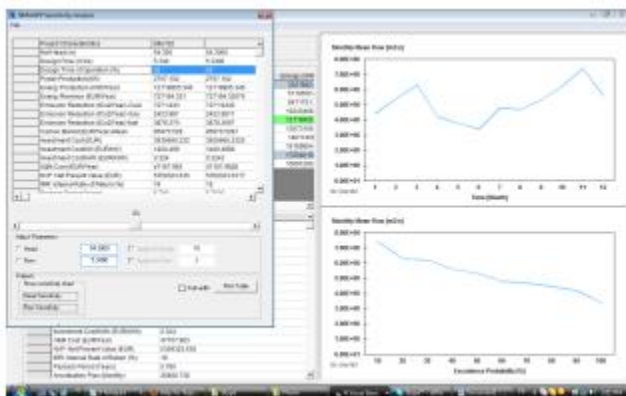


relative output change is expressed in terms of a sensitivity index (SI), which is the ratio of output variation to parameter variation.

The parameters considered for the sensitivity analysis are the design flows and net hydraulic heads. Please note that, if multiple hydro site or scenarios are being simulated in a single run, the sensitivity analysis module takes the information related to a hydro site which is active in the Simulator window. Similar operation can be performed for each site or scenario. Below is the Sensitivity Analysis interface capturing project characteristics information for any %Time of operation chosen by the user.

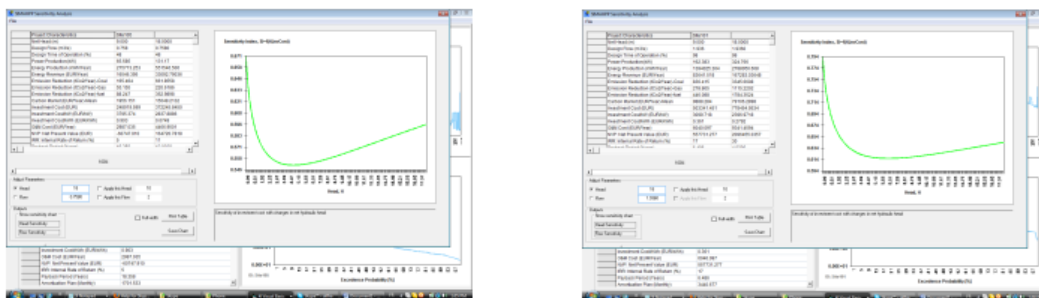


Key features of the sensitivity analysis module:

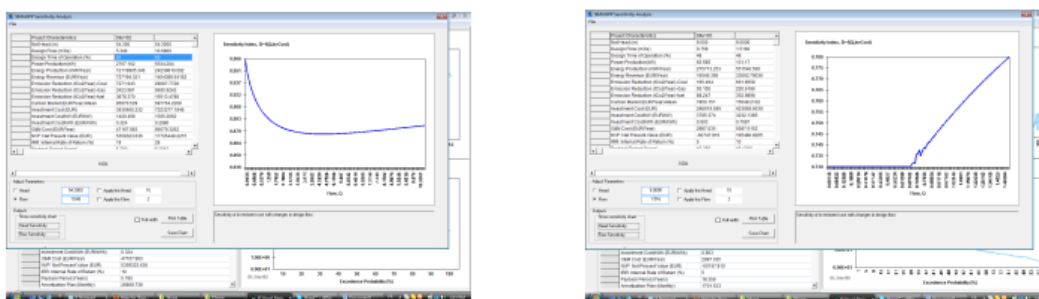
- *Manual parameter adjustment using the slide bar.* With this feature users can make a %Change of the chosen parameter (head or flow) and see instant outputs in the project characteristics table. Parameters can be adjusted as needed and the corresponding outputs can be recalculated. In this case, each parameter has to be chosen and the corresponding “Adjust” box must be checked in order to tell the program that parameters are modified to update the default output. If both boxes are checked, project characteristics can be recalculated by clicking at the “Update and Calculate” button.
- *Automatic sensitivity analysis.* This can be effected for each parameter (head or design flow) for the range from -100% to +100% of its original value. This section automatically calculates the sensitivity index (SI) and plots a chart corresponding to the parameter under consideration. For instance, the SI relative to the head ranges can be calculated and plotted by simply clicking at the “Head sensitivity” button. Similarly, the SI relative to the design flow ranges can be calculated and plotted using the “Flow sensitivity” button.

- **Print project characteristic table.** This is particularly important if parameters are modified and project characteristic information are updated as an output that gives more sense to the user with respect to the hydropower project feasibility study under consideration. An option to print as full size or not is also provided with the print feature. A default printer can be chosen from the print preview page. Alternatively, the output can be exported as a PDF document if a PDF writer (printer) is available in the printers list.
- **Save SI charts.** This can be effected using the “Save charts” button shown below the Print button. The chart is saved in a default path similar to the path of the main project file being simulated. This path is printed in the field below the chart so that it can easily be localized and retrieved for use in a report, presentations, or other communication medias. The charts are saved in Windows Bitmap format with a file name convention as “ProjectName_SI_ParameterName.bmp”. For instance, the SI-Head chart is saved as “ProjectName_SI_Head.bmp”. The same is true for the flow chart.

3. Some example charts from the sensitivity analysis



Example showing a SI chart plots with respect to head ranges for a chosen %Time and hydro site/scenario.



Example showing a SI chart plots with respect to flow ranges for a chosen %Time and hydro site/scenario.