the region, and the replication of Istanbul experience in Central Asia.

H.E. MASAYOSHI KAMOHARA'S FORUM ADDRESS

H.E. MASAYOSHI KAMOHARA, AMBASSADOR EXTRAORDINARY AND PLENIPOTENTIARY OF JAPAN TO KAZAKHSTAN

I appreciate very much the opportunity you gave me to address you at today's important forum organized by the World Bank.

Learning from years of experience confronting natural disasters, Government of Japan has been closely collaborating with the World Bank in mainstreaming "disaster risk management", DRM, in development policies and practices. The collaboration was further strengthened, particularly after the Great East Japan Earthquake happened in 2011.

In 2014, Japan and the World Bank jointly announced a program called "Japan – World Bank Program on Mainstreaming Disaster Risk Management in Developing Countries". DRM Hub Tokyo was established in the World Bank Tokyo office, as operational arm of the program.

Government of Japan is delighted to support this important event through the "Japan – World Bank Program", inviting Central Asian countries with significant seismic risks.

The beautiful panorama of the Tian Shan Mountains seen from Almaty City is one of the charming points of the city, but the beauty is accompanied by seismic risks. As is known, Almaty is situated on the Pamir – Tian Shan earthquake zone. In addition, the city still has many old houses and buildings that were constructed in the Soviet period. So, earthquake is very serious problems for Kazakhstan, and it is important for its government and private sectors to take effective measures as soon as possible.

On the other hand, earthquake-resistant technology makes progress day by day. Particularly, Japan has the most advanced seismic technologies, since earthquakes are frequent in Japan. We have collaborated

with Kazakhstan by the medium of JICA in the field of countermeasures against earthquake disasters, including consultation on the Regional Center for Disaster Response and Risk Reduction. As Kyrgyzstan approved the agreement to set up the Center in July of this year, a relevant seminar inviting experts was organized in August in Almaty. JICA plans to conduct training for foreign experts in the next three years. We expect that the staff of the Center will participate in the training in the framework.

Japan Geo-Research Institute Foundation, Kazakh Scientific-Research Institute of Construction and Architecture under the Ministry of National Economics, and Eurasian National University signed in this month a memorandum on academic cooperation that includes studying and monitoring seismic ground motion in Almaty. We expect that this recent agreement will allow our cooperation to take more concrete shape.

Thank you for your attention.

ARE WE PREPARED FOR THE 'NEXT ONE'?

SESSION OBJECTIVES: to demonstrate what emergency management agencies in Central Asia are doing to prepare for the next earthquake event

Setting the Stage:

Mr. Carlos Afonso, Regional Director, EU Humanitarian Aid and Civil Protection Department (ECHO)

Presentations by:

Mr. Zhasulan Dzhumashev, Deputy Chairman, Committee of Emergency Situations, Ministry of Internal Affairs, Republic of Kazakhstan

Mr. Talaibek Temiraliev, State Secretary of the Ministry of Emergency Situations, Kyrgyz Republic

Mr. Idibek Buriev, Head of Population and Territories Protection Department of the Committee of Emergency Situations and Civil Defence, Republic of Tajikistan

Mr. Fahriddin Gulomov, Head of Department on Civil and Territories Defence, Ministry of Emergency Situations, Republic of Uzbekistan

Session Moderator:

Ms. Elzat Mamutalieva, Community-Based Disaster Risk Management Delegate, Swiss Red Cross

ECHO DISASTER RISK REDUCTION ACTIVITIES IN CENTRAL ASIA

ECHO's central mandate is to save and preserve lives during emergencies and their immediate aftermath, for either man-made crises or natural disasters; to carry out short term rehabilitation and reconstruction work, to help those affected regain a minimum level of self-sufficiency, taking long term development objectives into account where possible; and to ensure preparedness for risks of natural disasters and use of suitable rapid early-warning and intervention systems. DRR and resilience, which are integrated into ECHO's work, are integral aspects because they save human lives and prevent future losses: investment in DRR reduces both short and longer-term impacts of disasters, where $1 spent for preparedness will save $5 -$7 for relief.

In Central Asia, ECHO's involvement dates back 22 years ago. ECHO's disaster preparedness programme, DIPECHO, has been implemented since 2003 in the region. DIPECHO projects focus on the most vulnerable groups in high-risk areas; short-term, community-based and people-centered preparedness with strong local ownership; creating awareness, providing trainings and building local capacities; and support for national and regional coordination. A good example of an earthquake related DIPECHO project in Central Asia is the DIPECHO VII project "Strengthening Earthquake Risk Mitigation Capacities in Uzbekistan", which was implemented by UNDP. The project contributed to the establishment of the Earthquake Simulation Complex in Tashkent, Uzbekistan.

REPUBLIC OF KAZAKHSTAN

The Republic of Kazakhstan is taking many steps to prepare for the next earthquake event. During the period of 2010-2015, seismic retrofits were done for 101 educational, 50 health and 100 industrial facilities. In some oblasts, new schools are being constructed to replace schools which are dangerous to use and that require seismic retrofit, for example in the South Kazakhstan oblast in 2014-2015 there were 17 new schools built.

The Republic of Kazakhstan also has an early warning system in place for receipt and distribution of information on national, provincial, district and facility levels. Numerous earthquake trainings of population and organizations are held regularly, with over 17,000 trainings held annually. In case of a large earthquake event, the majority of rescue services will be deployed on Day 1 and all forces will mobilized by Day 8.

The Committee of Emergency Situations holds reg-

ular intensive training sessions for search and rescue services. In addition, on an annual basis 1-2 officers from the Committee of Emergency Situations attend a 40-day course in Japan on the topic of "Disaster Risk Management on the Basis of Local Communities", which is funded by the Japanese International Cooperation Agency (JICA).

KYRGYZ REPUBLIC

Earthquakes are extremely destructive due to their nature, as they occur suddenly, and often accompanied with secondary effects (landslides, avalanches, fires, etc.). Kyrgyz Republic occupies a large part of the Tien-Shan and northern areas of the Pamir, and is one of the earthquake-prone regions of Central Asia. Two main seismically active zones – North Tien-Shan and South Tien-Shan –are located exactly at the north and south border areas of the Republic.

Following a 2011 agreement between the Ministry of Emergency Situations and the Institute of Seismology under the National Academy of Sciences of the Kyrgyz Republic, a new seismic zoning map of the territory of the Kyrgyz Republic (scale 1:1000 000) was created, which reflects a degree of contemporary seismic risk in the country. According to this map, almost the entire territory of Kyrgyzstan may be exposed to strong earthquakes of 8- 9 point intensity.

To support the Kyrgyz Republic Government initiatives, UN Children's Fund (UNICEF) provided technical assistance on execution of safety assessment for all preschool educational institutions and schools of the country. In total, 806 preschool educational institutions and 2,222 schools have been visited by research groups, including assessment of 1,198 and 5,583 buildings of preschool educational organizations and schools across the country, respectively. The results of the preliminary assessment show that up to 89% of all preschool buildings and 81% of schools are structurally unsafe and did not meet the legal requirements for a number of safety criteria. Similar studies are planned to be conducted for medical institutions.

The State System of Civil Protection is a national system that is comprised of governing bodies, forces of state bodies, bodies of local self-governance, NGOs and voluntary organizations of the Kyrgyz Republic, which performs a function on protection of population

and territory of the Kyrgyz Republic in emergency situations in peace and war times. The Ministry of Emergency Situations, which is part of the State System of Civil Protection, is responsible for forecasting, monitoring, prevention, liquidation and management of emergency situations; training of specialists and rescue teams; and the state fire-fighting service. Two national Centers for Crisis Management are located in Bishkek and Osh. After 2011, the Unified Information-Management System (UIMS) for emergency and crisis situations was created to increase the efficiency of Centers for Crisis Management, introduce the National Unified System for Population Informing and Warning, and implement the unified state duty-dispatching service, 112. The 112 service was introduced in Bishkek city, Osh city, Karakol town, Jalal-Abad town, Talas town, and all districts and towns in Batken, and Osh oblasts, with plans to expand to other regions. The main achievement of the UIMS was the reduction of average time needed for integrated response of urgent operative services to emergency and crisis situations by 20%.

REPUBLIC OF TAJIKISTAN

Most common and devastating hazards in Tajikistan are earthquakes, floods, mudflow events, landslides, avalanches, and rock falls. In the period from 2010 to 2015, 145 earthquakes have been registered, causing US$ 4.7 million in damage. The facilities that are at risk to earthquakes include cities/towns and mountainous settlements; hydro power plants and factories, especially with hazardous productions; major natural sites such as Lake Sarez in the Pamirs, and landslide-prone mountain slopes such as Baipaza, Iston; and industrial hazardous deposits.

The Committee of Emergency Situations and Civil De-

fence under the Government of the Republic of Tajikistan is a central executive body exercising the following functions: adopting government policies; ensuring legal and normative regulation; providing state services and ensuring state property management in the field of emergency management and civil defence; guiding government policy in the field of preparing and protecting the population, economic entities and territory of Tajikistan against consequences of the peace- and war-time emergencies; organizing the coordination of the entire set of the nation-wide legal, defence and other activities. Multiple rescue teams exist throughout the country's territory, which are provided with specialized vehicles, equipment, outfits, tools and materials intended to conduct search-and-rescue and emergency response in zones of emergency.

Under the National Platform for Disaster Risk Reduction, the goals in the Republic of Tajikistan are to develop major earthquake preparedness and response plans; develop the Emergency Recovery Guidelines for major disasters, including earthquakes; establish Regional Crisis Management Centers and strengthen the Management Centre of the Committee of Emergency Situations; and raise awareness of different levels of population through the Training and Methodological Centre of the Committee of Emergency Situations.

REPUBLIC OF UZBEKISTAN

Protection of population and territories from emergency situations is an integral part of the national security On the territory of Uzbekistan the most hazardous natural processes are geological (earthquakes, landslides, rock falls) and hydrometeorological (floods, mudflows, avalanches).

