Academy of Science of the Republic of Tajikistan
Institute of geology, seismological construction and seismology

REACT, 6 June 2012:

Emergence and impact of Tavildara Earthquake on 13th of May 2012 in Tajiksitan

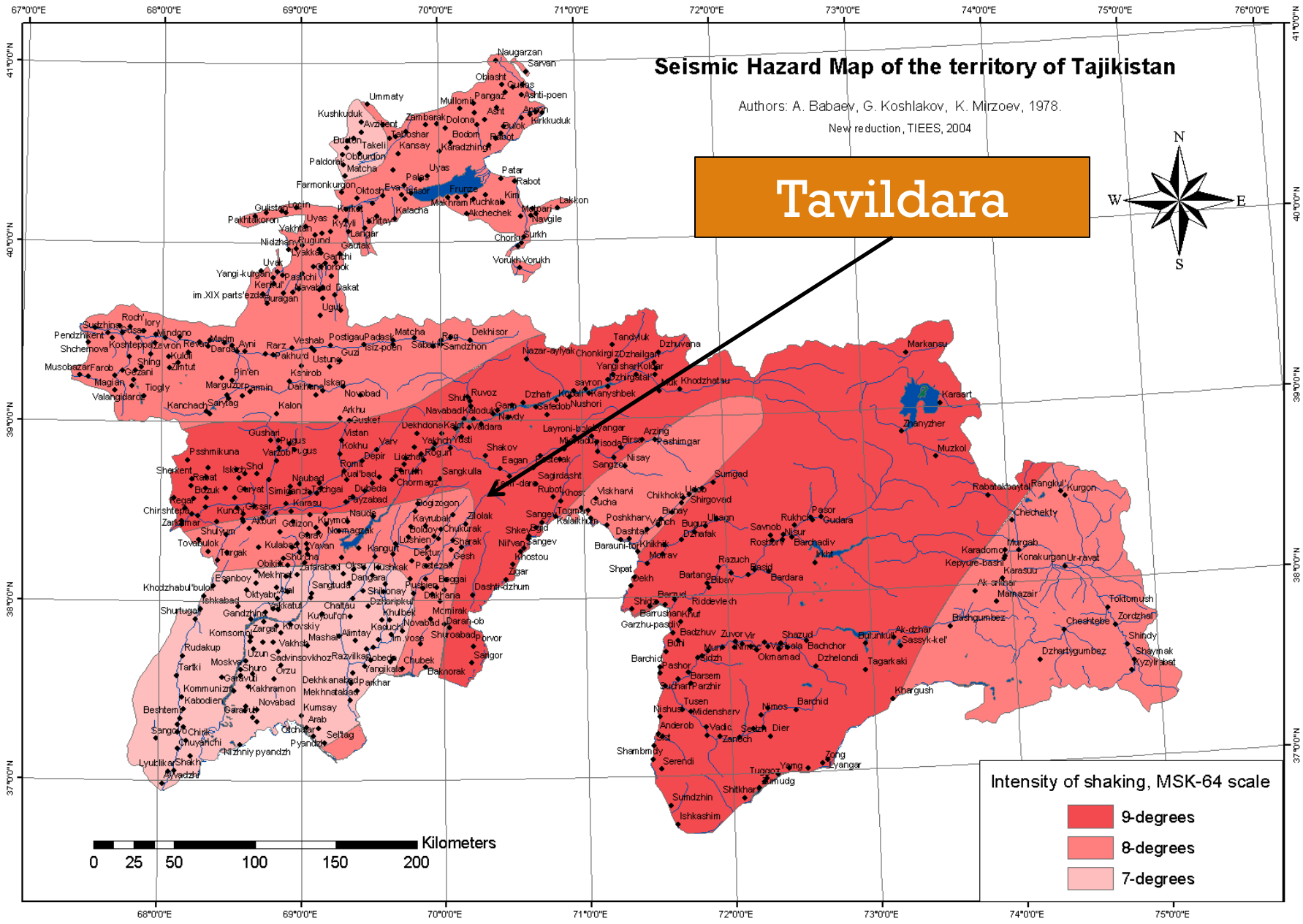
Expedition (19-23 may 2012) Mamadjanov Y.M, Juraev R. U, Olimov B. K, Murodkulov Sh. Y and Sanginov A.

