A weather phenomenon such as a typhoon, Changma front, and severe rain storm generates regional heavy rainfall being combined with the complicated orographic effect. One of important meteorological element that affects variation of spatial and temporal change is elevation. Especially, spatial distribution of rainfall is changed following the orographic effect in mountain area. More than 70% of the Korea is formed to mountain. Hence flash flood damage at mountains area that is combined with orographic rainfall is increasing. Consequently we need the forecast of heavy rainfall occurred area by orographic effect and response plan for reducing of flood damage in mountain area. In this study, we attempt to estimate the optimal real-time radar rainfall and forecasted rainfall using ground gauge and radar rainfall for rainfall forecast and analysis in mountain area. We generated the ground gauge rainfall fields and radar rainfall fields considering elevation effect using cokriging. And we applied the conditional merging method for obtaining spatial structure of the optimal field by the radar rainfall and rainfall values by the gauge rainfall. The study area is the Han River basin which is the largest river basin in Korea. The result indicates that useful results for optimal rainfall estimation at the Youngseo region in Han River basin that receive the orographic rainfall effect are obtained. We also applied the optimal forecasted rainfall and flow nomograph for the flood forecasting at Cheong-gye stream in Seoul. It can be seen that the applied method in this study improves the accuracy of flood forecasts and lead-time.