Ministry of Emergency Situations was established in 1996 and its main objectives are the development and implementation of the state policy in the field of emergency situations prevention and protection of lives and health of population, material and cultural values. It also coordinates disaster management activities of the ministries, agencies, Council of Ministers of the Republic of Karakalpakstan, Khokimiyats of provinces, cities and districts. The Ministry is also responsible for organization of preparedness training of the population and officials.

The State System of Prevention and Response in Emergency Situations is comprised of many ministries and agencies, and is operational on both national and local levels. Risk management is done through monitoring, identification of threats, and risk reduction by the implementation of preventative measures, training of the population, and preparation and accumulation of necessary resources. In 2011, the Government adopted a resolution "on approval of the comprehensive program on training of population on response actions during emergency situations (of natural and man-made character) caused by earthquakes". One of the achievements in this area was the creation of the Earthquake Simulation Complex at the Institute of Civil Defense in Tashkent, which opened in 2015 and is intended to increase awareness about the consequences of earthquakes.

Conclusions

(1) In the wake of the recent Nepal earthquake, all emergency management agencies agree that drills and preparedness are critical when it comes to disasters. In addition, channels for international support and humanitarian assistance should be prepared and ready in case of a large event.

(2) Risk information is currently used to create risk profiles for the areas in order to prepare the adequate measures for population protection; however, up-to-date risk information is needed to reflect the current risk and be prepared for more representative disaster scenarios.

(3) Regional earthquake management activities should be strengthened in order to make better use of the newly created Regional Center for Disaster Response and Risk Reduction to achieve more efficient response and preparedness.

(4) Central Asian countries have improved their capacities for preparedness and response in the recent years. However, the risk of a large earthquake event in the region is high, and therefore continued improvement in the capacity of the countries is imperative.

UNDERSTANDING RISK WITH A PURPOSE

SESSION OBJECTIVES: to demonstrate state-of-the-art work and projects conducted by the leading international institutions in the field of earthquake risk assessment around the world

Presentations by:

Mr. Michael Haas, GFZ German Research Centre for Geoscience, Germany
Mr. Yannis Fourniadis, Senior Engineering Geologist, Arup, United Kingdom
Mr. Tatsuo Narafu, JICA Senior Advisor on Building Disaster Prevention, JICA, Japan

Session Moderator:

Ms. Maryia Markhvida, Seismic Risk Assessment Expert, World Bank

A NOTE ON SEISMIC RISK

Seismic risk can be assessed and quantified by combining three essntial components: hazard, exposure and vulnerability. In other words, the intensity of earthquake that can be expected; the assets, infrastructure, or population that is in the hazard's way; and the affect that the earthquake will have on the exposed assets, infrastructure or population. When one combines all of these three components the seismic risk, or the potential economic, social and infrastructure losses, can be quantified.

When countries are faced with limited financial resources they must make intelligent and effective decisions when it comes to investments in seismic risk reduction. Risk assessment is a key element to making such decision, where its purpose can be to identify and understand what regions of the country are most vulnerable and which should be prioritized for action. The results of a risk assessment can help governments and local agencies plan and prioritize investment into risk reduction, improve their preparedness and inform the proper land use and urban planning. The results can also be used in fiscal planning and catastrophe insurance pricing. On the other hand, risk assessment is the key step to proper structural retrofitting and hazard assessment lays at the core of seismic building codes.

MR. MICHAEL HAAS

The GFZ German Research Centre for Geosciences (GFZ), specifically the Centre for Early Warning Systems is involved in a variety of risk assessment projects with a focus in Central Asia, the Indian Ocean, the Eastern Mediterranean and Mid-Europe regions. The projects and assessments consider vulnerability of exposed assets through advanced methodologies, real-time single- and multi-type risk scenarios, ad-hoc instrumentation concepts to support the centre's tasks, and advanced tools for guiding decision making and post disaster actions.

The center collaborates with main research institutions throughout Central Asia and implements a variety of projects including EMCA (I & II), SENSUS, risk assessment in the Kyrgyz Republic, and hazard assessment in the Republic of Kazakhstan.

The Earthquake Model Central Asia (EMCA) is regional program coordinated by the GFZ; EMCA aims at the cross-border assessment of seismic hazard and risk in Central Asia. There are 3 components: (1) seismic hazard assessment and micro-zonation; (2) seismic vulnerability; (3) earthquake risk. The first phase of the project involves determination of site effects, where in situ assessment has been done in Bishkek, Tashkent, Dushanbe, Almaty, Maryn and Khorog. The seismic hazard was assessed both with and without the inclusion of site effects. A multi-scale exposure estimation was performed by coupling remote sensing with in-situ or remote rapid visual survey to achieve the most comprehensive results. Several vulnerabilities were chosen and unified across all countries for the

classification of buildings. Landslide susceptibility and risk were also assessed.

GFZ is also engaged in capacity building in Central Asia, in collaboration with local agencies and other international partners.

MR. YANNIS FOURNIADIS

Arup projects in the area of risk assessment and reduction are being undertaken in accordance with the Sendai Framework Principles – with the aim to reduce disaster risk, loss of life and economic impacts. Some on Arup's past projects in this field include maximum probable loss estimation of road infrastructure in USA, structural strengthening of schools in Turkey, and evaluation of earthquake risk to buildings in Hong Kong. Arup is also working on a World Bank seismic risk assessment program in the Kyrgyz Republic in collaboration with Central Asian Institute for Applied Geosciences (CAIAG), Global Earthquake Model (GEM), and GFZ. This two-year project (2015-2016) is comprised of the following steps: undertaking a seismic hazard assessment, which identifies where earthquakes are expected to occur and how strong the ground shaking is; developing a database of buildings and infrastructure across the entire country; undertaking seismic risk calculations to estimate the amount of damage to buildings and infrastructure and potential casualties that could occur as a result of an earthquake; developing seismic risk management strategies that allow cost-effective risk reduction and prioritization; and communication of the methodology and outcomes of the project to end-users in the Government and other sectors of society in the Kyrgyz Republic. The seismic hazard and risk calculations were done using open-source tools, in order to ensure transparency. The seismic risk reduction strategy that will be developed as a result of this project will consider structural, non-structural and financial measures.

In addition to the aforementioned projects, Arup has developed the Global Programme for Safer Schools for GFDRR, which includes the definition of the characteristics of a safe school, assessment of the safety of existing schools, and identification of measures to be taken during design, construction and operation of schools. The presentation was concluded with some recommendations to facilitate and ensure quality of seismic risk assessment: ensure up-to-date seismological and geophysical data are available, develop exposure and vulnerability models to the appropriate resolution, undertake seismic hazard and risk calculations in a transparent manner, involve Government and civil society in the development of the seismic risk management strategy, communicate hazard and risk results to local (Government, vulnerable population groups) and global (World Bank, donors) stakeholders.

MR. TATSUO NARAFU

JICA has a large range of experiences in earthquake disaster management projects, some of which include development of comprehensive earthquake disaster management programs; establishment of research and development centers; support for reconstruction from disasters; capacity development; development and dissemination of seismic technologies; group training programs on seismology and earthquake engineering, and disaster management in buildings and residential areas; and Science and Technology Research Partnership for Sustainable Development focusing on disaster management. Approach and methodology of risk assessment and comprehensive earthquake disaster management programs that are developed by JICA, follow the approach applied by local governments in Japan.

In the past, comprehensive earthquake disaster management programs were developed based on scientif-

ic-based risk assessments in Algeria, Armenia, Colombia, Iran, Kazakhstan, Nepal, Philippines, Turkey and Venezuela. The program in the Republic of Kazakhstan conducted a seismic risk assessment of Almaty, where three earthquake scenarios were considered and an inventory of 9,000 buildings was taken. Casualty levels and damages to infrastructure were also estimated. The 1887 Verny M7.3 earthquake scenario, which had the highest damages, yielded an estimated 25,000 building damages, 25,000 deaths and 31,000 injuries.

One of the challenges that developing countries face in risk assessments is insufficient seismological, geophysical and soil profile data, as well as data on existing buildings and houses, information on vulnerability of buildings, and information on relation between damage of buildings and casualties. Another challenge in developing countries is the insufficient capacity for implementation and continuation of the disaster management programs, which can be addressed by stakeholder involvement and special capacity building programs.

Conclusions

(1) Before conducting any seismic risk assessment, we need to understand what its purpose is. What will be the difference between our assessment and the previous ones? How do we effectively use the results of the risk assessment? Risk assessments are the most valuable when we use them in decision making.

(2) Earthquake risk assessment must encompass all three aspects: hazard, exposure, and vulnerability.

(3) Risk assessments should consider existing local and regional knowledge and experience in the field. The importance of collaboration with local agencies should be noted, as they will be the user of the final product.

WHAT DO WE KNOW ABOUT OUR SEISMIC RISK?

SESSION OBJECTIVES: to understand what research and investigative work has been done in Central Asia with respect to earthquakes and where Central Asian countries stand in terms of seismic risk assessment

Presentations by:

Mr. Tanatkan Abakanov, Director of Institute of Seismology of the Republic of Kazakhstan
Mr. Kanatbek Abdrakhmatov, Director of the Institute of Seismology of the Kyrgyz Republic
Mr. Anatoly Ischuk, Head of Seismic Hazard Assessment and Geo-ecology Department of the Institute of Geology, Earthquake Engineering and Seismology of the Academy of Sciences of the Republic of Tajikistan
Ms. Guljemal Saryeva, Director of the Institute of Seismology and Atmosphere Physics of the Academy of Science of Turkmenistan
Mr. Sabriddin Husameddinov, Director of Institute of Seismology under Academy of Sciences, Republic of Uzbekistan

Session Moderator:

Mr. Bolot Moldobekov, Co-Director, Central Asian Institute for Applied Geosciences (CAIAG)

REPUBLIC OF KAZAKHSTAN: INSTITUTE OF SEISMOLOGY

In the past year, Kazakhstan had about 10 strong earthquakes. Kazakhstan typically does not seek external help but handles the consequences on their own. In order to monitor the seismicity, seismic stations are set up throughout the country; however, the stations are not distributed equally, where some parts of the country are better covered then others. In 2015, the earthquake zoning was done according to EU standards and mapping is planned on a district level for Almaty city in response to the instruction of the President.

