IWRM2018-22
8th International Water Resources Management Conference of ICWRS

The Pamir Mountains climatic zones in conditions of modern global climate change and their contribution to the water resources of the Transboundary Pyanj River

Inom Normatov, Parviz Normatov, Bakhtiyor Markaev, and Gulandom Norkulova

Institute of Water problems, ydropower and Ecology AS Republic of Tajikistan, Water resources management, Dusanbe, Tajikistan (normatov58@mail.ru)

The Mountain Pamir as watershed of the Transboundary Pyanj River in the concept of climatic zoning is considered as an area where carry out a change of wet and cold Mediterranean air mass to dry Central Asian. The monitoring of meteorological conditions and dynamics of their changes in conditions of global warming is an urgent problem because of essential improve to the development of river water discharge.
In addition, the importance of the Pyanj River for the economy not only Tajikistan and Afghanistan, but also for the downstream countries of the Transboundary Amu Darya (Uzbekistan and Turkmenistan) is indisputable.
Now in the Pyanj river basin is operated Namangutskaya Hydropower station (HPS) by capacity of 2.5 MWt and productivity of 0.018 TWt•h/year. However, the total hydropower potential of the Pyanj river basin is 18322.5 MWt of more than 15 HPS by the production of 84.92 TWt•h/year of electricity and reservoirs by usable volume of 17.36 km3. Pyanj River is one of the tributaries of Transboundary Amu Darya in Central Asia with the length of 921 km and a basin area of 114,000 km2. The total area of glaciation of the basin is 3767 km2 and average water discharge is about 1032 m3/sec.
The basins of the main tributaries the Pyanj and Vakhsh rivers of the Transboundary Amudarya river in depending on weather conditions and orography is divided to the following zone: The Southern zone and the Pamir-Alay; Western Pamir; Central Pamir; Eastern Pamir
This article is devoted to the study of meteorological characteristics, the snow cover of the four zones of the Pamirs in terms of establishing the contribution of each zone in the formation of the water flow of the Pyanj River. The mean annual precipitation and temperature, measured at the meteorological stations Darvaz, Khorog, Irkht, Murgab and Fedchenko shows that the South-West, West and East climatic zones of the Pamirs are characterized by a decreasing trend in atmospheric precipitation as the height of the location above sea level increases. Nevertheless, such a dependence of atmospheric precipitation on the altitude for Fedchenko stations has the opposite character, i.e. the central climatic zone of the Pamir is characterized by abundant atmospheric precipitation. About this is also evidence the maximum annual average values of the snow cover on the Fedchenko glacier. Favorable temperature condition for the formation of snow cover on the Fedchenko glacier in the presence of abundant precipitation contributes to the increase in the height of the snow cover. The positive values of average annual temperatures in the southwestern and western climatic zones, despite the sufficiency of atmospheric precipitation, do not allow for the formation of thick layer of snow cover.