4.2 Input Data

The upstream boundary condition (i.e. input information) is observed discharges at Kratie in the baseline simulation. In the scenario simulation (NT2 impacts and 2025 cumulative impacts), the upstream boundary is the corresponding scenario discharge at Kratie, as calculated for the middle Mekong Basin.

The downstream boundary condition (i.e. input time series at the downstream model end) is the sea level of the South China Sea, with tidal variation. The variations of sea levels and tidal amplitudes over the year were provided by WUP-JICA (2003). The tidal amplitude is more than 3m (i.e. +/-1.5m), and the tidal variations can be observed as far upstream as Phnom Penh, 330 km from the Sea (+/- 0.15m). The true tidal movement is rather complex, with different superimposed oscillations with different periods. In this model, a simplified tidal movement was applied, with a constant tide pattern throughout a month. The tidal patterns are seen on the simulation results shown on Figure 30.

Topographic information (river cross-sections) was available on the Internet home page of the Mekong River Commission (MRC) for a number of locations. Cross section locations are indicated on Figure 8 as small rectangles. A number of example cross sections are shown as Figure 28. In addition to the explicit cross section information from the MRC homepage, additional topographic information was available in WUP-JICA (2003), in terms of general descriptions of major morphological features of the Delta.

Floodplain storage is an important feature in the Tonle Sap/Delta area, i.e. the storage of large volumes outside the ordinary river profile during floods. Tonle Sap Lake is the most important of such storages, but also along Mekong and Bassac further downstream there are large floodplains. Realistic amounts of floodplain storage were estimated by inspecting inundation maps and comparing with simultaneous water level observation. Figure 29 shows the inundation on the 30. August 2001 (water level at Prek Kdam in Tonle Sap river 9.3 m (see Figure 9)).

Concerning the storage volume of Tonle Sap Lake, a relationship between lake area and lake level has been developed by Tes (1998). In a very comprehensive study, CTI/DHI (2003) have established a detailed storage curve, which gives somewhat larger areas than Tes' curve, which is apparently because the former (CTI/DHI) considers a larger area in the curve. In this study, the areas by Tes were attributed to the cross-sections in the lake itself, while additional areas (estimated by studying inundation maps) were attributed to cross-sections in the Tonle Sap River. It is therefore estimated that *total* areas included in this model are in correspondence with the CTI/DHI figures.

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 Phnpm 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.