The Institute of Seismology is involved in various research areas including studying the internal structure of the Earth and the physics of earthquakes, and monitoring and forecasting of earthquakes for long- and medium-term. The Institute performs spatial seismic hazard and risk assessments and analyzes seismic behavior of residential and industrial infrastructure, as well as of strategic assets in areas of strong and destructive earthquakes. The Institute also studies anthropogenic and induced earthquakes and assesses the operational reliability and seismic resilience of special-purpose structures. In addition, seismic assessment of various economic strategic facilities is carried out, such as the Kapchagai hydro power plant. Comprehensive seismic monitoring systems are put in places to monitor hydrocarbon development fields.

Kazakh seismologists collaborate with major international partners and research organizations, such as UNESCO, Germany, Japan, China, Russia and others. There is also a regular exchange of methodology and technology, where Kazakh seismologists get trained in foreign centers. Since 2014, the Institute started a program of highest education in seismology in cooperation with Satpayev Kazakh National Technical University.

KYRGYZ REPUBLIC: INSTITUTE OF SEISMOLOGY

Institute of Seismology of Kyrgyz Republic has a network of seismic stations throughout the country that allows to monitor earthquake activity. It has undertaken works to catalogue the active faults, with identification of slip rates and recurrence intervals. Micro-zoning maps have been created for Bishkek, Osh, Tokmok, Karakol, Naryn, and Jalal-Abad using traditional techniques, which require an update using modern hazard assessment methodology. The Institute of Seismology of the Kyrgyz Republic in engaged in collaborative

work with many other countries, including China, Germany, Kazakhstan, Norway, Russia, Tajikistan, UK, USA, and Uzbekistan.

There are several challenges that exist when it comes to hazard and risk assessment in the Kyrgyz Republic. First of all, several versions of probabilistic seismic hazard maps and seismic risk of the Kyrgyz Republic and Central Asia territory have been created. However, the results are very different, so it possess a problem when choosing which map to use for decision making, planning and further work. In some cases, local experts are not receiving the data collected from joint research with foreign colleagues, which is important for improvement, supplement and development of existing maps. The geological basis of these maps are not always consistent, with some well studied and some not well studied areas. There is also a lack of capacity and specialists in probabilistic approaches to seismic risk assessment, which makes it difficult to integrate the framework into local practice. The building codes should also be revised and improved. Finally, there is a lack of willingness to take responsibility for the introduction of new hazard maps and risk assessments that use different methodology from before.

REPUBLIC OF TAJIKISTAN: INSTITUTE OF GEOLOGY, EARTHQUAKE ENGINEERING AND SEISMOLOGY

The Institute of Geology, Earthquake Engineering and Seismology of the Academy of Sciences of the Republic of Tajikistan (IGEES) is a research institute that was established in 2011, when two institutions – Institute of Geology and Institute of Earthquake Engineering and Seismology – were joined into one. It has a big history of studies in seismicity, seismic hazard and risk not only in Tajikistan, but in the whole Central Asia region.

Current seismic hazard map of Tajikistan that is still in use was developed during the USSR; however, the Institute recently developed new maps in terms of both MSK-64 intensity and peak ground acceleration. As part of the DIPECHO-V program, vulnerability of various buildings in Dushanbe was assessed. In collaboration with international partners the loss evaluation and vulnerability assessment was done for the city of Khudjand.

The past experience of strong earthquakes in the area of Tajikistan indicates that more victims and property loss is connected with slope instabilities like landslides. The specificity of the Tajikistan is that landslides in loess deposits, which are widespread in Central Asia, transform to earth-flow or even mudflow, which can travel long distances. Therefore, correct seismic risk estimation in mountain areas should take into account earthquake induced slope failuresv. Map of earthquake induced landslides was developed for the territory of Tajikistan.

In order to improve seismic risk assessment in Tajikistan the following initiatives are needed: establishment of research for multi-hazards risk with estimation based on the up-to-date techniques; improvement of the capacity and technical skills of the Institute; use of local experience and knowledge during joint assessment activities; and establishment of deeper cooperation with other seismological institutions in Central Asia and around the World.

TURKMENISTAN: INSTITUTE OF SEISMOLOGY AND ATMOSPHERE PHYSICS

In Turkmenistan, the assessment of risks is a multi-sectoral issue and is addressed jointly with different state agencies. Currently, there are 21 seismic stations and 17 soil stations in Turkmenistan. Until 2014, the Institute of Seismology was equipped with analogue equipment; however, US$ 4 million was allocated by the Government to replace the analogue stations with digital ones. At the moment fiber optic connection is being put in place for data exchange with other countries and connection in remote areas will be functional via satellite communication. There is also a plan to sign a cooperation agreement with JICA for upgrading the technical facilities.

Various seismic hazard maps exist for the territory of Turkmenistan. Mapping is done on both domestic and trans-border areas. The current seismic map used in Turkmenistan was developed in 2001. There also exists a catalogue of the earthquake epicenters for the time period of 1955-2015.

Another task that the Institute undertakes is training of professionals in seismic risk assessment. Although various research in being conducted with respect to seismic risk assessment, it is still a relatively new topic for Turkmenistan that is being developed.

REPUBLIC OF UZBEKISTAN: INSTITUTE OF SEISMOLOGY

The problem of ensuring the seismic safety of population and territories is complex. Primarily, these issues include seismic hazard zoning, earthquake engineering, training activities to raise awareness of the population for response actions in emergency situations, creation of the optimum system for warning and notification, risk assessment and a number of other activities. The concept of protection of population and territories from seismic hazard in Uzbekistan covers all of these items and is based on sufficient legislative and regulatory framework.

The Institute of Seismology of Uzbekistan was established after the Tashkent earthquake in 1966. The main experimental base of seismological research is the system of seismological monitoring. The modern network of the seismological monitoring in Uzbekistan includes 45 seismic stations, 20 geophysical stations and 4 local stations for specific sites. Current seismic hazard maps were developed in 2011 for peak ground acceleration, spectral accelerations, and ground motion intensity for non-exceedance probabilities of 90%, 95% and 99% in 50 years.

In terms of the status of seismic risk assessment in Uzbekistan, scientific and technological foundations for the risk assessment have been developed, the base of expertise and data is being developed for assessment of risk on different territorial scales, and an innovation project is planned.

Conclusions

(1) It is important for us to convene and develop a plan of actions for unifying seismic zones, because these risks have no boundaries between countries. Today each country has their own hazard assessment and zoning methodology which poses a challenge when working at a trans-boundary level.

(2) The hazard maps need to be updated every 10 years. During this period the countries need to update their knowledge and skills. Each country has its own specifics and if any country decides to choose a different approach, then it would make the task more difficult. This is a challenge that needs to be addressed by the countries. Discussions were held with the directors and seismic specialists in hope to initiate a project that will produce a common map for the region.

(3) The current risk information used in Central Asia is primarily based on hazard assessment only. Therefore, capacity building in exposure and vulnerability information has been identified as a key area for development in order to ensure complete understanding of risk.

(4) It was identified that the base information at the foundation of many of the assessment was created during the Soviet period and should be updated.

INVESTING IN SAFER INFRASTRUCTURE

SESSION OBJECTIVES: to see how risk assessments have been used around the world and demonstrate successful example of large scale earthquake risk reduction investments, including their planning and implementation

Presentations by:

Ms. Swarna Kazi, Disaster Risk Management Specialist, World Bank, Bangladesh Urban Resilience Project
Mr. Kazuhisa Fujii, Director for Overseas Project, Policy Bureau, Ministry of Land, Infrastructure, Transport and Tourism, Japan
Mr. K. Gokhan Elgin, Project Director, Istanbul Project Coordination Unit, Istanbul Governorship, Turkey

Session Moderator:

Ms. Kristine Tovmasyan, Programme Specialist for Natural Sciences, UNESCO office for Central Asia

ADDRESSING URBAN DISASTER RISK: BANGLADESH

Bangladesh is one of the most disaster prone countries, which is highly exposed to a variety of hazards, such as floods, cyclones, tidal surges, and earthquakes. The Government of Bangladesh has proactively invested in DRM to protect lives, reduce losses and protect development gains. Dhaka is the capital of the country and one of the fastest growing megacities in the world, with a population of 15 million people. The city has extremely vulnerable infrastructure with frequent fires and collapse of buildings. On April 23, 2013, the commercial building Rana Plaza, which housed many clothing factories, collapsed killing 1,127 people. One of the reasons for this collapse was the unregulated building construction with inadequate design and poor construction quality. The rescue operation showed weaknesses in the city's emergency response system, with an unclear chain of command and lack of a modern communication system.

In order to prevent another disaster like this from happening, Bangladesh implemented a comprehensive urban resilience program in Dhaka and Syhlet. An initial technical assistance to the Government of Bangladesh, based on GFDRR grant support, was aimed to address seismic risk and the structural vulnerability of urban buildings and infrastructure, which convened government officials across ministries and agencies to: (i) reach consensus on the level of seismic risk in Dhaka and other parts of Bangladesh; and (ii) increase the understanding of legal and institutional arrangements and "on-the-ground" practices related to urban DRM. Based on the results of the technical assistance, the Bangladesh Urban Resilience Project was developed with an objective to strengthen the capacity of Government of Bangladesh agencies to respond to emergency

events and to strengthen systems to reduce the vulnerability of future building construction to disasters in Dhaka and Sylhet. This will be done by performing the following three components: (1) enhancing national-level and local-level DRM facilities and agencies in Dhaka and Sylhet to effectively plan and respond to urban disasters; (2) assessing the vulnerability of essential infrastructure, public facilities, and lifelines; and, (3) ensuring resilient construction by integrating disaster risk into development planning, and establishing the infrastructure to ensure an efficient process for land use and zoning clearance. The project will be implemented through collaborative work between the Government of Bangladesh, the World Bank and JICA.

