watershed model. This value is chosen based on the results of the peak discharge values that are the closest to the observation peak discharge.

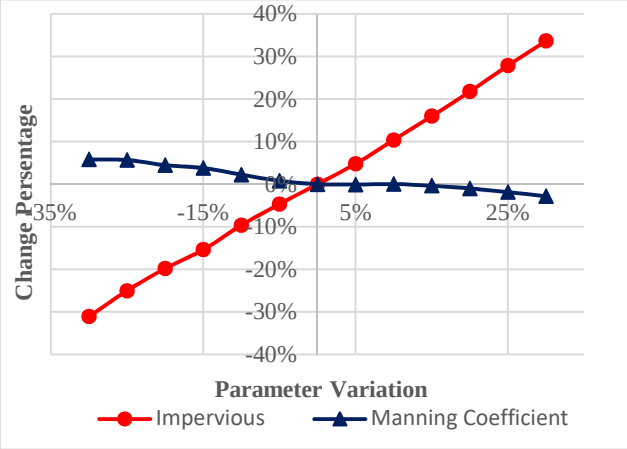

Fig. 7 Sensitivity analysis graph for the variation of each parameter

TABLE II
ELASTICITY RATIO

Rank	Parameter	Elasticity Ratio Value
1	Impervious	1.0794
2	Curve Number	0.1441

C. *Sensitivity Analysis*

Sensitivity analysis is performed on the parameters that used for the SCS Unit Hydrograph and SCS Curve Number. The sensitivity analysis in this study is used for evaluating the event model. There are four parameters analyzed for sensitivity, these parameters include the curve number, impervious, lag time, and manning coefficient. One of these parameters will be analyzed by changing the parameter values to vary with a range of -30% to 30% and the interval used is 5%, while the other parameters are fixed at a constant. The sensitivity analysis graph and Elasticity Ratio value for each parameter can be seen in Fig. 7 and Table II.

From the results of the above table, from the two studied parameters, impervious is the most influential parameter and sensitive to the parameter changes made. When compared with the manning coefficient, the impervious has a higher level of sensitivity. Changing the impervious parameter will increase the peak discharge value when the parameter value gets bigger. Meanwhile, changing the manning coefficient parameter to the smaller value will cause the peak flow of the simulated results greater.

IV. CONCLUSIONS

Based on the analysis and discussion above, several conclusions can be summarized as follow: In this study, the sub-catchment distribution for the rainfall-runoff modelling has a significant influence on the simulation results. It is caused by the structure of the model formed based on the division of stream order. In this study, the most optimal results are produced in models with sub-catchment distribution based on the first order. It can be concluded that the greater the number of sub-catchment distributions performed is, the batter the performance models will be produced. From the comparison of simulation results for various types of graphs on the SCS Unit Hydrograph method, it can be concluded that based on the R^2 value, the determination of the PRF is very influential on the simulation results of the model. PRF 250 was chosen used in the Malino watershed model. This value is chosen based on the results of the peak discharge values that are the closest to the observation peak discharge. From the results of the sensitivity analysis conducted on the selected parameters, it was concluded that the impervious is the most sensitive parameter. Hence, in rainfall-runoff modelling, small changes in the impervious parameter can have a large effect on the simulation results. These parameters are also the most parameter that can be used to calibrate manually.

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