



Linkages between precipitation and discharge trends in Central Vietnam

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Trend detection in precipitation and river discharge datasets can provide important insights into the impacts of climatic variability and change. Regions with poor observed hydrometeorological data coverage, often coincident with developing countries, are particularly prone to effects of changes in rainfall and temperature.

In such regions, e.g. Central Vietnam, which are frequently affected by floods and droughts, knowledge about climate trends and their evolution over time is essential to project potential impacts on local water availability, agricultural productivity and risk analysis. Consequently, the quantification of the impact of global climate change in poorly gauged regions is of crucial importance for stakeholders and policy makers.

In this study, we analyse change in rainfall, temperature and river discharge over the last three decades in Central Vietnam. To overcome the limited data availability, the high resolution APHRODITE gridded dataset is used in addition to the existing rain gauges network. Finally, linkages between discharge changes and trends in rainfall and temperature are explored.

Results are indicative of an intensification of rainfall (+15%/decade), with more extreme and longer events. A significant increase in winter rainfall and a decrease in consecutive dry days provides strong evidence for a lengthening wet season in Central Vietnam. In addition, trends based on APHRODITE suggest a strong orographic signal in winter and annual trends. These results underline the local variability in the impacts of climatic change at the global scale. Consequently, it is important that change detection investigations are conducted at the local scale. A very weak signal is detected in the trend of minimum temperature (+0.2°C/decade). River discharge trends show an increase in mean discharge (31% to 35%/decade) over the last decades. Between 54 and 74% of this increase is explained by the increase in precipitation. The maximum discharge also responds significantly to precipitation changes leading to a lengthened wet season and an increase in extreme rainfall events. Such trends can be linked with a likely increase in floods in Central Vietnam, which is important for future adaptation planning and management and flood preparedness in the region.