EVALUATION OF CLIMATE CHANGE IMPACT ON TEMPERATURE, RAINFALL AND DISCHARGE IN A RAIN, SNOW AND GLACIERFED WATERSHED IN HIMACHAL PRADESH

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ABSTRACT

As per IPCC report the mean annual temperature of Earth's surface has increased by 0.6°C over the last century and it is expected that by 2100 the increase in temperature could be 1.4°C to 5.8°C. Indian mountain glaciers and weather system are key variables for early detection strategies in the regional climate related observations. Therefore, the present study has been undertaken in the Parvati watershed of upper Beas basin to know the long term variability of annual temperature, rainfall and discharge in the light of the global warming. The Parvati watershed is elongated in shape and covers an area of about 1940 km^2. The investigation has shown that glaciated area over the watershed has receded 11.55 km^2 from 1962 to 2001 due to global warming in the watershed. The trend analyses of the precipitation data in the basin suggest that there is not a significant change in the amount of precipitation in any of the seasons. Temperature trends in the basin clearly demonstrated a slight increase in the temperature in all the seasons but only the winter season temperature has demonstrated a significant positive change. Further global warming reflections on the water discharge have not been observed accordingly and a significant

decrease has been observed in the annual, seasonal and monthly flow pattern of the watershed from 1968-2008. This declining trend in the discharge is largely attributed to the waning of the small glaciers and ice patches to a large extent. This reduction in water availability from the watershed will influence agricultural activities in the downstream areas and thus affecting local as well as national economy.