Sobol' total sensitivity index

$Y \rightarrow SD, \ X_i \rightarrow LULC$

Sobol' first-order sensitivity index

X_i

$V_{X_i}(Y|X_{\sim i})$

Variance

$E_{X_{\sim i}}(V_{X_i}(Y|X_{\sim i}))$

Mean of variance

$E_{X_{\sim i}}(Y|X_i)$

Mean

$V(Y)$

Total Variance

$V_{X_i}(E_{X_{\sim i}}(Y|X_i))$

Variance of mean

Mean

$$ST_{X_i} = \frac{E_{X_{\sim i}}(V_{X_i}(Y|X_{\sim i}))}{V(Y)}$$

$$S_{X_i} = \frac{V_{X_i}(E_{X_{\sim i}}(Y|X_i))}{V(Y)}$$