ICT for Disaster Risk Management

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National Information Technology Center
Kyrgyz Republic
Kyrgyz Republic

**Population:** 5.8 million

**Territory:** 199,500 km²

**Capital:** Bishkek
850 thousand people

**Language:** Kyrgyz (state)
Russian (official)

**Altitude:** 94% is 1000 m above sea level

**WTO:** member

*Image source at http://www.kyrgyzstan.orexca.com/*
National Information Technology Center since 2004

- Providing various ICT training (Cisco Academy, Oracle, Microsoft)
- Administering all IT certifications in Kyrgyzstan (PearsonVue, Prometric, ETS authorized testing centers)
- Network Operating Center (NOC) for Central Asian Research Education Network (CAREN) since 2009
Central Asian Research Education Network

First CAREN Regional Networking Conference
1-2 October 2014, Almaty, Kazakhstan
Members of CAREN NRENs

<table>
<thead>
<tr>
<th>Type of Institution</th>
<th>KAZRENA</th>
<th>KREN</th>
<th>TARENA</th>
<th>TURENA</th>
<th>Totals per type</th>
<th>Relative</th>
</tr>
</thead>
<tbody>
<tr>
<td>Universities and other (ISCED 5+6)</td>
<td>50</td>
<td>28</td>
<td>16</td>
<td>18</td>
<td>112</td>
<td>36%</td>
</tr>
<tr>
<td>Institutes of further education (ISCED 4)</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Information centers</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>1</td>
<td>3</td>
<td>1%</td>
</tr>
<tr>
<td>Research institutes</td>
<td>9</td>
<td>15</td>
<td>13</td>
<td>17</td>
<td>54</td>
<td>18%</td>
</tr>
<tr>
<td>Secondary schools (ISCED 2+3)</td>
<td>5</td>
<td>37</td>
<td>40</td>
<td>26</td>
<td>108</td>
<td>35%</td>
</tr>
<tr>
<td>Primary schools (ISCED 1)</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Libraries, Museums, Archives, Cultural institutions</td>
<td>1</td>
<td>3</td>
<td>4</td>
<td>1</td>
<td>9</td>
<td>3%</td>
</tr>
<tr>
<td>Hospitals (other than university hospitals)</td>
<td>1</td>
<td>5</td>
<td>2</td>
<td>5</td>
<td>13</td>
<td>4%</td>
</tr>
<tr>
<td>Government departments (national, regional, local)</td>
<td>2</td>
<td>1</td>
<td>3</td>
<td>2</td>
<td>8</td>
<td>3%</td>
</tr>
<tr>
<td>Totals per country</td>
<td>68</td>
<td>91</td>
<td>78</td>
<td>70</td>
<td>307</td>
<td></td>
</tr>
</tbody>
</table>
NITC provides Network Operating Center services

- CAREN network day to day management
- Handling migrations after upgrades or new tenders
- Interaction with CAREN partner NRENs, telecommunication companies, ISP’s
- Improving the network monitoring infrastructure
- Preparation of monthly report reports
- Introduction of new services (IPv6 and Eduroam)
- Dissemination activities of network management
- Handling network security incidents
- Technical support of the NRENs
Research collaboration

• Telemedicine
• Open and Distance learning
• Central Asia real-time monitoring of natural processes and phenomena, disaster prevention
• Regional collaboration in sustainable water resources management
• GRID computing
• IPv6 implementation
• EduRoam
Earthquake Model Central Asia (EMCA) Coordinated by GFZ
http://www.emca-gem.org/

Seismic and landslides Hazard

Microzonation

Vulnerability

Seismic and landslides Risk

National and International Projects

Stefano Parolai – GFZ German Research Centre for Geosciences
Networking

Cross-border scientific „Consortium for Earthquake Risk Reduction“ (COSERICA)

Bilateral MoU signed between GFZ and:

