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Takahashi, Hideo / FUKUSHIMA, Azusa

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Regional and Seasonal Variability of Rainfall Characteristics in Nepal

FUKUSHIMA Azusa* and TAKAHASHI Hideo**

(*Graduate Student, Tokyo Metropolitan University,

**Department of Geography, Tokyo Metropolitan University)

Regional and seasonal variability of rainfall characteristics was investigated in Nepal on the southern slopes of the Himalayas using long-term daily rainfall data. Cluster analysis was applied to define subregions in Nepal based on the seasonal progression of precipitation. The results identified four subregions. The characteristics of the seasonal progression of daily average precipitation indicate the significance of premonsoon rainfall in April and May in the eastern part of Nepal. Comparisons of seasonal changes in rainfall characteristics in each subregion showed that increases in rainfall amount, number of days on which rain falls, and rainfall intensity occur during the summer monsoon season with a peak in July, except in the western mountainous region. In the western region and northern part of the eastern mid-hill region, rainfall amount and rainfall intensity increase in the winter season. Moreover, a significant change in rainfall intensity occurs in the eastern Terai region between the summer and winter season.

Key words: daily precipitation, Nepal, Himalayas, premonsoon, rainfall characteristics

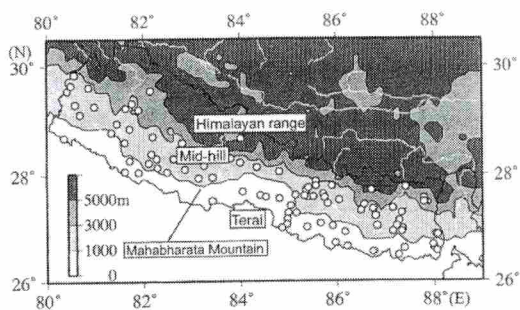


Fig. 1 Rain gauge stations used in this study

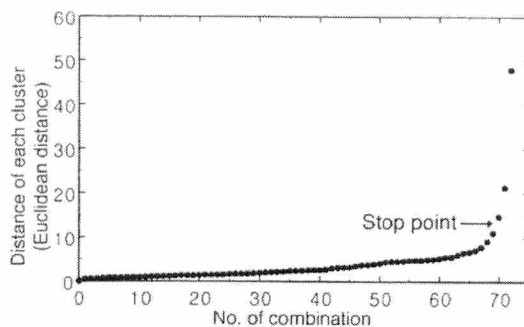


Fig. 2 Time-evolution of the unifying process in cluster analysis

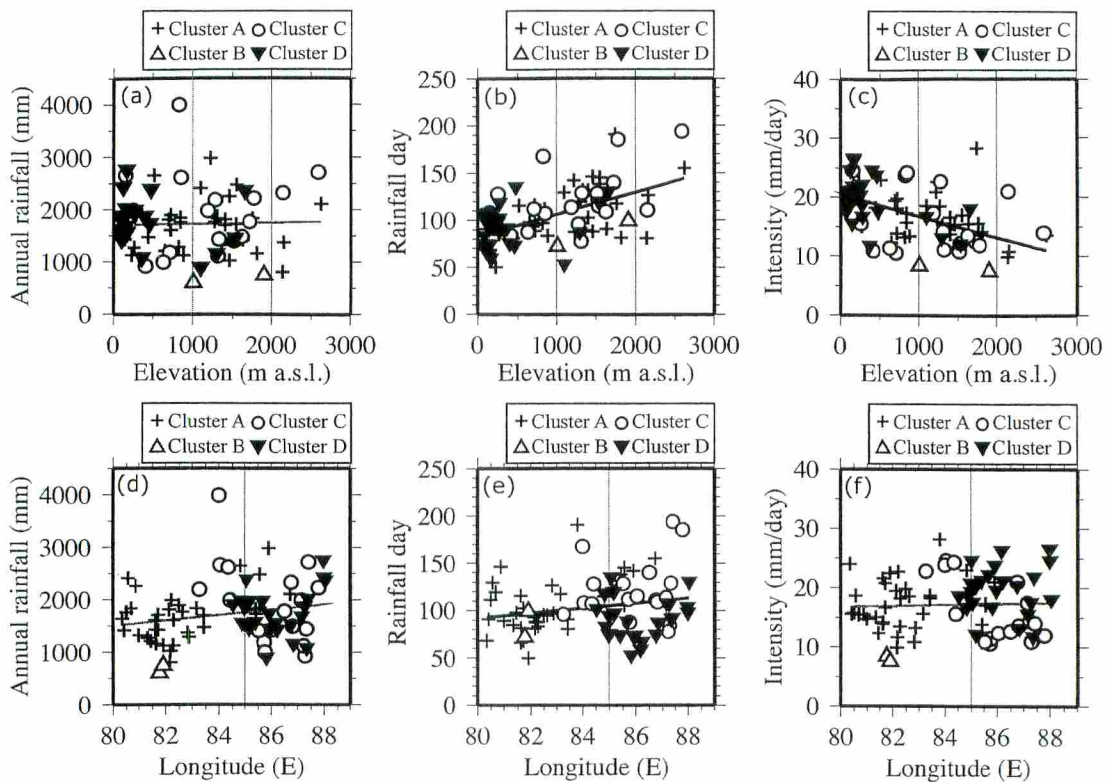


Fig. 5 Altitude and longitudinal effects of rainfall characteristics at each station

