International Journal of Geology, Earth & Environmental Sciences ISSN: 2277-2081
An Open Access, Online International Journal Available at http://www.cibtech.org/jgee.htm
2024 Vol. 14, pp. 143-147/Fazliddinova and Utamurodova
Research Article

SEISMOTECTONIC ACTIVITIES OF CHOTKOL-KURAMA AREA

[1]Fazliddinova Madinabanu Zakhritdinovna* and [2]Utamurodova Vazira Sharif's daughter
[1]National University of Uzbekistan named after Mirzo Ulugbek,
Department of Geology and Engineering Geology
[2]National University of Uzbekistan named after Mirzo Ulugbek,
Department of Geodynamics and Tectonics
**Author for Correspondence: Madinabonufazliddinova95@gmail.com*

ABSTRACT
The Chotkol-Kurama region is distinguished by its tectonic complexity and is considered to be a region where relatively many earthquakes occur. Earthquakes that occurred in the region are reflected in the cosmic image based on their magnitudes. The seismogenic movements of the Chotkol-Kurama region are described.

Keywords: *Earthquake, Magnitude, Seismotectonic Movements, Seismodilocation, Earth Cracks*

INTRODUCTION

Nowadays, in the age of technology, space methods and other elements of modern technologies are developing, and the demand for using these methods in the field of geology is increasing. In the field of geology, space images are used to solve many problems. Including, it is possible to express the location and magnitudes of regional earthquakes. As a result, we can have information about the seismotectonic condition of the area based on earthquakes. Seismotectonics is an important field of geology, which helps to understand the dynamics of the Earth and to predict possible risks associated with tectonic processes. Chotkal-Kurama region is considered one of the seismically active regions of our country. The Chotkal - Kurama region is tectonically distinguished by its complexity , tectonic faults and modern tectonics are evidence of the fact that they are periodically renewed in the relief and at different stages of the development of the crust of the region .

Chotkal-Kurama region is divided into Chotkal (northern) and Kurama (southern) zones according to the structural condition and structural characteristics of the rocks. The Kurama zone occupies the southwestern part of the middle Tien-Shan (V.I.Popov, 1938). The open part of the Chotkal-Kurama region occupies the southwestern part of the Karjontov, Kurama mountain ranges, the Mogultog mountains and the Chotkal mountain range, and includes some parts of the territories of four republics - Uzbekistan, Kazakhstan, Kyrgyzstan and Tajikistan. From the north-eastern side, the territory is adjacent to the Chotkal structural-formation zone, and from the south it is limited by the Southern Tien-Shan mountain ranges.

Nanay in the southeast . It consists of echelon-shaped - parallel - northeastern linear ridges, connected in places by high mountain or plateau-like bridges, and separated by closed or open intermountain depressions to the southwest. (Khodjaev, 1985).

Chotkal-Kurama mountain system is the western extension of Tian -Shan, it consists of Karjantog, Ugam, Piskom, Chotkal and Kurama ridges, which are almost parallel to each other. The highest point here is Sayram peak at Ugam, 4236 m above sea level.

Geological and seismological conditions are of great importance in the assessment of seismic risk . Faults, whose modern seismic activity is studied in detail, are characterized by a set of geological and geophysical parameters that confirm their tectonic activity in the latest, Quaternary and modern stages of development. Talas - Fergana (1 2) The right lateral fault - strike-slip fault delimits areas (Western and Central Tien Shan) with different recent and modern geodynamic regimes. In general, it is represented by a fault-slip fault extending along the Fergana, Atoynaq and Talas uplifts. Parallel to the fault line, many cracks with a width

of 1-3 km can be observed. The width of the shear fault zone is from 8-10 km to 15 km. The rise of the Talas-Fergana faults in the Chotkal-Kurama zone to the dynamic influence zone is characteristic. Displacements of young landforms are found along the entire length of the fault. In the current period, the displacement rate is less than 2 mm per year, in the Holocene it is 12 mm/year, and in the late Cenozoic it is 12-20 mm/year. The occurrence of the Chotkal earthquake in 1946 is related to the activity of this fault. and the Talas and Karakulja paleoseismic dislocations found here have a maximum vibration strength of 9 points