JAPAN'S DISASTER MANAGEMENT FOR ROADS

Japan is one of the countries frequently hit by earthquakes, with 20% of the world occurrence of earthquakes over M6.0, such as the 2008 Iwate-Miyagi Nairiku earthquake, 2009 Shizuoka Earthquake, and 2011 Great East Japan Earthquake. The M9.0 Great East Japan Earthquake hit Japan on March 11, 2011, which originated in the Pacific Ocean and was the 4th largest earthquake in the last 100 years. Over 18,000 people have died or are missing, over 1.1 million houses have been at least partly destroyed, and 15 expressways and over 700 sections of general roads were damaged and subsequently closed. Most of the damage was caused by the subsequent tsunami.

In 1959, the Government of Japan established the "Basic Act on Disaster Control Measures". The Basic Act was established in order for the government to tackle disaster control in a more structured manner and to enhance comprehensive and systematic disaster prevention measures across the country. This Act requires the formulation of a "Basic disaster prevention plan", "Operational disaster prevention plan", and "Prefectural and municipal disaster prevention plans", which specify the responsibilities allocated to different administrative bodies. The implementation of disaster prevention measures is also required by this Act. The Basic Act outlines the pre-disaster actions, such as the establishment of an institutional framework, infrastructure-based countermeasures, implementation of emergency training, and stockpiling emergency supplies and materials. In addition, the Act specifies actions to be taken just after a disaster occurs as well as recovery works.

The road administration's experience after the 2011 Great East Japan Earthquake showed that a number of the Pacific coastal areas and roads were seriously damaged by the tsunami. The reopening of the roads involved removing debris and obstacles from the roads and securing a route for emergency vehicles. The vulnerability of bridges is another concern that is faced by transportation authorities. In January of 1995, the Great Hanshin and Awaji Earthquake hit Hyogo Prefecture, where a number of bridges collapsed due to fallen girders and broken piers. The Japanese Government learned an important lesson from this earthquake and started reinforcing aging bridges that were designed based on outdated standards.

Based on experience of the 2011 Great East Japan Earthquake and the tsunami, the Government of Japan started posting elevation signs along National Highways across the country so that road users and residents know the height of the locations where they are. In preparation for the anticipated "Tokyo Inland Earthquake", the government is considering a road reopening emergency plan for heavy congestion will be potentially created by abandoned passenger cars, accidents and other unexpected problems, which could prevent emergency vehicles from reaching their destinations.

Another important factor that facilitates relief and recovery works is the sharing of information among related organizations, especially during a large-scale disaster. During the 2011 Great East Japan Earthquake, GPS-equipped vehicles provided us with probe data that was then visually formatted into useful information for recovery. Big-data based analysis is becoming common among related organizations and is being used to decipher the situation in the affected areas. In 2014, a nation-wide electronic disaster prevention information system was established, involving real-time information collecting systems and apps based on big data.

ISTANBUL SEISMIC RISK MITIGATION AND EMERGENCY PREPAREDNESS PROJECT (ISMEP)

Turkey is a country where 70% of the population is living in earthquake prone areas. During the period of 1980-2014 human and economic losses due to earthquakes amounted to 21,193 lives and US$24.5 billion

of damages. The tragic account of the 1999 Marmara Earthquake took the lives of 18,000 people, completely destroying 113,000 housing units and causing US$10-15 billion of direct damage. The earthquake caused communication systems to fail, where the lack of organization and coordination hindered search and rescue activities. There was also a serious funding gap following the disaster. This event changed Turkey's approach to DRM where they adopted ex-ante approach by investing in preventative and risk reduction measures.

Istanbul was chosen as the city for large scale risk reduction works, since it is a home to 20% of Turkey's population generating more than 40% of Turkish gross national product (GNP) and is also a historic and cultural center. During the design of the project three major concerns were addressed: (1) economic consideration of the costs and reduction in the expected losses; (2) technical competence to ensure that structural updates and retrofits are up to the highest seismic standards and the building code enforcement is in place; and (3) the conducted works are socially acceptable taking into consideration the importance of cultural and historical heritage, and facilities in critical sectors such as education and health. The ISMEP project was planned in four phases:

Phase I: ISMEP Project Preparations (2000-2005) – ownership, prioritization, budget allocation, comprehensive approach, and risk reduction strategy

Phase II: Project Organization (2006)– local administration, establishment of Istanbul Project Coordination Unit, development of project team, steering committee

Phase III: Implementation (2006+) – socially acceptable and human oriented, technical feasibility and harmony with international standards, appropriate financial and economic solutions, working with multi-stakeholders

Phase IV: Experience and Knowledge Sharing – establishment of a centre of excellence in Istanbul

Phase III, or the implementation of the project, involved strengthening of emergency management capacity, seismic risk mitigation for priority public buildings, and enforcement of building codes. Feasibility study was done for 1,969 public facilities and 383 more are currently being studied. Retrofitting and reconstruction works have or will be done in 944 schools. In the health sector seismic retrofitting and reconstruction works are being done on 17 hospitals and 61 polyclinics, where modern technologies such as base isolation are used. As part of the program public awareness and training programs for disaster preparedness are also conducted. Another project that is part of the implementation phase of ISMEP is the "inventorization and multi-hazard and earthquake performance of the cultural heritage buildings in Istanbul". The objective of this project is to mitigate the seismic risk associated with the cultural and historical property in Istanbul. Another aspect that is considered in ISMEP, is the improvement of building code enforcement, part of which will be done through the electronic document system and digital archive system for building permits.

Conclusions

(1) The successful risk reduction programs in Bangladesh, Japan and Turkey demonstrated that in order to have an effective risk reduction program, a clear understanding of risk is needed. The risk information allows prioritization of risk reduction activities in light of constrained financing and it helps to convince high level decision-makers of investments.

(2) A well designed program based on clear prioritization criteria has shown that international financial institutions are more willing to invest in the risk reduction program. Such programs provide a clear direction for steps to be taken in the implementation of the measures.

(3) The governments of Bangladesh, Japan and Turkey learned the significance of investing in large risk reduction programs only after a disaster already happened in their countries. Central Asian countries have a chance to be proactive and not wait until catastrophe happens to start investing in earthquake risk reduction. These investments should be included in the countries' development programs.

WHAT ARE WE DOING TO REDUCE THE EXISTING RISK?

SESSION OBJECTIVES: to understand what earthquake risk reduction activities different ministries around Central Asia are involved in

Presentations by:

Ms. Toktokan Ashimbaeva, Deputy Minister of Education, Kyrgyz Republic

Ms. Zulfiya Azizova, Chief Specialist of Emergency Situations and Emergency Medical Assistance Department under the Head Office of Sanitary and Epidemiological Protection, Ministry of Health and Social Protection, Republic of Tajikistan

Mr. Dovran Bezirgenov, Chief Specialist of the Monitoring Unit of the Scientific-Research Institute of Seismic Resistant Construction of the Ministry of Construction and Architecture, Turkmenistan

Mr. Shamil Khakimov, Head of the Unit of Seismic Resistance Construction of ToshuyjoyLITI, State Committee for Architecture and Construction, Republic of Uzbekistan

Session Moderator:

Mr. Abdurahim Muhidov, Program Officer, Central Asia & South Caucasus, UNISDR

MINISTRY OF EDUCATION: "SAFE SCHOOLS AND PRE-SCHOOLS IN THE KYRGYZ REPUBLIC FOR 2015-2025" PROGRAM

Supporting the education facilities to ensure safety of children is a priority of the Ministry of Education. Therefore, a safe schools program is also a priority in the National Sustainable Development Strategy and in the National Education Strategy. When looking at education facilities, three levels of safety are considered: physical safety, safety from natural and man-made disasters, and safety of engineering systems. In order to ensure this safety, "Safe schools and pre-schools in the Kyrgyz Republic for 2015-2025" program was developed and approved in Kyrgyz Republic.

In Kyrgyz Republic, 1,716 schools were built before 1990s (about 80% of all schools). This means that most of buildings are depreciating, where capital refurbishment or strengthening has not been done. Thus the safety of children became a very obvious matter. Kyrgyz Republic jointly with other Government agencies and UNICEF conducted a disaster risk assessment of the school. More than 3,000 education and pre-school facilities were assessed. About 80% of institutions have a high level of risk. Only 20% of institutions have moderate or low risk levels. Based on these results, the "Safe schools and pre-schools in the Kyrgyz Republic for 2015-2024" program stipulates annual retrofitting and refurbishment or new construction of 10% of education and pre-school facilities.

The school and pre-school safety information system also exists in the Kyrgyz Republic. It contains a database of schools with information on school safety. This database is also integrated in the database of the Ministry of Emergency Situation and includes seismic map that is overlaid with the school inventory.

The Ministry of Education also developed education programs in the event of disasters through legal and normative documents, which include awareness raising activities for parents and schoolchildren. In 2015, an action plan to improve disaster preparedness of education sector until 2017 was developed.

Overall, the expected outcomes of the "Safe schools and pre-schools in the Kyrgyz Republic for 2015-2025" program are to ensure safety of children in schools, to halve the 2025 economic damage as compared to 2010, to reduce the number of lives lost in emergency situations to zero by 2024, and to reduce the number of consequences from emergencies for the education system to a minimum.

MINISTRY OF HEALTH AND SOCIAL PROTECTION: PREPAREDNESS OF THE HEALTH SECTOR TO EMERGENCY SITUATIONS IN THE REPUBLIC OF TAJIKISTAN

The health system of the Republic of Tajikistan operates under various legal acts and orders of the Government and government institutions of the Republic of Tajikistan. Natural disasters are considered a threat to the national safety according to the law. Coordination of medical emergency response and preparedness is under the responsibility of the Ministry of Health, which is in charge of developing various legal acts for preparedness. Planning is an important aspect of preparedness activities and the disaster response plans focus on protection of people and key facilities (non-military facilities). The following units are established for rescue activities: medical aid posts, medical units, medical observation posts, anti-epidemic units, first aid groups and others.

The state preparedness in the Republic of Tajikistan is tested through various drills and training sessions. These trainings are important since 93% of the territory is mountainous and is considered a highly seismic area with around 3,000 earthquakes occurring annually. Even moderate earthquakes pose a great risk to the population of Tajikistan.