**Afghanistan** University of Kabul, Department of Geosciences Kabul
**Kazakhstan** LLC Institute of Seismology (IOS), **Almaty**
**Kazakhstan** National Nuclear Center, Institute of Geophysical Research, Center for Acquisition and Processing of Special Seismic Information (KNDC), **Almaty**
**Kyrgyzstan** Central-Asian Institute for Applied Geosciences (CAIAG), **Bishkek**
**Kyrgyzstan** Institute of Seismology (KIS), **Bishkek**
**Kyrgyzstan** International University for Innovation Technologies, **Bishkek**
**Kyrgyzstan** Kyrgyz State University of Construction, Transportation and Architecture, **Bishkek**
**Tajikistan** Institute of Earthquake Engineering and Seismology (IEES), **Dushanbe**
**Turkmenistan** Institute of Seismology and Earthquake Engineering, **Ashgabat**
**Turkmenistan** Scientific Res. Ins. of Seismic-resistance Const., **Ashgabat**
**Uzbekistan** Institute of Seismology of Academy of Sciences of Republic of Uzbekistan, Tashkent
Central Asia is amongst the regions with the highest earthquake hazard worldwide

GSHAP (1999)
## Vulnerability and exposure in CA

<table>
<thead>
<tr>
<th>Rank</th>
<th>Earthquake</th>
<th>Main Country</th>
<th>Date</th>
<th>Median Fatalities</th>
<th>CATDAT Lower/Upper</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Haiyuan</td>
<td>China</td>
<td>16.12.1920</td>
<td>273400</td>
<td>235502-273400</td>
<td>Zhang et al., 2010</td>
</tr>
<tr>
<td>2</td>
<td>Tangshan</td>
<td>China</td>
<td>27.07.1976</td>
<td>242419</td>
<td>240000-255000</td>
<td>Yong et al., 1989</td>
</tr>
<tr>
<td>4</td>
<td>Haiti*</td>
<td>Haiti*</td>
<td>12.01.2010</td>
<td>222500*</td>
<td>92000-225000</td>
<td>Melissen, Govt Haiti*</td>
</tr>
<tr>
<td>5</td>
<td>Great Kanto</td>
<td>Japan</td>
<td>01.09.1923</td>
<td>142831</td>
<td>142800-143000</td>
<td>Scawthorn et al. 2005</td>
</tr>
<tr>
<td>6</td>
<td>Ashgabad</td>
<td>Turkmenistan</td>
<td>05.10.1948</td>
<td>122000</td>
<td>110000-176000</td>
<td>CATDAT</td>
</tr>
<tr>
<td>7</td>
<td>Sichuan</td>
<td>China</td>
<td>12.05.2008</td>
<td>88287</td>
<td>87476-89000</td>
<td>Govt.</td>
</tr>
<tr>
<td>8</td>
<td>Kashmir</td>
<td>Pakistan etc</td>
<td>08.10.2005</td>
<td>87364</td>
<td>73338-87364</td>
<td>ReliefWeb</td>
</tr>
<tr>
<td>9</td>
<td>Messina</td>
<td>Italy</td>
<td>28.12.1908</td>
<td>85926</td>
<td>80000-90000</td>
<td>CATDAT</td>
</tr>
<tr>
<td>10</td>
<td>Ancash</td>
<td>Peru</td>
<td>31.05.1970</td>
<td>66794</td>
<td>52000-96794</td>
<td>CATDAT</td>
</tr>
</tbody>
</table>

*subject to further confirmation from a non-government source due to Corruption Perceptions Index value.

Daniell (2011)

### % of Country's Population at Risk

<table>
<thead>
<tr>
<th>City</th>
<th>Population (millions)</th>
<th>Estimated deaths (thousands)</th>
<th>Estimated Injuries (thousands)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Almaty</td>
<td>1.5</td>
<td>75</td>
<td>300</td>
</tr>
<tr>
<td>Ashkabad</td>
<td>0.7</td>
<td>35</td>
<td>140</td>
</tr>
<tr>
<td>Bishkek</td>
<td>0.8 (now ~1)</td>
<td>40</td>
<td>160</td>
</tr>
<tr>
<td>Dushanbe</td>
<td>0.6 (now ~1)</td>
<td>30</td>
<td>120</td>
</tr>
<tr>
<td>Tashkent</td>
<td>2.7 (now &gt;3)</td>
<td>135</td>
<td>540</td>
</tr>
</tbody>
</table>

