

Tbilisi Earthquake -2002


Flooding - involving Arsenic containing waste- 2013

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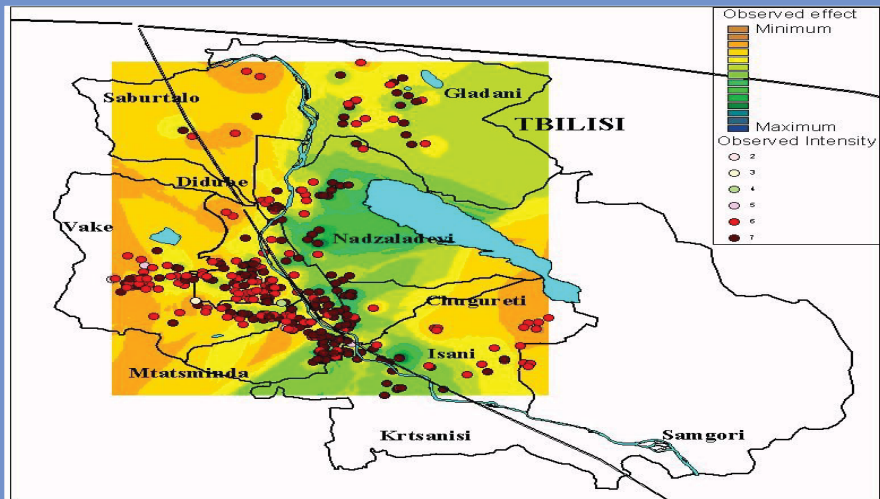
General conditions

- **Tbilisi** is the capital of Georgia was built in fifth century.
- It is situated on the both sides of Kura river, in intermountain depression between the Greater and Lesser Caucasus and covers the area of 350 square kilometers.
- **Population** -1 .4 mln.(about ¼ of population of whole country)
- **annual growth rate** of population - 1.3%.



Tbilisi earthquake - 25.04.2002 at 22:41(local time)

- earthquake with $M=4.5-4.7$.
- Level I - 24% buildings;
- Level II - 48 % buildings;
- Level III - 27% buildings;
- Level IV - in a single instance



There were two foreshocks 14 December 2001 and 11 April 2002 before the main shock.

Results

- death – 6 people
- Injured– about 100 people;
- homeless – 673 persons;
- damage- 1735 houses;
- Incur losses- 10.159 families;
- temporally housing- 379 families
- economic loss – 360 mln. Lari (about 180 mln. US dollars)

source: Emergency Management Department – Ministry of Internal Affairs of Georgia

What was done so far?

- High quality “built environment” inventory map was developed for **some part** of the city
- Map of seismic site conditions and amplifications were constructed – 1:30 000 scale;
- seismic sources in 1:30 000 scale were constructed for Tbilisi area
- vulnerability for four type of buildings were developed
- Initial value of buildings were estimated
- seismic risk assessment and loss estimation studies for Tbilisi (Compilation of city scenario) for possible scenario earthquakes were calculated

What should be done?

- Specification of seismic sources (active faults or areas);
- Updating of probabilistic seismic hazard maps (peak acceleration, intensity, spectral acceleration) of earthquake prediction in different scales using modern methodologies
- Seismic risk mapping - considering the density of population, infrastructure exposition and vulnerability (large cities and sites of particular importance in the compilation of seismic scenarios);
- Development of insurance and reserve systems to decrease Disaster Deficit index – DDI based on seismic risk assessment



Flooding -involving Arsenic containing waste-27.09.2013

Extreme hydro-meteorological event caused flooding of the Tskhenistskali River and the change of the riverbed, which in turn caused damage to the former metallurgical plant's dam in Lentekhi and subsequent leakage of arsenic waste material stored in steel barrels on the site (Tsana 1)



Problem description

This case highlighted once again the dangerous ecological situation created in Ambrolauri and Lentekhi regions of Georgia.

After the plants producing arsenic concentrate were closed in the 90s., building of the plants were demolished and drums with arsenic waste material remain scattered around openly on the sites;

Over 100,000 tons of wastes containing arsenic are accumulated in the villages of Tsana and Uravi. The sites are located in the basin of the Tskhenistskhali and Rioni rivers and there is an existing high risk of arsenic leakage.



Actions

- initiated public discussions on the issue in collaboration with different line ministries, scientific institutions, NGOs, other experts as well as local population to develop and implement effective measures
- The importance of the matter is underlined in the National Environmental Action Program for 2012-2016
- A study of arsenic-containing ashes and sludge in villages of Tsana and Uravi has been conducted (by “Witteveen+Bos”, Dutch consultancy and engineering firm); action plan for its conservation has been developed.
- **implementation of the urgent measures, sarcophagus construction and safe disposal of arsenic containing waste materials requires additional funding for insuring the population and environmental safety in Georgia**

assistance

- on-site detailed study –Tsana (3 sites); Uravi (4 sites);
- elaboration of an action plan for safe transportation and disposal of arsenic containing waste materials;
- identification of standards and size parameters for sarcophagus construction;
- cost assessment for required activities
- sarcophagus construction – (2 sarcophagus in Tsana and 2 in Uravi -))

The mentioned above activities are of particular importance to ensure the construction start in Spring 2014.

Last Developments

- **Disaster Risk Reduction is identified as one of the priority from 2013 for the Ministry of Environment Protection and Natural Resources**
- **Adaptation to Climate Change** was acknowledged as a priority in the National Climate Change Policy in 2009 based on the results of researches conducted under Georgia's Second National Communication to the UNFCCC. National Adaptation Plan is under development and will be consolidated with the **Adaptation Strategy under the Third National Communication** to the UNFCCC.
- On 25 June 2010, the Government of Georgia adopted **State Strategy on Regional Development for 2010-2017**, which states improvement of disaster risk management as one of the key priorities of the government policy.
- **"Agricultural Development Strategy of Georgia" (2012-2022)** provides main directions of agricultural development and incorporates aspects of Disaster Risk Reduction.

Last Developments

- In 2010, the President of Georgia, by order #707, approved **Georgia's Threat Assessment Document** for 2010-2013, which lists natural and man-made disasters among other threats.
- **The National Security Concept of Georgia** (2011) was elaborated under the guidance and coordination of the Office of the National Security Council of Georgia with the participation of all relevant governmental agencies.
- **Disaster Risk Reduction is one of the three priorities** of the United Nations Development Assistance Framework (**UNDAF**) in Georgia for 2011-2015. The document includes measures to be implemented in disaster risk reduction with stakeholder participation and closely follows the Hyogo Framework for Action.
- By the decree of the Prime Minister an interagency working group on elaboration of the **Chemical, Biological, Radiological and Nuclear (CBRN) National Strategy** has been recently established.
- Ongoing development of **Spatial Planning and Construction Code** of Georgia (GIZ; Ministry of Economic and Sustainable Development)

HYOGO Framework for Action (2005-2015)-UNISDR

- **National progress report on the implementation of the Hyogo Framework for Action (2009-2011); (2011-2013)**
- Global Platform 19-23 May,2013
 - National Delegation of Georgia (MoENRP; EMD)
 - Bilateral meetings- UNISDR, UNDP, SDC, EUNP
 - CADRI-UNDP Mission 2013-2014

Thank You

Questions? Comments?