

Melting glaciers in Central Asia

Overview by Bo Libert, 29 October 2020

Climate change is contributing to considerable changes with regard to how much water is found in glaciers in Central Asia. It is particularly in the upstream countries Kyrgyzstan and Tajikistan that glaciers are found. In the high mountains of Tien Shan and Pamir ice and snow can accumulate and form glaciers.

The two main river systems in Central Asia, the Syrdarya and Amudarya draining into the Aral Sea, and the Ili River draining into Lake Balkhash, are highly dependent on the seasonal melting of snow and glaciers, with little additional precipitation in the lower reaches of the rivers. 50% or even more of the water in Amudarya is said to be coming from runoff of the mountains.

From studies of the size of major glaciers it can be concluded that they have been melting the past 40 years or so. It is estimated that 27% of total ice have melted in the Tien Shan mountain range. In Tajikistan some 1000 of totally 13,000 glaciers have disappeared. In different parts of Kyrgyzstan, the number of glaciers has decreased by 11-26% during the past 30 years.

The main cause is climate change. Warmer temperatures and decreased snow volumes change the balance of glacier melting and growth. This is intensified by pollution of glaciers by dust carried by storms from surrounding deserts including the drained Aral Sea bed. (Over 1 million ton of salt and sand is annually carried by wind from the dry bed of the Aral Sea.) Deposition of dust on the glaciers changes snow and ice reflectance, increases the amount of absorbed solar energy, and accelerates the melting process.

As a consequence, more water melt and flow into the Amu Darya and Syr Darya, and other rivers. The peak flow for Syrdarya is estimated to about the year 2050. At that time half of the mass of glaciers in the Tien Shan mountains (the main source of the river) may have disappeared.

Less water in glaciers also changes the seasonal water flow as there is less water coming from the mountains later in the summer when the ice is melting. As a consequence, there is less water available for irrigation in mid- and late summer.

Related to the melting of the glaciers is also an increased risk of so called GLOFS, glacier lake outburst floods, that may lead to significant damage downstream.

There are several projects on-going aiming to define the effects, improve monitoring and define how to decrease the vulnerability of the population and economy to the expected changes. UNESCO is managing a GEF project and the UN Regional Centre for Preventive Diplomacy for Central Asia in Ashgabad has some on-going related activities. Tajikistan has proposed to establish an International Fund to Protect Glaciers. In 2020 the UNESCO Central Asian Glaciological Center was established in Almaty.

For more information and illustrations of the glacier situation in Central Asia see

<https://www.shareweb.ch/site/Climate-Change-and-Environment/Documents/NexusBrief-Cryosphere-ENG-22Oct2019.pdf>