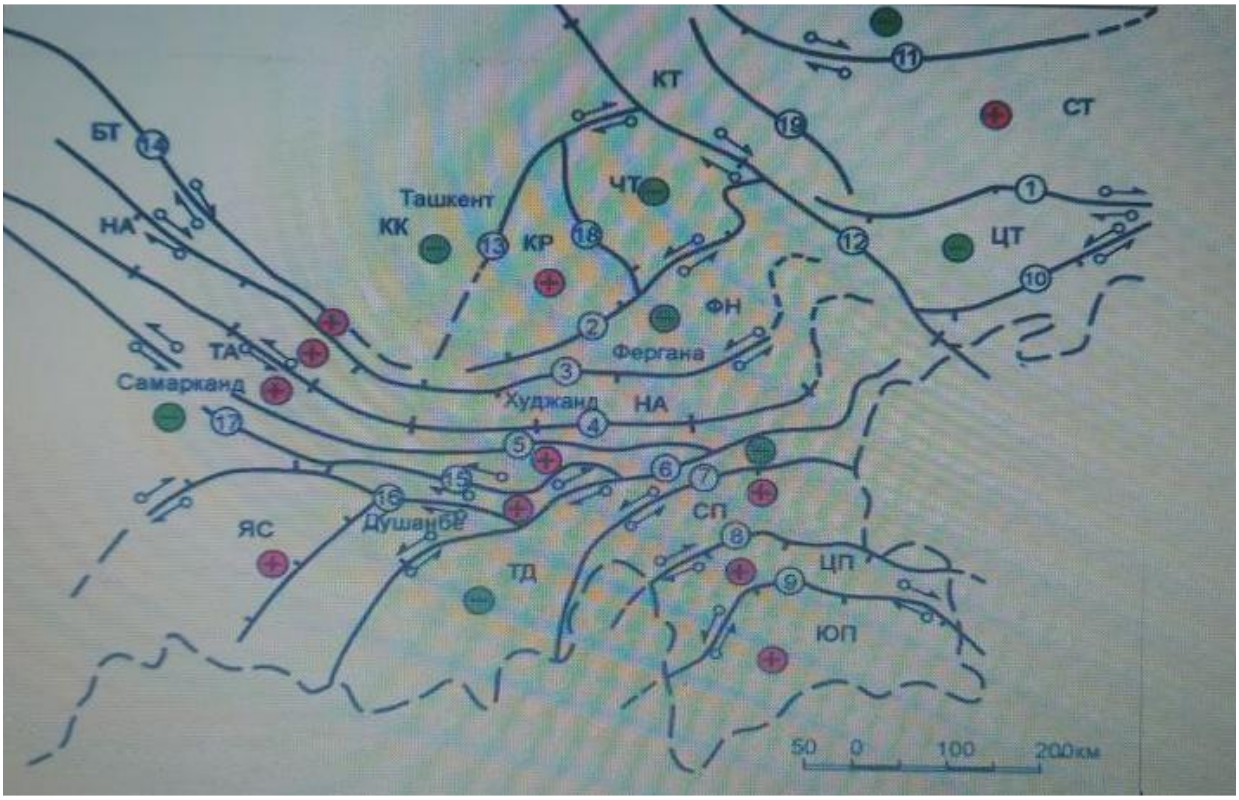

Fig. 1. Laying of Pamir and Tien-Shan deep earth faults (based on data of Sh.D. Fatkhullaev, 1973.) Earth fault: 1- Tian-Shan, 2- Northern Fergana, 3- Southern Fergana, 4- Turkestan, 5- Vakhsh, 6- Kizilsoy (Surkhantog), 7- Korakol, 8- Akbaytal, 9- Southern Pamir, 10- Atabash, 11- Northern Tyan-Shan, 12- Talas-Fergana 13- Northern Chotkol 14- Kizilkum 15- Northern Hisor 17- Southern Zarafshan 18- Kumbel-Arashan 19- Ichkeltog

