Scientific Summary No 140 related to IUFRO News 8/9 2016

Ecosystem Services and Natural Hazards of Mountain Forests in Central Asia

Report by John Stanturf, Coordinator of IUFRO Research Group 1.06.00 (Restoration of degraded sites); Deputy Coordinator, Task Force Forest Adaptation and Restoration under Global Change http://www.iufro.org/science/divisions/division-1/10000/10600/

An International Expert Workshop on Ecosystem Services and Natural Hazards of Mountain Forests in Central Asia took place on 18–22 July 2016 in Kapriz Center, Baktuu – Dolonotu, Kyrgyz Republic. This was the third IUFRO Research Group meeting held in Central Asia after Ulaanbaatar, Mongolia in 2014 and Bishkek, Kyrgyzstan in 2015. The workshop, which was hosted by the Forest Research Institute of National Academy of Sciences of the Kyrgyz Republic and sponsored by Korea Forest Service and US Forest Service, gathered 40 participants from 9 countries: Kyrgyzstan, Tajikistan, Kazakhstan, Uzbekistan, Mongolia, Russia, Australia, China, USA.

Mountain forests in Central Asia provide critical provisioning, regulating, supporting, and cultural ecosystem services (ES). Investigations of the ES benefits of forests in the region include numerical weather modeling to evaluate the services of forested watershed. Other research is underway in the walnut and spruce forests. An Ecological and Economic Accounting System is under development for monitoring global policy frameworks and incorporating the value of ecosystem services into national GDP accounting. A preliminary assessment showed an increase in the share of the forest sector in GDP in the Kyrgyz Republic from 0.05% to 1.24%.

All major rivers in Central Asia originate in the mountains and all are trans-boundary. The importance of mountain water resources are amplified in dry regions with large populations such as Central Asia. For example, between the foothills and deserts irrigated oases are home to the bulk of Uzbekistan‘s population. Irrigated arable land occupies only 3.5-4.0 million ha, but these lands are critical and directly dependent on river flow from the mountains. One of the measures to stabilize this ecosystem is the creation of protective forest stands on irrigated land, the basis of a system of interconnected forest shelter belts.

Central Asian countries are exposed and vulnerable to natural hazards, natural processes that affect people and property and cause damages and fatalities. Mass movements are often triggered by earthquakes but there are many other natural hazards in the region. The greatest threat to human lives, vital infrastructure, and settlements are earthquakes, landslides, mudflows and floods, avalanches, and glacial lake outburst floods (GLOF). The population exposed to seismic-related hazards ranges from 30% (Kazakhstan) to 100% (Kyrgyzstan). New methods are needed to anticipate, forecast, and warn people of future threats, risks and hazards. A comprehensive and systematic approach must be implemented.

Glacial meltwater influences volume, timing, and consistency of water flows to lowlands. Glacial melt accounts only for 8% of annual runoff in Central Asia, but in the Northern Tien Shan it contributes 28% of annual runoff and 40-70% of summer runoff. Recent warming in Central Asia has accelerated glacial retreat. The upward trend in warming could lead to quicker snow and glacier melt. An increase in temperatures in Central Asia is well documented, however, there is no discernible trend in precipitation. Forested land cover could mitigate water loss.

An old landslide in the Tien-Shan Mountains near Lake Issyk-kul. Occurring n the night in 1906, villages below the mountain were affected with fatalities. Copyright: John Stanturf

Ironically, travelers from Bishkek to the conference center were delayed by a mudflow across the highway that followed heavy rains. Copyright: John Stanturf

Proceedings are available at: http://www.iufro.org/publications/proceedings/proceedings-meetings-2016/#c24928

There will be further discussion at the Asia-Oceania Regional Congress in Beijing in October: http://www.iufro-ao2016.org/en/