MINISTRY OF CONSTRUCTION AND ARCHITECTURE: ACHIEVEMENTS OF TURKMENISTAN'S RESEARCH INSTITUTE OF SEISMIC RESISTANT CONSTRUCTION

Turkmenistan is a country with five regions that has borders with Iran, Kazakhstan, Uzbekistan, Afghanistan and Caspian sea. The country is located in a highly seismic area, where parts of it are prone to earthquakes of magnitude 6-9 . On October 6, 1948, Ashgabat was hit by a strong earthquake causing fatalities of about 100,000 and was one of the strongest earthquakes in the 20th century. The most active seismic area in the country is around Ashgabat, and therefore, seismic safety in construction is reinforced with the use of earthquake resistant construction materials.

Issues that have to do with seismic hazard and seismically resistant construction in Turkmenistan are managed by the National Seismic Survey and the Institute of Seismology under the Academy of Sciences, and the Research Institute of Seismic Resistant Construction of the Ministry of Construction and Architecture. Various laboratories of the Research Institute of Seismic Resistance Construction develop norms and standards for construction of facilities and construction materials and various zoning maps are developed and modified regularly. For example, the concrete laboratory tests various temperature regimes and earthquake resistant concrete types for construction purposes. The research institute develops standards and technical documentation, as well as new methods of calculation that increase the stability and reliability of buildings and structures. In the recent past, some 50 seismically resistant bridges were built in Turkmenistan. The research institute also oversees the state control for building code compliance.

JOINT-STOCK COMPANY "TOSHUYJOYLITI": SEISMIC RISK REDUCTION OF BUILDINGS IN URBAN AND RURAL AREAS OF THE REPUBLIC OF UZBEKISTAN

More than 40% of Central Asian population resides in seismically vulnerably buildings. On the territory of the Republic of Uzbekistan there are three commonly found types of buildings: (1) rural private housing (often times, construction is done without attracting professional constructors, which causes more damages during earthquake events); (2) brick buildings of complex design; and (3) residential and civil buildings from reinforced concrete.

The main reasons for damages and losses from earthquake events are due to improper construction method, low awareness of population on construction methods and lack on ways to influence individuals to adhere to the construction norms. Most of the damages are caused by poor quality construction and lack of control during construction process. Uzbekistan takes measures by limiting the allowable number of floors to be built for different construction types.

Under the 2009-2014 state rural development program, some 44,000 rural houses have been built using reinforced materials and in accordance with earth-

quake construction norms and 11,000 more houses are planned to be built in 2015.

The joint-stock company "Tashkent scientific-research and project design and survey institute of housing and civil construction" (JSC "ToshuyjoyLITI") makes a number of recommendations to improve the quality of buildings and incorporates them in the construction norms and standards. The Republic of Uzbekistan also conducted risk assessment in 10,000 schools, with a summary that 42% need basic repair works, 29% need capital reconstruction, 24% require capital maintenance, and 5% are subject to demolishment and reconstruction.

There are six proposals for seismic risk reduction projects by JSC "ToshuyjoyLITI":

(1) Increase the seismic safety capacity of the population and improve infrastructure through education on basic principles of earthquake resistant construction

(2) Enhancement of seismic resilience capacity in private residences in rural and urban areas

(3) Creation of incentives for seismic risk reduction in the cities and providing safety for citizens

(4) Seismic risk assessment of new generation of buildings and preparation of according legislation

(5) Preparation of building certification of existing and new buildings to determine risk index of cities

(6) Development of activities aimed at retrofitting and reinforcement of existing structures

Conclusions

(1) Central Asian countries have started some programs to reduce earthquake risk in schools, hospitals and public buildings. However, there has not been a systematic approach to investing in comprehensive programs covering all sectors at risk.

(2) Building codes are mostly based on old hazard maps and require integration of new hazard information and update to reflect modern seismic resistant design and construction techniques.

(3) There is a need for improved methods and control mechanisms in construction quality as well as building code enforcement.

OVERCOMING CHALLENGES IN URBAN RESILIENCE

SESSION OBJECTIVES: see how cities overcome challenges in urban resilience through the "Making Cities Resilient" program and understand how large cities in Central Asia are becoming resilient to earthquakes

Presented and Moderated by

Ms. Madhavi Malalgoda Ariyabandu, Sub-Regional Coordinator, Central Asia & South Caucasus, UNISDR

Round-table Participants:

Mr. Bakytbek Dyuishembiev, Vice-Mayor of Bishkek, Kyrgyz Republic

Mr. Pulat Yasunov, Deputy of the Dushanbe City Parliamentarian Council; Deputy Head of Institute of Geology, Earthquake Engineering, and Seismology under the Academy of Sciences of the Republic of Tajikistan

Mr. Bakhtier Rakhmanov, First Deputy Khokim of Tashkent city, Republic of Uzbekistan

URBAN CHALLENGES AND THE UNISDR "MAKING CITIES RESILIENT" CAMPAIGN

In today's world, urbanization and rapid population growth lead to the concentration of population living in hazard- and risk-prone urban areas, where more than half of the world lives in urban areas. In Central Asia, urban share of the population is over 40% with an increasing growth trend. This region has a high exposure to a range of natural hazards such as earthquakes, floods, landslides, mudslides, avalanches and sand storms. Most existing residential, public and industrial infrastructure in the cities is built in 1970-80s, with poor maintenance and inconsistent compliance to outdated building codes. Rapidly expanding economic activities can also lead to sub-standard and un-safe construction. The UNISDR Making Cities Resilient Campaign, which was originally planned for 2010-2011 but was extended to 2015, is based on the previous World Disaster Reduction Campaigns on safe schools and hospitals. The goal of the campaign is to achieve resilient, sustainable urban communities and on a long term empower local governments with stronger national policies to invest in risk reduction at local level as part of their development plans. The approach of the campaign is to get as many local government ready as possible, in order to span a global network of fully engaged cities of different sizes, characteristics, risk profiles and locations. A set of tools was developed with campaign cities and partners which include the following:

The Ten Essentials: a ten-point checklist and the building block for disaster risk reduction, developed in line with the five priorities of the Hyogo Framework for Action

Reports, Guidelines and References: handbook for local government leaders - how to make cities more resilient

Self Assessment Tools: Local Government Self Assessment Tool (LG-SAT), City Resilient Score Card

Campaign Website (www.unisdr.org/campaign): city pages, role models, champions, partners, tools & resources

Currently there are four cities in Central Asia that are participating in the "Making Cities Resilient" campaign: Ust-Kamenogorsk and Ridder in Kazakhstan, and Bishkek and Karakol in Kyrgyzstan.

CURRENT SITUATION IN CENTRAL ASIA CITIES

BISHKEK, KYRGYZ REPUBLIC

Recently the DRM master plan was unveiled, which necessitates a lot of work to be done. The intent is to set up Coordination Council at city level to coordinate all efforts related to DRM and ensure collaboration with all key players. Old building norms and regulations, or SNIP's, should be revised and public awareness should be strengthened.

DUSHANBE, REPUBLIC OF TAJIKISTAN

In Dushanbe a lot of repairing and construction works are ongoing, where 70-80% are done through external investments. The main challenges the city faces are the lack of coordination and overlapping of the projects. At times, when international projects propose and use their own methodology, local experts do not have the capacity to use and accept those methodologies. Therefore, in the future closer collaboration should be established that will build on the existing work and take advantage of the local expertise.

TASHKENT, REPUBLIC OF UZBEKISTAN.

In 2005, a special fund for capital repairing was set up by the President of Uzbekistan, where as a first priority schools, kindergarten, and universities were repaired and retrofitted. Currently lifelines and communal infrastructure, such as heating systems, pump stations, and electrical infrastructure are being repaired.

Conclusions

(1) The main challenges that urban centers in Central Asia face are outdated norms and regulations for construction, lack of hazard information and assessment of the condition of public infrastructure, private residences being built without compliance with seismic code and lack of coordination in some DRM works.

(2) These challenges can be overcome by conducting hazard and risk assessments for municipalities, while working closely with the stakeholders and addressing their needs. Conducting public awareness campaigns can help raise awareness among individuals about the importance of seismic resistant construction.

(3) Knowledge and experience sharing should be done on a regional level and with countries who have previously conducted urban resilience projects, such as Turkey.

REDUCING FISCAL VULNERABILITY

SESSION OBJECTIVES: to give an overview of ways to finance contingent liabilities due to natural disasters and see what Central Asian countries are doing to financially prepare their countries for natural disaster

Presented and Moderated by

Mr. Hector Ibarra Pando, Lead Financial Officer, World Bank

Round-table Participants:

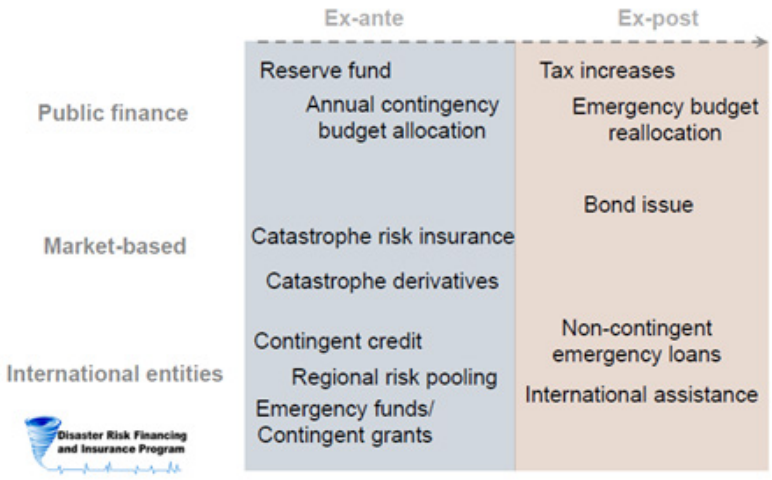
Mr. Ulukbek Karmyshakov, Deputy Minister of the Ministry of Finance, Kyrgyz Republic

Ms. Mehrinamo Jonmamadova, Deputy Minister of the Ministry of Finance, Republic of Tajikistan

Ms. Marina Shapovalova, Managing Director, JSC "Guarantee Insurance Payments Fund", Republic of Kazakhstan

FINANCIAL PROTECTION AGAINST DISASTERS

Disasters can have substantial and varied financial impacts on countries. For example, the recent 2015 Nepal Earthquake had an estimated total economic impact of US$7 billion, which is roughly a third of the county's economy. In order to help reduce their fiscal vulnerability to natural hazards and improve the financial response capacity, countries should engage in ex-ante financial planning. This will help ensure reduced cost of capital, rapid mobilization of funds and greater discipline in post-disaster spending and clarification of ownership of risk. There are different financial tools that are available for different purposes, with some of them shown in the figure.