Epicenter

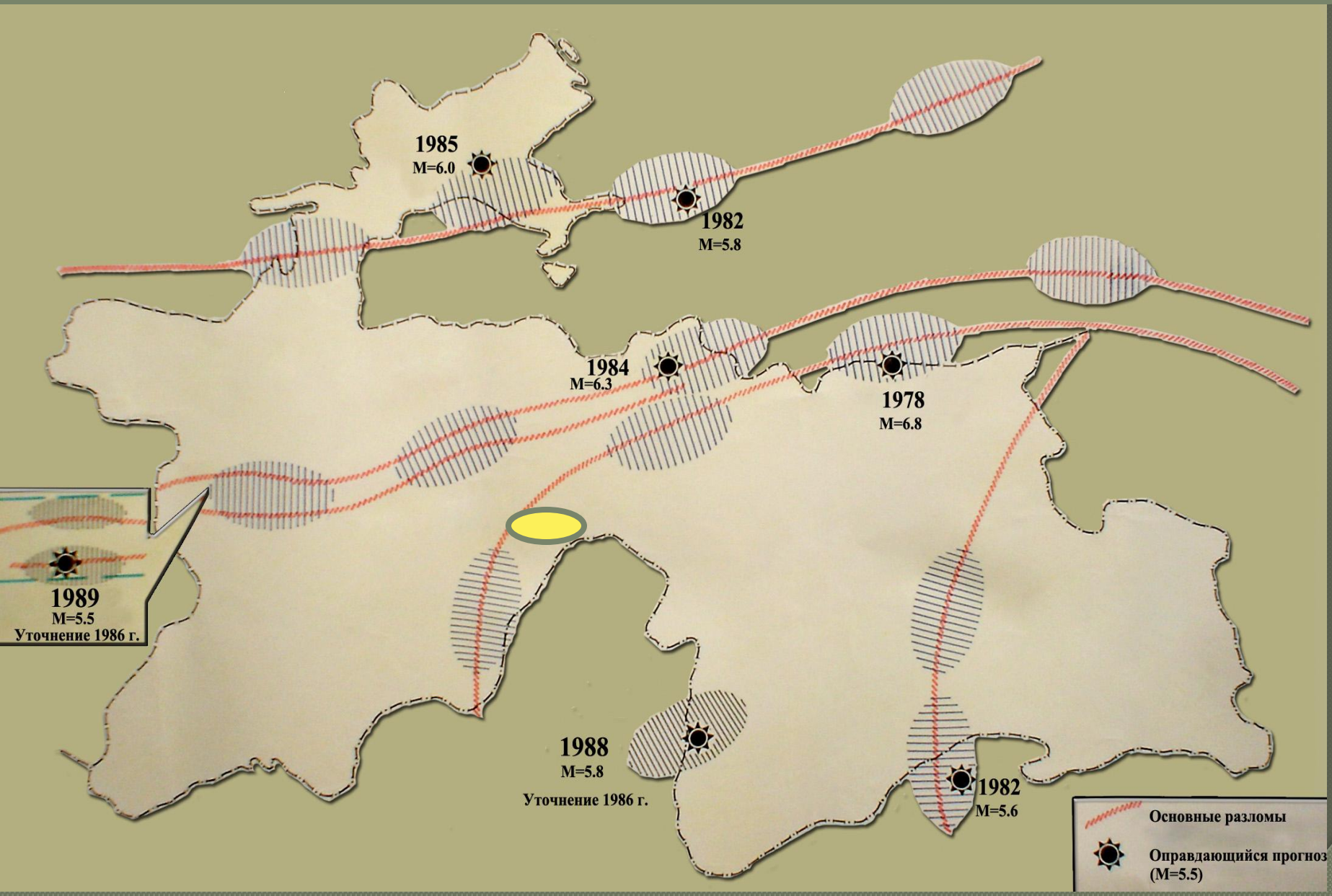
- 13 May2012
- 04 :28 minutes local time
- 10km км south-west from Tavildara
- Intensity: 6-7
- Magnitude: M= 5.7
- Coordinates: φ=38,65ºс.ш., λ=70,42º в.д.
- Power classification: К=14.6
- Depth: H=10 km

Previous earthquakes:

- Sayat earthquake in1943 – 6 баллов,
- Tavildara earthquake1950 – 7 баллов,
- Ishtiyon earthquake 1987 – 6 баллов .