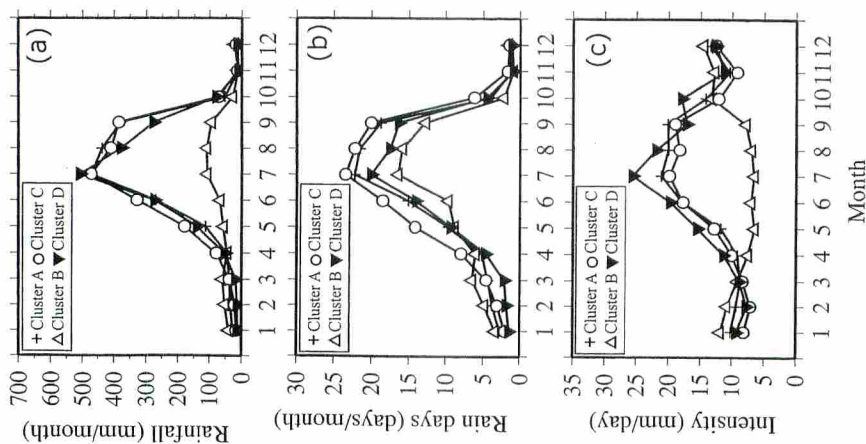
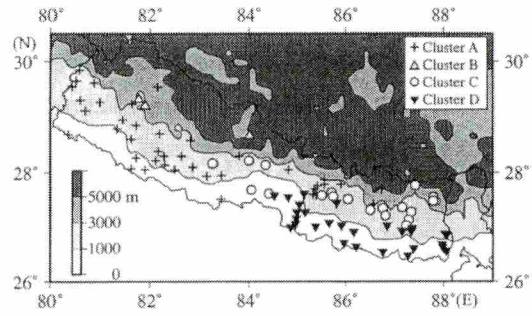


Fig. 6 Seasonal change in rainfall characteristics in each cluster



Cluster A (+), Cluster B (Δ), Cluster C (O),
Cluster D (▼)

Fig. 3 Distribution of subregions identified in cluster analysis in Nepal

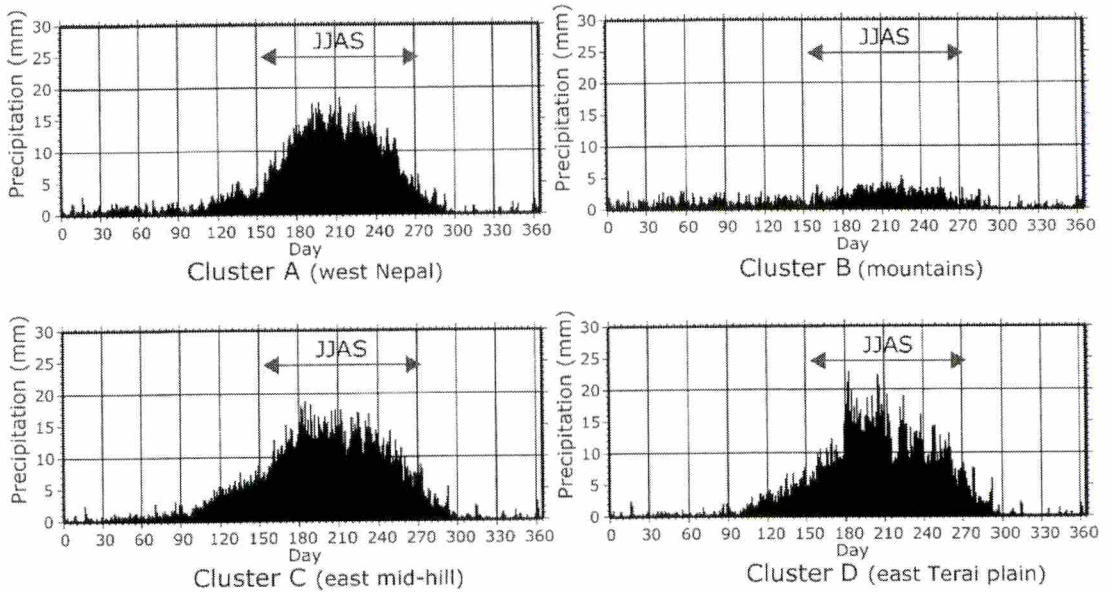


Fig. 4 Climatologic mean of daily precipitation in the four subregions