It is also important that the funds are mobilized according to the time of needs and can be accessed efficiently when a disaster strikes. Some examples of financial protection measures around the world include Mexico's national fund for disasters that promotes financial discipline and minimized budget disruption, Turkish catastrophe insurance pool that increases insurance uptake, and the Marshall Islands' disaster assistance emergency fund and sovereign insurance which allows access to external financial capacity. It should also be noted that financial protection is one of the essential components of disaster risk management.

Q&A SESSION

Q: WHAT IS YOUR COUNTRY'S STRATEGY FOR DISASTER FINANCING?

KYRGYZ REPUBLIC. The fiscal budget has special reserves and there is capital investing in reconstruction works. Private homes who suffer from earthquakes damages are given subsidies. A national insurance pool is also being created.

REPUBLIC OF TAJIKISTAN. Funds are allocated from the national budget for unexpected emergency situations and procurement of equipment for the Committee of Emergency Situations and Civil Defence. Funds are also given to the government construction agencies for construction and reconstruction from natural disasters. The Government also provides compensation to victims on natural disasters as well as damaged public buildings such as schools and hospitals.

REPUBLIC OF KAZAKHSTAN INSURANCE ASSOCIATION. Annual losses due to natural disasters in the country are very large, estimated at 9 billion KZT, with only 1% of residences insured as part of a package. Currently, legislation is being developed for insuring individuals against natural disasters, which may take effect in 2017 at the earliest. The success of the program necessitates that individuals are receptive to insurance policies, governments are be ready to implement these policies, and the capital should not be contained by solely the government but synergy be established between the government and the insurance association.

Q: HOW WILL THE NATIONAL INSURANCE ENTITY BE SET UP IN THE KYRGYZ REPUBLIC?

A: It will be a combination of government allocated funds, help from the Russian-Kyrgyz fund and contribution from the private insurance market.

Q: IN A CASE OF A BIG DISASTER, HOW WILL THE REPUBLIC OF TAJIKISTAN COVER THE FUNDING GAP?

A: If the annually allocated funds are not sufficient, there are other reserves available as well as support from other government agencies. In previous years, no international help was required to deal with natural disasters; however, in 2015 the country had a landslide whose management required international support.

Q: WHAT ARE THE MAIN CONSTRAINTS THAT ARE LIMITING THE IMPLEMENTATION OF CATASTROPHE INSURANCE IN KAZAKHSTAN?

A: The government support to the citizens in case of emergency situations causes the individuals to become reliant on government for financial protection. This reliance poses a challenge for implementation and integration of catastrophe insurance in the country.

Q: DUE TO THE LACK OF STRONG INSURANCE AND REINSURANCE MARKETS AND OTHER FACTORS, WILL A REGIONAL LEVEL INSURANCE POOL BE HELPFUL?

REPUBLIC OF KAZAKHSTAN INSURANCE ASSOCIATION.
A good example of a functional insurance pool is the Turkish pool which was developed by the World Bank. However, in order to implement regional insurance in Central Asia, individual countries have to have insurance technology and then think about regional pooling, which is currently not available.

Conclusions

(1) The majority of the Central Asian countries have been responding to large disasters through reserve funds, budget reallocations and international financial support.

(2) Currently the Central Asian countries rely on post disaster financial mechanisms to finance the negative consequences of catastrophes. Therefore, a need to develop a better understanding of the contingency liabilities was identified in order to explore ex-ante financial mechanisms and create a more efficient risk financing strategy.

(3) Some countries in Central Asia have started to develop catastrophe insurance mechanisms, such as the Republic of Kazakhstan and the Kyrgyz Republic. Nevertheless, these insurance markets are at the beginning stage and countries have identified the need for capacity building in this area.

CLOSING REMARKS

JOAQUIN TORO, REGIONAL DISASTER RISK MANAGEMENT COORDINATOR FOR EUROPE AND CENTRAL ASIA, WORLD BANK

Throughout the two Forum days, we learned and discussed many challenges and achievements in the area of seismic risk reduction in both the Central Asia region and other parts of the world. We heard addresses from the Regional Director of the World Bank, the Governor of Hyogo Prefecture in Japan, and the Director of ISMEP in Istanbul, who shared their personal experience of living through a large disaster and how that experience impacted their understanding of the importance of investing in DRM.

The Forum introduced the work that the emergency management agencies are doing in Central Asia and how they are getting prepared for the next earthquake. A lot of progress has been reached in emergency preparedness, with a focus on citizen awareness and early warning systems; however, there is still a lot of work to be done to create earthquake resilience. We also got to see why understanding risk is important and why we should conduct risk assessments, as they help inform us of the economic, financial, infrastructure, and human losses we can expect, and help plan out the proper response and prioritization of investments.

During the Forum we also saw that each of the Central Asia countries has an institution dedicated to the study of seismology and there have been a large number of studies conducted on seismic hazard in the region. What we must now consider is how to improve the existing data and the information we need in order to conduct seismic risk assessments. There is also a need for closer coordination between the local and international partners on these studies in order to build local capacity.

Examples of international work in seismic risk reduction were given during a session with representatives from Bangladesh, Japan, and Turkey. Bangladesh faces an increase in urbanization and therefore must plan accordingly, as evident by the ongoing urban resilience program in Dhaka. Japan has shown a long history of learning from previous disasters, where they are continuously improving their legislation and sharing their experience internationally. Turkey took a comprehensive approach to seismic risk reduction, considering cross-sectoral benefits; for example, during seismic retrofitting of schools, energy efficiency as well as quality of education were considered and improved.

At the end of the two days it was evident that there is a clear need for improved and useful seismic risk information. However, we cannot wait until the perfect information is available to take action in Central Asia. We must recognize the difficulty and complexity of decision-making under highly uncertain circumstances, such as earthquake occurrence, and move forward with risk reduction investments by leveraging international experience. We saw that there are several countries that are 'champions' in the area of earthquake risk reduction, with large programs being implemented in Japan, Turkey and Bangladesh. What we need in Central Asia is to find such 'champions' to promote systematic response to seismic risk and make disaster risk management a shared reasonability between the government agencies, academic institutions, NGO's, development partners and individual citizens. Based on the conclusions from the Central Asia Earthquake Risk Reduction Forum, the World Bank team will continue to work with the Central Asian countries and development partners on earthquake risk reduction programs and integrating disaster risk management into the countries' development.

LIST OF PARTICIPANTS

DAY 1: OCTOBER 27TH, 2015

OPENING CEREMONY

Mr. Saroj Kumar Jha, Regional Director for Central Asia, World Bank
Mr. Toshizo Ido, Governor, Hyogo Prefecture, Japan
Mr. Kazım Gökhan Elgin, Director, Istanbul Governorship, Istanbul Project Coordination Unit (IPCU), Turkey

PRESENTATION SESSION 1: ARE WE PREPARED FOR THE NEXT ONE?

Mr. Carlos Afonso, Regional Director, European Commission, Directorate-General for Humanitarian Aid and Civil Protection (ECHO)
Mr. Zhasulan Dzhumashev, Deputy Chairman, Committee of Emergency Situations, Ministry of Internal Affairs, Republic of Kazakhstan
Mr. Talaibek Temiraliev, State Secretary of the Ministry of Emergency situations, Kyrgyz Republic
Mr. Fahriddin Gulomov, Head of Department on Civil & Territories Defence, Ministry of Emergencies, Republic of Uzbekistan
Mr. Idibek Buriev, Head of Population and Territories Protection Department, Committee of Emergency Situations and Civil Defense, Republic of Tajikistan
Ms. Elzat Mamutalieva, Community-Based Disaster Risk Management (CBDRM) Delegate, Swiss Red Cross, Kyrgyz Republic

PRESENTATION SESSION 2: UNDERSTANDING RISK WITH A PURPOSE

Mr. Michael Haas, GFZ German Research Centre for Geoscience
Mr. Yannis Fourniadis, Senior Engineering Geologist, Arup
Mr. Tatsuo Narafu, Senior Advisor, Japan International Cooperation Agency (JICA)
Ms. Maryia Markhvida, Disaster Risk Management Analyst, World Bank

PRESENTATION SESSION 3: WHAT DO WE KNOW ABOUT OUR SEISMIC RISK?

Mr. Tanatkan Abakanov, Director, Ph.D., Academician KazNAU, UNESCO expert on the issue of earthquakes, Institute of Seismology, Republic of Kazakhstan
Mr. Kanatbek Abdrakhmatov, Director of the Institute of Seismology of the Kyrgyz Republic
Mr. Anatoly Ishchuk, Head of Seismic Hazard Assessment and Geoecology Department of the Institute of Geology, Earthquake Engineering and Seismology of the Academy of Sciences, Republic of Tajikistan
Ms. Guljemal Saryeva, Director of the Institute of Seismology and Atmosphere Physics of the Academy of Science of Turkmenistan
Mr. Sabriddin Husameddinov, Director, Institute of Seismology, under Academy of Sciences, Republic of Uzbekistan
Mr. Bolot Moldobekov, Director of the Central Asia institute for Geosciences, Kyrgyz Republic

DAY 2: OCTOBER 28TH, 2015

PRESENTATION SESSION 1: INVESTING IN SAFER INFRASTRUCTURE

Ms. Swarna Kazi, Disaster Risk Management Specialist, World Bank
Mr. Kazuhisa Fujii, Director for Overseas Project, Overseas Project Division, Policy Bureau, Ministry of Land, Infrastructure, Transport and Tourism (MLIT), Japan

Mr. Kazım Gökhan Elgin, Director, Istanbul Governorship, Istanbul Project Coordination Unit (IPCU)
Ms. Kristine Tovmasyan, Programme Specialist for Natural Sciences, UNESCO cluster (sub-regional) office for Central Asia, UNESCO

PRESENTATION SESSION 2: WHAT ARE WE DOING TO REDUCE THE EXISTING RISK?

