

4.3 Calibration

Observed water levels and discharge were available for three gauging stations in the crucial Mekong/Tonle Sap confluence area at Phnom Penh. The locations of the three stations are shown on Figure 9. The stations are Kompong Cham on the Mekong upstream the Tonle Sap confluence, Prek Kdam in the Tonle Sap river and Neak Luong on the Mekong downstream Phnom Penh, i.e. after the division into Mekong and Bassac.

The model was calibrated by adjusting the roughness coefficient (the Manning number), flood plain storage and in some cases the cross-section profiles, in order to achieve a good correspondence between observed and simulated water levels and discharges. Since the topographical information in the model is relative scarce and therefore left quite large gaps, it was considered acceptable to do modifications to the information that was more an estimate than a result of measurements.

Figure 31 shows the result of the calibration, in terms of a good fit between observed (coloured markers) and simulated (black) water levels in the Tonle Sap river at Prek Kdam gauging station, which is a key location. There are only insignificant differences, and the maximum water levels are correctly simulated. This is especially important, because the water levels at this location are closely related to the Lake water level. The lower figure of Figure 31 shows the discharges at the same station. The above-zero part of the curve signifies flow from the Lake to the Mekong, while the below-zero part of the hydrographs signifies the reverse flow during the early flood season, while the Mekong rises. It should be noted that the below-zero part of the curve has good correspondence to observed discharges. Also the time of flow reverse (when the discharges rapidly change from negative to positive) is correctly simulated. However the period with flood recession has less good correspondence, i.e. the above-zero part of the hydrograph. This is the late flood season when the Mekong is receding and the Lake is being emptied. The peak of the above-zero hydrograph limb is the moment when the gradient between the Lake and the Mekong is at its largest, i.e. when the Mekong level is rapidly decreasing. The maximum water level in the Lake however occurs when the flow reverses, so it is considered less significant that the discharge out of the Lake is not quite in agreement with the observation.

Figure 32 (upper graph) shows simulated and observed discharges in the Mekong at Neak Luong, downstream Phnom Penh, i.e. where the flow has been divided between Mekong and Bassac. Simulated discharges are in good correspondence with the observed ones, however mostly on the rising limb of the hydrograph, i.e. in the early and maximum flood season.

The lower graph of Figure 32 shows observed and simulated water levels in the Mekong at Kampong Cham, upstream Phnom Penh. The correspondence is very good.

It is concluded that as a result of the calibration, the model simulates the water levels and discharges in the Meong/Tonle Sap system in a realistic way, which is satisfactory for simulating the impacts of upstream water use.

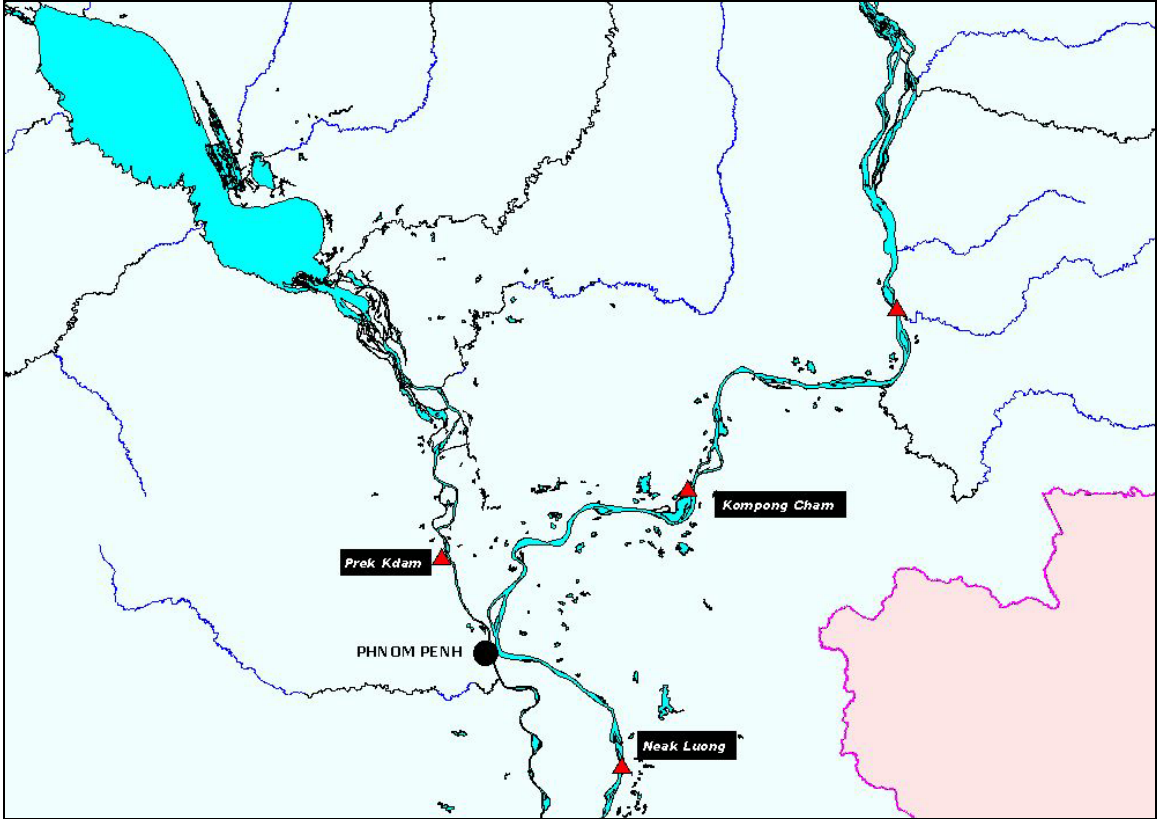


Figure 9 Location of gauging stations used for calibration (triangles).