

## **Dendrochronology to reconstruct climate change in the moist temperate forest of Galiyat**

Zahid Rauf<sup>1,2</sup>, Samina Siddiqui<sup>2</sup>, and Adam Khan<sup>3</sup>

<sup>1</sup>*National Centre of Excellence in Geology, UoP;*

<sup>2</sup>*Pakistan Forest Institute (PFI), Peshawar;*

<sup>3</sup>*Botany Department in University of Lakki Marwat*

Moist temperate forests of Pakistan are under constant threat of climate change. Dendrochronology a study of annual growth rings of trees, and tree ring widths are dependent upon environmental/climate factors, therefore annual growth layers of trees can be used to reconstruct the climate change of the forest. The aim of this study was to use dendrochronological methods to reconstruct the last 165 years climate change and growth-climate change relationship. This was achieved by establishing a correlation between surface soil moisture and tree ring growth of *Abies pindrow* (Royle or Himalayan fir) growing in the moist temperate forests of Galiyat. Tree-rings are one of the important natural proxy, which have the ability to store all related information of climate, where they are confined. This climatic information might be local or regional therefore, knowledge of tree-rings study is crucial. Around hundreds of core tree samples were collected from Breast Height (BH) and were studied. The results of this study show that surface soil moisture data (SSMs) when correlated with tree ring growth for reconstruction only June was correlated with 0.201. It was observed that from 1917 was the wettest SSM whereas 1921 was the driest SSM. It is concluded from the present study that winter SSM proved to be the most important months for climate change and had an impact on tree ring in the Western Himalayas. This study revealed the contention that SSM is a very important parameter that can be used to reconstruct the climate change when correlated with tree ring growth. Thus, dendrochronology provides a detail information about the changes occurred in the tree ring growth during wet and dry seasons and the most abrupt change represent the extreme climate change may occur during the year.