Northern Fergana Fault (2). It is a tectonic border between Chotkal-Kurama and Fergana regions. The fault zone has a complex structure and consists of a large number of en-echelon faults, among which there are brachyanticlinal folds up to 30 - 40 km long and up to 10 km wide. In the southwestern part, the amplitude of Neogene-Quaternary movements reaches 4.5 km, increases in the northeast direction, and reaches 6 km in the middle part of the fault. Pre-Mesozoic sediments along the fault are overlain by the Cenozoic filling of the Fergana Deep. the average inclination is 45-50 degrees. According to some indications, horizontal movements of the left-slip type occurred along the fault. Recorded mainly with geological and geophysical data sets. High values of the heat flow gradient are observed in the crack zone. Average values of modern vertical movements reach 5 mm per year. Sources of 7-8 magnitude earthquakes are associated with it
Southern Fergana (3) is much higher than the fault zone. The most important earthquake in the studied period occurred in 1984 in the settlement of Pap. The maximum strength of earthquakes in this earthquake

reached M=5.5. Reactivation of the Namangan earthquake zone is observed. A number of strong earthquakes were
also recorded in the dynamic influence zone of the Southern Fergana tilt-fault zone. The first strong earthquake in the zone was M=6.2 in 1823. The next, stronger earthquakes occurred in 1902 (M=6.4 in Andijan) and 1903 (Maksad M=6.4). At the epicenter, these earthquakes were 9 and 8 intensities, respectively. In addition to these earthquakes, more than 9 earthquakes of M≥5.0 occurred in the dynamic influence zone of the Southern Fergana tilt-fault dislocation during 120 years. All these earthquakes occurred with an intensity of 6-7 and higher. The characteristics of weak earthquakes are also interesting. Compared to the concentration of weak earthquakes, activation of focal zones of Pap 1984, Andijon 1902 and Maqsad 1903 earthquakes is observed.
He conducted aerial photogeological research in the geological interpretation of space images within the studied area (E.V. Panchenko, B.T. Aleyshin, 1978; T.Sh. Shayakubov, Yu.S. Glinskiy, 1984) and aerial photogeological imaging in geological imaging. The results of scientific and practical studies of researchers who used the data (F.G. Gulamov, S.N. Zadorina, 1975; V.D. Lyashkevich, 1988, 1992, V.N. Tkachev, 2004) were taken into account. -42- The first geological map on a scale of 1:200,000 was compiled in 1961 for the research area corresponding to the XXIX nomenclature sheet. T.Sh.Shayakubov, Yu.S.Glinskiy et al., (1984) on the decoding of the results of aerospace research on the Chotkal-Kurama area created a single cosmostructural map as a result of the work done on a scale of 1:100,000. As a result, the geological structure of the area was determined, and based on the results of the interpretation of the materials of aerospace research, the main laws of the distribution of the main types of minerals in the Upper Paleozoic orogenic structures were determined.
Occurred in the Chotkol-Kurama region were analyzed. Based on the catalog of earthquakes, the magnitude values of the earthquakes that occurred in the region were displayed in a space image . (Fig. 2.) Most of the strong and destructive earthquakes are associated with cracks in the earth's crust. The complex of seismotectonic analyzes also includes the study of the results of macroseismic description of exodynamic phenomena (seismic dislocations) detected after strong earthquakes (M ≥5; I_o ≥7 points) .
It is known that significant changes occur in the relief of the Pleistocene region during strong earthquakes, from which the movement mechanism at the source of the earthquake can be estimated. These changes are recorded as seismotectonic and seismogravitational dislocations, usually formed along active faults. In addition, the stronger the shock intensity, the more diverse are the types of seismotectonic dislocations. They are especially evident in mountainous and sub-mountainous
regions. According to the time of manifestation, seismotectonic dislocations are divided into modern and historical, as well as prehistoric (paloseismic dislocations).
The Andijan earthquake that occurred on December 3, 1902 (9 points) in Andijan, especially in the hilly area, caused geomorphological changes on the Earth's surface. Many seismic dislocations appeared in the form of faults and landslides. The general direction of seismic dislocations is controlled by the South Fergana flexural zone. Separate cracks stretch for several hundred meters, their width in some places exceeds 30-35 cm. Fountains of sand and stones were observed in some places.
The Chotkal earthquake occurred on November 3, 1946, the intensity was 9-10 points, the average depth of the hypocenter was estimated as 25 km. As a result of the earthquake, there were many dislocations represented by the displacement of the flanks of the faults, the formation of faults, the failure of the slope and bedrock formation, as well as landslides.
Markai earthquake August 3, 1962 (8 points). Local (S=100 km²) appeared. Residual deformations are most developed in the river valley. Changetsu. Large landslides occurred here, the collapse of individual blocks was recorded at a distance of 2-2.5 km. The largest seismic dislocation was established on the left bank of the river.