Ms. Toktokan Ashimbaeva, Deputy Minister of Education of the Kyrgyz Republic
Ms. Zulfiya Azizova, Chief Specialist of Emergency Situations and Emergency Medical Assistance Department under the Head Office of Sanitary and Epidemiological Protection, Emergency Situations and Emergency Medical Assistance of the Ministry of Health and Social Protection, Republic of Tajikistan
Mr. Dovran Bezirgenov, Chief Specialist of the Monitoring Unit of the Scientific-Research Institute of Seismic Resistant Construction of the Ministry of Construction and Architecture of Turkmenistan
Mr. Shamil Khakimov, Head, Unit of Seismic Resistance Construction of ToshuyjoyLITI, State Committee for Architecture and Construction, Republic of Uzbekistan
Mr. Abdurahim Muhidov, Program Officer at United Nations Office for Disaster Risk Reduction (UNISDR), Republic of Kazakhstan

AMBASSADOR OF JAPAN FORUM ADDRESS

H.E. Mr. Masayoshi Kamohara, Ambassador Extraordinary and Plenipotentiary of Japan to Kazakhstan

PRESENTATION SESSION 3: OVERCOMING CHALLENGES IN URBAN RESILIENCE

Ms. Madhavi Malalgoda Ariyabandu, Sub-Regional Coordinator, United Nations Office for Disaster Risk Reduction (UNISDR)
Mr. Bakytbek Dyuishembiev, Vice-Mayor of Bishkek, Kyrgyz Republic
Mr. Pulat Yasunov, Deputy of the Dushanbe City Parliamentarian Council; Deputy Head of Institute of Geology, Earthquake Engineering, and Seismology under the Academy of Sciences, Republic of Tajikistan
Mr. Bakhtier Rakhmanov, First Deputy Khokim of Tashkent city, Republic of Uzbekistan

PRESENTATION SESSION 4: REDUCING FISCAL VULNERABILITY

Mr. Hector Ibarra Pando, Lead Financial Officer, World Bank
Ms. Marina Shapovalova, Managing Director, JSC Guarantee Insurance Payments Fund, Republic of Kazakhstan
Mr. Ulukbek Karmyshakov, Deputy Minister of Finance of the Kyrgyz Republic
Ms. Mehrinamo Jonmamadova, Deputy Minister of Finance, Ministry of Finance of the Republic of Tajikistan

CLOSING CEREMONY

Mr. Jose C. Joaquin Toro Landivar, Senior Disaster Risk Management Specialist, World Bank

OTHER FORUM DELEGATES

Mr. Anatoly Li, Deputy Director for Science, Ph.D., Member of Corresponding KazNAU, Institute of Seismology, Republic of Kazakhstan
Mr. Maksim Kan, Engineer of the highest category, Institute of Seismology, Republic of Kazakhstan
Ms. Dilara Karakulova, Chairman of the Board of JSC Fund of guaranteeing insurance payments
Mr. Paul Zavalko, Director General Association of Insurance Companies of Kazakhstan

Ms. Ayara Midin, Acting Senior Specialist of International Department, Mayor Office, Kyrgyz Republic
Mr. Rustam Aleyev, Director General of Red Crescent Society of Kyrgyz Republic

Mr. Rustam Shohiyon, First Deputy Chairman of the Committee for Emergency Situations and Civil Defense, Republic of Tajikistan
Mr. Kudratullo Fayzulloev, Chief of Architecture and Urban Planning Department of the Municipality of Dushanbe (Chief Architect), Republic of Tajikistan

Mr. Bakhrom Khaitbaev, Acting Deputy General Director of ToshuyjoyLITI, State Committee for Architecture and Construction, Republic of Uzbekistan

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EARTHQUAKE HAZARD OVERVIEW OF CENTRAL ASIAN COUNTRIES

REPUBLIC OF KAZAKHSTAN

The Republic of Kazakhstan is the world's largest land-locked country that is made up of 15 regions, or oblasts, and two independent cities, Almaty and Astana. As of 2015, the population of the Republic of Kazakhstan is 17.4 million with an increasing annual trend of 1.4% over the past 6 years. The majority of the population are urban dwellers, with 57% of the population living in cities[1]. The southeastern part of Kazakhstan lies in a seismically active zone at the foothills of Zailysky-Alatau mountains, a sub-range of Tien-Shan. The earth's crust movement in this area is thought to be due to the collision of India and Eurasia plates[2].

Almaty is Kazakhstan's most populous city with 1.6 million people, which account for 9% of the county's population. Almaty was the former capital of the Republic of Kazakhstan, until it was moved to the city of Astana in 1997. Today, it is an urban center of Kazakhstan, with a large financial center housing one of the biggest bank in Central Asia and the Kazakhstan Stock Exchange.

Over the last century, the most significant historical earthquakes in the Republic of Kazakhstan occurred in the vicinity of the city of Almaty. In 1887 and 1889, two earthquakes known as Verny (M7.3) and Chilik (M8.3) struck the city of Almaty. Shaking of IX-X and VII-VIII were felt, respectively[3]. In 1911, a magnitude M7.8 earthquake, known as the Kebin or Chon-Kemin earthquake, occurred on the territory of Kazakhstan. The earthquake killed more than 450 people and destroyed over 770 brick buildings in Almaty[4]. In May 2003, a M5.4 earthquake occurred in Zhambyl Region, which affected 43,300 people and caused great devastation to housing and social infrastructure[5]. Furthermore, on 1 December 2003, a Mw 6.0 earthquake occurred on the Kazakhstan-Xinjiang Border. Most of the damage and fatalities occurred in China, however, strong shaking was also felt in the southeastern part of Kazakhstan[6].

1 Ministry of National Economy of the Republic of Kazakhstan, Committee of Statistics: Population Data

2 Geological Society of London. "Asia's Broken Foreland: Faulting and Earthquakes in Kazakhstan." Geoscientist 227.7 (2012)

3 King, S.A, Khalturin, V.I., Tucker, B.E. "Seismic hazard and building vulnerability in post-Soviet Central Asian Republics" (1999)

4 United States Geological Survey: http://earthquake.usgs.gov/learn/today/index.php?month=1&day=3&submit=View+Date

5 UNDP Report. "Local Risk Management in Earthquake Zones of Kazakhstan": http://www.undp.kz/projects/files/171-16940.pdf

6 United States Geological Survey: http://earthquake.usgs.gov/earthquakes/eqarchives/significant/sig_2003.php

KYRGYZ REPUBLIC

Kyrgyz Republic, is a land locked country located in a mountainous region of Tien-Shan mountains, an active seismic zone. Due to the mountainous landscape and a combination of soil and water-level conditions, many sites throughout Kyrgyzstan are also prone to landslides. Kyrgyz Republic is comprised of 7 regions, or oblasts, and 2 administratively independent cities, Osh and the capital city of Bishkek. Regions are further subdivides into districts with local governments. The population of Kyrgyzstan is 5.8 million (2014) with an increasing trend, where 36% of people are living in urban areas[1].

Kyrgyz Republic is classified as one of the most seismically dangerous territory in Eurasia with over 300 earthquakes registered annually[2]. According to the Ministry of Emergency Situations, about 3.3 million people or 66% of the population live in houses highly vulnerable to strong earthquakes. Over the period of 1988-2007 the largest number of deaths caused by natural disasters was from landslides (238) and earthquakes (58). Earthquakes, however, are the hazard that caused highest economic losses (US $163 million) and affected the largest number of people on the territory of Kyrgyzstan[3]. On a long-term scale, earthquakes are the greatest hazard to the population of Kyrgyz Republic. The area that can experience ground shaking of intensity IX (MSK-scale) comprises of about 20% of the territory of Kyrgyzstan, and around 79% can be subject to VIII point intensity[4].

In the last 25 years, Kyrgyz Republic experienced a number of damaging earthquakes. A M6.6 earthquake occurred on 15 May 1992, causing 4 fatalities and an estimated economic loss of US$31 million[5]. Three months later, on 19 August 1992, a M7.3 earthquake hit near the village of Toluk. It killed an estimated 54 people, 14 of which were killed by a triggered landslide, and destroyed more than 8,200 dwellings[6,7]. In January 1997, the Naryn region was shaken by a M7 earthquake, around 200km south of Bishkek[8]. The region saw damage to more than 400 houses and an estimated US $2 million worth of damage[9]. More recently, on 5 October 2008, a M6.7 earthquake happened in south Kyrgyzstan, near the intersection of the borders of Kyrgyzstan, Tajikistan, and China. The earthquake severely damaged village of Nura and killed 75 people[10]. In July 2011, a M6.1 earthquake occurred near the intersection of the borders of Kyrgyzstan, Tajikistan, and Uzbekistan. Although most of the casualties occurred in Uzbekistan, the earthquake was felt in Bishkek and Jalal-Abad and caused power outages in Batken[11]

1 World Bank Data. (2014): http://data.worldbank.org/country/kyrgyz-republic
2 Ministry of Emergency Situations: Annual Edition on the Forecast and Monitoring of Disasters Guide (2009).
3 UNISDR Report. "In-depth Review of Disaster Risk Reduction in Kyrgyz Republic". (2010): http://www.unisdr.org/files/14436_14436INDEPTHREVIEWOFDRRINKRfinal1.pdf
4 Government Decree:"Complex Strategy for Protection of Population and Territory of the Kyrgyz Republic in Emergency Situations until 2020":http://www.mes.kg/ru/strategiya-komplexsnoe-bezopasnosti/postanovleniya/
5 EM-DAT: The OFDA/CRED International Disaster Database, www.emdat.be, Université Catholique de Louvain, Brussels (Belgium);
6 United States Geological Survey: http://earthquake.usgs.gov/earthquakes/eventpage/usp0005cq0#general_summary
7 HFA Progress Report. Kyrgyz Republic.
8 Kyrgyzstan Earthquake Situation Report No. 1 (1997): http://reliefweb.int/report/kyrgyzstan/kyrgyzstan-earthquake-situation-report-no-1
9 Kyrgyzstan Earthquake Situation Report No. 2 (1997): http://reliefweb.int/report/kyrgyzstan/kyrgyzstan-earthquake-situation-report-no2
10 United States Geological Survey: http://earthquake.usgs.gov/earthquakes/eqinthenews/2008/us2008xuay/#summary
11 United States Geological Survey: http://earthquake.usgs.gov/earthquakes/eqinthenews/2011/usc00050ll/#summary

REPUBLIC OF TAJIKISTAN

The Republic of Tajikistan is comprised of 4 regions and one independent city: Sughd and Khatlon regions, Gorno-Badakhshan Autonomout Republic (GBAO), Region of Republican Subordination, and the city of Dushanbe. Each of the regions is further subdivided into districts (58 total), which are in turn divided into jamoats (570). In total there are 17 cities in the republic, with capital city of Dushanbe. The total population of Tajikistan is 8.2 million (2014) with only 26.6% of the population living in urban areas. Around 9.5% of the population resides in Dushanbe[1].

