Nowadays, climate change due to global warming is generating the increase of rainfall intensity and the variation of rainfall characteristics, causing many difficulties for water resources management and flood control. This increase of rainfall due to climate change leads to the change of flood design in engineering field, and influences on design criterion in hydraulics structure and river levee level. However, design criterion has not been fully investigated in South Korea. The objective of this study is to suggest an approach for estimating probability rainfall using climate scenario data based GCM and to analyze changes of flood characteristics like probability rainfall, flood quantile and flood water level under climate change. The study area is Namhan river basin in South Korea. Probability rainfalls which is taken 1440 minutes duration and 100-year frequency are estimated by using IPCC SRES A2 climte change scenario for each time period(S0: 1971~2000; S1:2011~2040; S2:2041~2070; S3:2071~2100). Flood quantiles are estimated for 17 subbasins and flood water level is analyzed in the main channel from the downstream of Chung ju dam to the upstream of Paldang dam. Probability rainfalls, peak flow from quantile and water depth from flood water level have increase rate in the range of 13.0~15.1% based S0(142.1mm), 29.1~33.5% based S0(20,780m3/s), 12.6~13.6% in each S1, S2 and S3 period, respectively. These results may help in future flood risk management of water resources on South Korea.