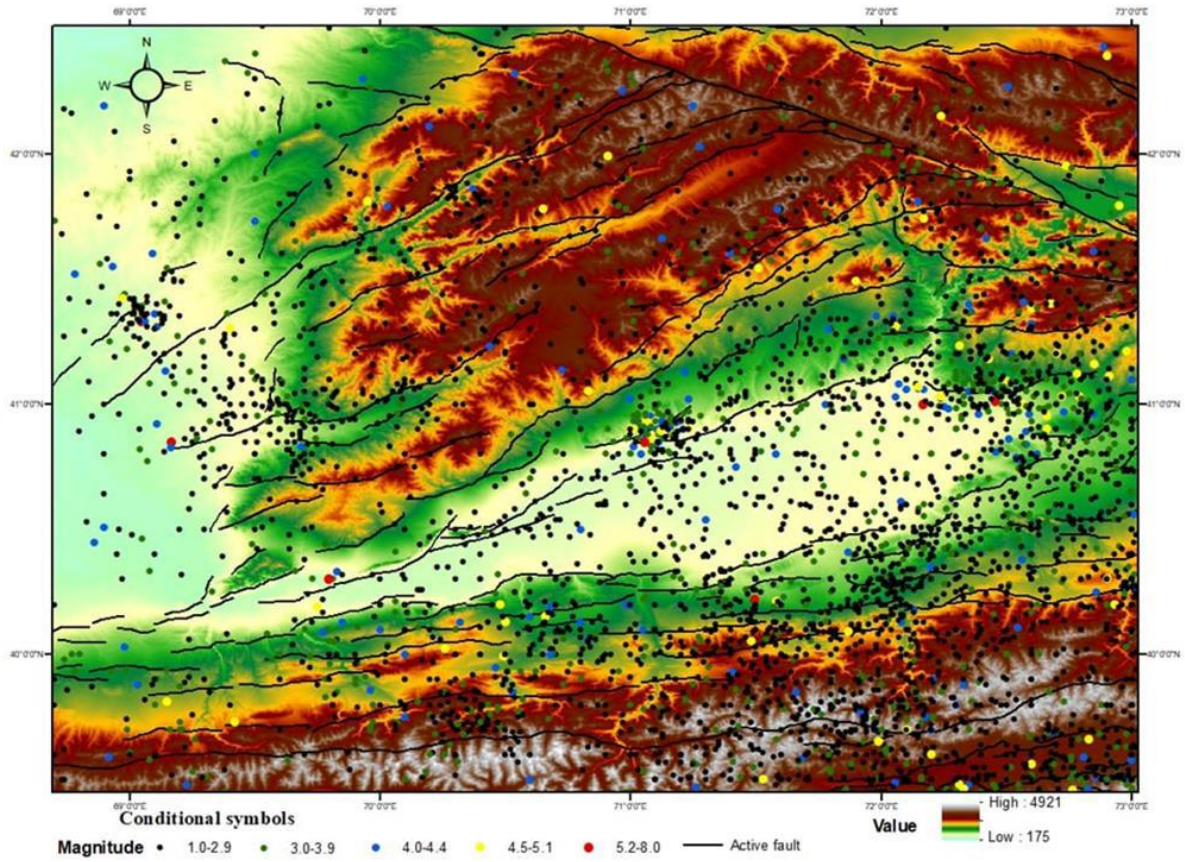

Fig. 2. Scattered earthquakes in Chotkol-Kurama region

Changetsu. During the earthquake, a small-amplitude circus-shaped crack was formed here with the displacement of its wings by 1.5 - 2 m, and a line of cracks with a length of up to 2.5 km was established on the Earth's surface. there are several springs. Apparently, the rupture that occurred during the earthquake affected the aquifer, and the aquifer began to migrate along the fault line. The strike of the fault is southwest. Brichmulla Earthquake October 24, 1959 The Pleistocene zone of the earthquake extends in the northeast direction, its length is about 25 km and its width does not exceed 15 km. In this case, the compressive stresses of the meridional direction also acted.