GeoHazards  B.Tucker, pers. comm.
The recent largest earthquake occurred in 2008 in Nura (M=6.6)

Deformation made by waves after the earthquake

Splits after the earthquake
NATO ANW “Advanced cooperation in the area of disaster prevention for human security in Central Asia”, Dushanbe, May 16-18, 2011

NATO-country Co-director: István Tétényi,
Partner-country Co-director: Askar Kutanov
Seismic Early Warning / Rapid Response

• In the framework of ACROSS, GFZ develops monitoring system for (regional) Seismic Early Warning/Rapid Response (starting from 2014). It is planned to install about 50 stations and two vertical arrays.

• To fulfill the ACROSS requirements:
  - Develop of a monitoring system that can be generalized and exported to other “hazards”
  - Define (or implement) standards for data acquisition/archive/exchange

ACROSS and GEMIS will benefit from as well as contribute to the European research infrastructure initiative European Plate Observing System (EPOS).
Environmental monitoring

Smart Station ENEL
(Enylchek)
Concept of the CAIAG Information - Communication System

CAREN and Internet
Central Asian Geodata Base Infrastructure

Central Asia Geodata Base Infrastructure

- Local Authorities Administration
- National Surveying & Mapping Agencies
- National Establishments Emergency Situations
- International Partners

Non-Govermental Organisations

National Hydro-Meteo Service

Institutes of NAoS and Universities

National Geological Services

Environment ext.
- Precipitation
- Temperature
- Land Use
- Vegetation
- Water / Snow

Environment int.
- Radioactivity
- Geol. Ressources

Socio Demography
- Population
- Occupation
- Age Pattern
- Education Level
- Poverty Level

Geo-Map Data
- Topographic Maps
- Digital Elevation Model
- Ortho-Images
- Thematic Maps
- Strain / Stress Maps
- Reference System Data

Infrastructre
- Energy Supplier
- Railway / Road System
- Water / Wastewater
- Sas / Oil Pipelines

Geosciences
- Gravimetry
- Hydrology
- Glaciology
- Seismology
- Engineer. Geology
- Climatology
- 3D Geodetic Positioning
- Drilling

Protectorates
- Nature Reserves
- National Parks
- Biosphere Reserve
CAREN NOC detected hacker attack to CAIAG’s server on 2012/02/04
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Australia</td>
<td>1</td>
<td>CSIRO Office of Space Science and Applications (COSMA)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td>2</td>
<td>GeoScience Australia (GA)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td>3</td>
<td>Australian Bureau of Meteorology</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Bangladesh</td>
<td>4</td>
<td>Bangladesh Space Research and remote Sensing Organization (BFARRSO)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Korea</td>
<td>21</td>
<td>Korea Aerospace Research Institute (KARI)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Kyrgyz</td>
<td>22</td>
<td>Central Asian Institute of Applied Geosciences (CAIAG)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Lao P.D.R.</td>
<td>23</td>
<td>Ministry of Labor and Social Welfare</td>
<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Malaysia</td>
<td>24</td>
<td>Water Resources and Environment Administration (WREA), Prime Minister Office (PMO)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>Mongolia</td>
<td>25</td>
<td>National Security Division, Prime Minister’s Department</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>26</td>
<td>Malaysian Remote Sensing Agency</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>27</td>
<td>National Remote Sensing Center of Mongolia (NRSC)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Objective: The workshop aims at an introduction to remote sensing and GIS for analyzing glacier retreat and assessing the geohazard potential of retreating glaciers in the Ala Archa region.

Aim: Participants are able to start and complete a short GIS project and to interpret remote sensing data using ERDASIMAGINE software. Teams of 2-3 participants finalize a report on Adegyne-field work using GIS & RS equipment. Presentation of results by each team on last day of workshop.
• Кенул бурганыгызга чоң рахмат!
• Thank you for your attention!

• director@it.kg