Statistical Downscaling (SD) modelling have been prepared based on the existence of functional relationships between the local scale (response) with a global-scale GCM (General Circulation Model) as predictor variables as in regression models. However, there are some problems in the SD modeling, one of them is the dimension reduction. In this research, dimension reduction method that used is Principal Component Analysis (PCA). Then, the results of PCA dimension reduction, called by the principal components will be used in SD modeling using Principal Component Regression (PCR) and Projection Pursuit Regression (PPR) method. Both methods were then compared with the criteria of prediction RMSEP dan $R^2_{\text{prediction}}$ to obtain the best model. The results of this research is that the SD model validation with PPR method gives better results than the PCR method, especially for domains of 3x3 and 8x8 with an average value of RMSEP $= 82.1$ and $R^2_{\text{prediction}} = 68.3\%$ for domain 3x3, and average value of RMSEP $= 81.5$ and $R^2_{\text{prediction}} = 68.5\%$ for domain 8x8.

Keyword: GCM, Statistical Downscaling, PCA, PCR, and PPR