



Trends of Stream flows, Precipitation and Temperature in Central Highland of Ethiopia

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Abstract: The knowledge of trends in low and peak flows is important in the planning, designing and construction of hydraulic structures and water supply systems. Likewise, the knowledge of trends of precipitation is also important for early warning system and to also forecast the probability of the future occurrence. Methods of forecasting low flows, peak flows, precipitation and temperature are introduced to four watersheds in the central highland of Ethiopia. The least-square method of linear regression was used to derive equations of low and peak flows which take into consideration the land slope, watershed area, precipitation, and the ratio of water storage. Statistical procedures for trend analyses were also used to derive linear trend equations from 35 years of low flows, peak flows, precipitation, and temperature data series. Both set of equations derived for low and peak flows gave very close results in which it can be concluded that they are capable of giving good estimates of low and peak flows of the future. The trend analyses of low flows have showed that most of the perennial rivers in West Shewa will dry out during non-rainy seasons after 204 years, if the trends of the low flows continue in the future as they have been for the last 35 years. The analyses of peak flows have showed that there will be no peak flows in those rivers after 189 years, if the trends of the peak flows continue in the future as they have been for the last 35 years. The trend analyses have also showed that there have been average annual increments of 1.6 mm in rainfall and 0.1oC in temperature for the last 35 years. Such information will help early warning workers to alert the people and the decision making body about the possible ecological and environmental holocaust. This small scale research work needs further research to map it to the larger scale.