The Pleistocene area of the Tashkent earthquake of April 26, 1966 had an oval shape of 10 square meters. km, 7, 6, and 5 earthquake zones had an ellipsoidal shape extending from northeast to southwest.

Pskent earthquake, January 19, 1970, 6-point Isoseim extended 80 km from the southwest to the northeast. The Tavaksai earthquake occurred on December 6, 1977. In the Pleistocene zone, it was recorded that the cracks of the plaster in the houses, the damage of the chimneys and the collapse. Six points Isozeoist stretched in the northeast direction.

The Nazarbek earthquake occurred on December 11, 1980. According to macroseismic research, the intensity at the epicenter reached 7-8 points. The planar isoseisms are oval in shape with a northeast strike. The Pop earthquake of February 17, 1984. The epicenter of the earthquake was located in the territory of the village of Uygursoy, and it was bordered by the Northern Fergana tilting zone. In the center of the earthquake, the strength of the earthquake reached 8 points. structurally, the area where the Pop earthquake occurred belongs to the Northern folds zone of the Fergana lowland. It is located between the North Fergana Fault and the eponymous flexural zone, extending from northeast to southwest and covering the foothills of the Kurama Range. A sharp change in the thickness of the Neogene-Quaternary deposits within the

Northern Fergana bending zone indicates the renewal of the earth's faults in the Upper Pliocene-Quaternary period. Most surface anticlines have moved 200-500 m or more relative to their roots. Shifting of the fold axes is especially evident between the Upper Pliocene-Middle Oligocene and Upper Oligocene-Middle Pliocene deposits.

To date, many methods of seismic risk assessment have been developed, the most important of which are tectonophysical (Gzovsky, 1959; etc.), seismotectonic
(Gubin, 1966; etc.), quantitative (Petrushevsky, 1959; etc.), geological - geophysical combination (Borisov, Shenkareva, 1972), paleoseismogeological (Florensov, 1960; Solonenko, 1962), in 1985, A.K. Khodzhaev studied the paleoseismogeology of the Chotkal-Kurama region, which gained importance due to the creation of seismotectonic maps of the region.

REFERENCES

Anonymous (1986). Pope earthquake, 1984. *Tashkent and USSR SCIENCE building*. *F A N ,* 23

Arapov VA (1983). Volcanism and tectonics in the Chatkalo-Kurama region. *Tashkent, FAN*. 255.

Babaev AM (1989). Major Faults in Tajikistan and Their Systematics**.** *Geology and Geophysics of Tajikistan (Donish, Dushanbe).*

Fazliddinova MZ (2022). Glubinnye razlomy po regmaticheskoy seti Chatkalo-Kuraminskogo region i ix svyaz s seismichnosti. Current problems of education and science in aviation and space technologies. *International scientific and technical conference* // *Collection of conference reports*. *Tashkent*. 666. Pages 453-463.

Gorshkov GP (1949). Soviet Union in the area Earthquakes M., Geograf Publishing House. Literature,

Ibragimov RN (1978). Medium of Tien-Shan seismogenic zones *Tashkent, FAN* 144 p.9

Kats YaG, Poletaev AI, Rumyantseva EF (1986). Basic lineament tectonics. - M.: Nedra. 140p.

Khodjaev AK (1983). Paleoseismogeology in the Chatkalo-Kurama region, *Tashkent, FAN*,

Nazarbek (1984). Earthquake on December 11 , 1980 Tashkent , Iz-vo *FAN UzSSR*, 145 p

Radabov S *et al.* (2012). are Meso-Cenozoic Ferghana of depth geological development about new thoughts *NUUZ newsletter.* 2/1, 86-88.

Suvorov AI (1954). Ferghana Genetically tectonic zoning of the depression characters . *Sciences of the USSR Institute of Geology of the Academy Materials,* No. 158. M. 18

Tal-Virsky BB (1998). Geophysical fields, deep structure of the earth's crust and mantle, seismicity and modern movements. 369-427. *"Geology and mineral resources of the Republic of Uzbekistan", Tashkent, University*.

Ulomov VI (1974). The dynamics of the Earth's crust in Central Asia and the prediction of the Earthquake. Tashkent, Izd-vo "*Fan" UzSSR*.