Seismic Hazard Map of the territory of Tajikistan
Authors: A. Babaev, G. Koshlakov, K. Mirzoev, 1978.
New reduction, TIEES, 2004
Tavildara
N
S
W
E
Intensity of shaking, MSK-64 scale
9-degrees
8-degrees
7-degrees
Kilometers
0 25 50 100 150 200
67°0'0"E
68°0'0"E
69°0'0"E
70°0'0"E
71°0'0"E
72°0'0"E
73°0'0"E
74°0'0"E
75°0'0"E
76°0'0"E
41°0'0"N
40°0'0"N
39°0'0"N
38°0'0"N
37°0'0"N

Map
Of the areas where earthquakes might happen M >5.5.



The intensity of the earthquake (points) according to 53 settlements – scale MSK-64

Epicenter - 6-7 points – Pashor, Rubotnol, Yozgand, Khumdara, Chashmai Kabud, Girdob and Dashti Hasan:

- Sharp vertical jolt, transformed to horizontal.
- People evacuated buildings out of fear.
- Majority of houses and auxiliary buildings are damaged and shells are formed in the walls. More heavy are damaged old buildings constructed from stone with inappropriate quality of clay. Less damage has been caused to buildings constructed from clay only. The majority of houses are damaged to a degree that they are not suitable for stay any longer.
- Avalanches and landslide, cracks in the soil on the slopes.

6 points – Shuri Poyon, Garibon, Safedkhok, Dehi Bolo, Childara, Khodjai Ikhlos, Langar (Nurabad district)

- Similar damage – with lower degree. Total damage is observed in some buildings constructed from stone. The majority of buildings damaged by cracks on the walls in the corners, and light cracks on the walls with damage of plaster.
- In Langar village of Nurabad district, located 20 km from the epicenter, the impact of earthquke increased due to soil and hydro geological conditions of the area. (increased level of underground water).

Intensity 5-6 points

- Komsomolobod – 5
- Kaftarguzar – 5-6
- Yofuch - 5-6
- Dashtigurg - 5-6
- Norinj - 5-6
- Tagiboqja - 5-6
- Khumdon -5-6
- Shahrisabz -5-6
- Istiqlol- 5-6
- Amirbek -5-6
- Shulonak -5-6
- Kalai Surkh -5-6
- Rasht - 5-6
- Gharm - 5
- Hazorchashma - 6
- Bulkos - 6
- Darband- 5-6
- Saripul - 5-6
- Pandovji -5-6

In zones of 5-6 magnitudes, in Kalai Surkh landslide damaged 3 houses with auxiliary buildings. Live stock of owners was killed under the buildings.

In Pandovji village of Nurabad district as the result of damage of old building of a warehouse a person was killed trying to escape his house. The house was not damaged too badly.

Intensity 4-5 points

- Sagridasht - 4-5
- Rogun - 4-5
- Obigarm - 4-5
- Tojikobod - 4
- Hoit - 4
- Kamarov - 4-5
- Jirgatol – 3-4
- Faizobod - 4
- Vahdat – 4
- Norak - 4-5
- Kalaikhum - 3-4
- Dushanbe - 4

Impact of the earthquake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Damage of buildigs in the epicenter zone

- Majority of houses, administrative and public buildings are constructed from broken stone, using mud clay and very rarely bricks have been used.
- The majority of houses do not have foundation.
- Basic methods of reinforcements are not used.
- Weak connection between stones and mud clay can not provide seismic resistance.
- With such construction methods even an earthquake of a smaller magnitude can cause emergence of cracks in the walls.

Conclusions

- **Seismic risk in the territory of Tajikistan are very high, and earthquake of even higher magnitude will happen in comparison to the earthquake on 13 May 2012 in Tavildara.**

- **It is necessary:**
  - **To follow the strict rules of seismic resilient construction.**
  - **Improvement of seismic safe methods, using local construction materials.**
  - **Conducting assessment and provision of maps of seismic risk**
  - **Provision of trainings on seismic safe construction to population.**
  - **Trainings on methods of protection from an earthquake.**
  - **Improvement of legislation of RT on seismic safety of population and territory.**