Tajikistan is subject to many natural hazards such as earthquakes, landslides, mudflows, avalanches, floods, drought, heavy snowfalls and others. High seismicity in the country is caused by the northward-moving Indian plate colliding with the Eurasian plate. According to the Global Seismic Hazard Map, Tajikistan is located in a high-hazard area, where most of the country exhibits intensities of VIII–IX for a hazard level of 5% exceedance in 50 years[2]. As seen from seismic events in the 20th century, the damage and fatalities are often caused by secondary effects such as landslides, rockslides, mudflows and avalanches.

In the 20th century there was a number of damaging earthquakes that occurred on the territory of Tajikistan[3]:

- 1907 Karatag earthquake, M7.3, intensity at epicenter IX (MSK scale)
- 1911 Sarez earthquake,Ms7.4, triggered a massive landslide which destroyed the Usoy village with all its residents and blocked the Murghab River, thereby creating the Sarez Lake [4]
- 1943 Faizabad earthquake, M6.0, intensity at epicenter VIII-IX (MSK scale)
- 1949 Khait earthquake, M7.5, intensity at epicenter IX-X (MSK scale), triggered a series of landslides which buried the town of Khait with an estimated death toll of 12,000 people[5]

Since the 2000's, there were several damaging earthquake events in Tajikistan. Some of these earthquakes occurred in Khatlon region (2006) Vanj district (2010), and Rasht Valley (2012) . The latest significant M_w7.2 earthquake occurred on December 7, 2015, in the Murghob district of Gorno-Badakhshan Autonomous Oblast (GBAO). Losses consisted of 2 fatalities caused by landslides, 10 injuries, complete or partial destruction of 660 houses and 15 schools and kindergartens, damages to several health centers and a small hydroelectric power station, and loss of livestock [6]. Estimates suggest that 4,000 people have been displaced and over 124,000 were affected by the earthquake.

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1 Republic of Tajikistan Statistics Agency. "Population Count of the Republic of Tajikistan as of 1 January, 2014": http://www.stat.tj/en/img/b417f44e3113e555ffff3cd143d5b3fe_1404817165.pdf

2 Pilz, M., Bindi, D., Boxberger, T., Hakimov, F., Moldobekov, B., Murodkulov, S., ... & Parolai, S. (2013). First steps toward a reassessment of the seismic risk of the city of Dushanbe (Tajikistan). Seismological Research Letters, 84(6), 1026-1038

3 Negmatullaev, S., Iscuk, A., & Potekhin, Y. (1999). Seismic hazard and building vulnerability in Tajikistan. In Seismic Hazard and Building Vulnerability in Post-Soviet Central Asian Republics (pp. 107-125). Springer Netherlands.

4 National Center for Environmental Information: http://www.ngdc.noaa.gov/nndc/struts/results?eq_0=7868&t=101650&s=13&d=22,26,13,12&nd=display

5 United States Geological Survey: http://earthquake.usgs.gov/earthquakes/world/events/1949_07_10.php

6 REACT: GBAO earthquake, Situation Report No.6, 21 December 2015

TURKMENISTAN

Turkmenistan is comprised of 5 provinces and one capital city district. The majority of the country is covered by the Karakum Desert. On the west side, the country is bordered by the Caspian Sea, and in the southwest the Kopet-Dag mountain range stretches along the Iranian border. The capital city, Ashgabat, is located in the foothills of the Kopet-Dag. As of 2014, the population of Turkmenistan was 5.3 million, with 50% of people living in urban areas[1].

Due to its geographical features, the country is prone to mudflows, cyclones, tornadoes, sand storms, flooding, and earthquakes. Since most of the country is located in a seismically active zone, earthquakes are the dominant natural hazard of Turkmenistan, followed by flood[2]. Earthquakes amount to an average annual loss of $72 million, where as floods have a loss of $7 million[3].

The most significant earthquake in Turkmenistan happened on October 6th, 1948. During this event, Ashgabat and the nearby area were devastated by a magnitude M7.3 earthquake, which occurred 25 km south-east of the capital. The city saw intensities up to X (MSK scale), which caused most of the city to be destroyed[4]. Almost all brick buildings in the city collapsed and concrete structures saw a high level of damage[5]. The death toll was classified during the USSR; it was later revealed to be around 110,000[6]. Other large earthquakes that affected Turkmenistan in the 20th century include 1929 Kopet Dag earthquake, 1946 Kazandzhik earthquake, and 1983 Kum-Dag earthquake. In December 2000, a magnitude M7.0 earthquake occurred in Balkan region near Balkanabad, which caused several deaths and multiple injuries [7,8]

1 World Bank Data (2014): http://data.worldbank.org/country/turkmenistan

2 Ashinov, T.A., Maslov, V.A., Nursakhatov, R.G., Yakubov, A.Ya. (1994). National Report: Work and Research in Turkmenistan in Connection with the International Decade for Natural Disaster Reduction 1990-2000. Department of the Turkmenistan State Commission for Emergency Situations.

3 Central Asia and Caucasus Disaster Risk Management Initiative (CAC DRMI). "Risk Assessment for Central Asia and Caucasus". (2009).

4 Ashinov, T.A., Maslov, V.A., Nursakhatov, R.G., Yakubov, A.Ya. (1994). National Report: Work and Research in Turkmenistan in Connection with the International Decade for Natural Disaster Reduction 1990-2000. Department of the Turkmenistan State Commission for Emergency Situations.

5 United States Geological Survey. Earthquakes with 1,000 or More Deaths 1900-2014. http://earthquake.usgs.gov/earthquakes/world/world_deaths.php

6 Hasanov H. (2009). Over 176,000 people suffered earthquake in Ashgabat in 1948. Trend News Agency.

7 United States Geological Survey:http://earthquake.usgs.gov/earthquakes/eqarchives/year/2000/2000_stats.php

8 Turkmenistan: Earthquake Information Bulletin No. 1. (2000): http://reliefweb.int/report/turkmenistan/turkmenistan-earthquake-information-bulletin-no-1

REPUBLIC OF UZBEKISTAN

The Republic of Uzbekistan is located in a basin between the Amu Darya and Syr Darya rivers and is surrounded by Gissar-Alay and Tien-Shan mountain ranges in the east. The country is comprised of 12 provinces and autonomous Republic of Karakalpakstan. Uzbekistan is a country with a long history of seismic activity, particularly in the northeast Tashkent Region and the Bukhara Region in the southwest of the country. Certain areas of the republic are expected to see earthquakes of intensity IX or greater (MSK scale)[1].

As of 2014, the population of Uzbekistan was 30.5 million, with the population trend steadily increasing by an average of 1.5% per year over the last 15 years[2]. Uzbekistan's urban dwellers account for 36% of the population, with the majority of people living in rural areas.

Particular attention should be paid to Uzbek capital Tashkent, since it is the most populous city in the country and is situated in a seismically active zone. The city is located in the west part of the Tien- Shan mountain range, where ground shaking intensities can reach up to VII-IX (MSK scale) causing widespread damage and fatalities[3]. In 2014, Tashkent population was 2.4 million, which accounts for 8% of the county's population[4]. The capital city is also home to Uzbekistan's key educational, industrial, political and cultural facilities.

Due to Uzbekistan's mountainous landscape and an abundance of rivers, the population living in the mountainous areas are also exposed to a high risk of landslides and mudflows. Although landslides and mudflows can be triggered by various factors, they are often seen as a consequence of earthquakes and must be considered in seismic risk management.

Soil conditions play a large role in ground motion amplification, where soft soils have an amplification effect and saturated soils can become prone to liquefaction. Uzbek seismic code identifies 10 soil types for its territory, which are classified into 3 categories that have different seismic characteristics. In particular, Tashkent is known to have areas of unfavorable soils that increase the seismic hazard of the area.

In the last century, five notable events occurred in the region, causing widespread damage and casualties. An earthquake of magnitude 6.4 (Ms) occurred in Andijan in 1902, destroying over 40,000 houses and claiming more than 4,500 lives[5]. In 1966, Tashkent was hit by a magnitude 5.0 earthquake. Various numbers are disputed with regards to the death toll and damage incurred during this earthquake; however, the USGS reports that the earthquake killed 10 people and destroyed 27,000 of the city's buildings, leaving more than 10% of the population homeless[6]. In the southwest part of the country two large earthquake occurred in 1976 and 1984 next to the desert town of Gazli, which caused sizable economic losses.

1 Mavlyanova, N., Inagamov, R., Rakhmatullaev, H., & Tolipova, N. Seismic Code of Uzbekistan. (2004)
2 State Committee of the Republic of Uzbekistan on Statistics:
http://stat.uz/en/index.php/statinfo/demograficheskie-dannye
3 Final report on IDNDR-RADIUS Project for city of Tashkent. (1999)
4 State Committee of the Republic of Uzbekistan on Statistics.
5 National Center for Environmental Information:
http://www.ngdc.noaa.gov/nndc/struts/results?eq_0=2640&t=101650&s=13&d=22,26,13,12&nd=display
6 United States Geological Survey: http://earthquake.usgs.gov/earthquakes/world/events/1966_04_25.php