Streamflow is contributed by both rainfalland snow melt runoff from the catchments situated in the Himalaya. There are time-space variations in stream flow owing to the changes in climateand land cover. Moreover, water resources in mountain ecosystem play significant role, not only in supporting the livelihood of the upstream population but also for the livelihood of the downstream population.Therefore, it isessential to quantify thedischarge during different periods of the year and assess its sensitivity in the basin under different climate and land cover change scenarios by mid-centuryfor determining water availability as well as its management. Temperature, rainfall, relative humidity and wind speed data of Manali, Bhuntar(1969-2010) and Katrain (1985-2015) were taken from IMD and IARI. Post monsoon season Landsat images of 1980 and 2015 were used for LULC mapping. MOD10A1 data was also used for snow cover mapping of the basin.CartosatDEM of 30 m spatial resolution was also acquired for obtaining the topographical details of the area to develop a decision tree to prepare the land cover map.Soil and Water Assessment Tool (SWAT) was applied to estimate the streamflow which was calibrated and validated using the observed streamflow of Thalout station.It has been observed that the flow showed large scale fluctuations under different scenarios. The fluctuations in discharge conditions will influence the water availability conditions in the Beas basin.