SUMMARY

The Ganga Delta: Located in India and Bangladesh, the Ganga–Brahmaputra Delta is the largest in the world. It is one of the most fertile regions of the world and covers approximately 105,000 km$^2$ of Bangladesh and the state of West Bengal in India. The western and northern parts of the Ganga–Brahmaputra Delta are bordered by the Chhotanagpur Plateau, Rajmahal Hills and the Meghalaya Plateau, while the southern and eastern boundaries are marked by the Bay of Bengal and Chittagong–Tripura Fold Belt, respectively. The southwestern part of the Ganga–Brahmaputra Delta, bounded by the Bhagirathi–Hugli River in the west and the Ganga (Padma) River in the north and east, is mostly contributed by the Ganga system and referred to as the Ganga Delta. The important distributaries and palaeodistributaries of the river that drain the Indian upper part of the Ganga Delta are the Bhagirathi–Hugli, Gobra Nala, Bhandardaha, Bhairab, Salmari, Jalangi, Mathabhanga, Ichhamati, Churni, Anjana and Jamuna. These distributaries are characterized by intense meandering and their channels have frequently shifted in the past.

Location of the study area: The area dealt in this work is the interfluve region between the Bhagirathi–Hugli and Ganga–Padma Rivers, which broadens from the off-take of the Bhagirathi River (24.5050°N, 88.0849°E). The Bhagirathi–Hugli and the Ganga–Padma Rivers delineate the western and northern boundaries of the region, respectively. The political boundary between India and Bangladesh serves as the eastern limit of the Upper Bhagirathi–Ganga Interfluve (UBGI), which approximately follows the Ichhamati course in its southern section. The southern margin of the study area is approximately demarcated by the Jamuna River—the southernmost cross stream between the Bhagirathi–Hugli and the Ichhamati.

Evolution of the distributary off-takes: The off-takes of the distributaries are affected by the continuous shifting of the parent river—Ganga. Presently, most of these do not receive any discharge from the Ganga during the lean season between November and May, due to sedimentation and subsequent clogging at the off-take points. As a result, discharge through the channels has reduced and the distributaries are getting degraded.

Degenerating river systems: Characterized by the presence of numerous meandering rivers, cutoffs and palaeocourses, the landscape development of the Upper Bhagirathi–Ganga Interfluve mostly depends on the discharge of the Ganga River. The distributaries of this region have frequently shifted their course in the past. Due to sedimentation at the headwaters, the distributaries remain sluggish during the non-monsoon season and discharge through these
channels is maintained by base flow. Not only the discharge through the seasonally active distributaries has reduced in the UBGI, but also it is characterized by a number of rivers which are in a state of complete decay. Presently, all these degraded rivers are detached from their parent channels and a substantial part of their courses have merged with accretion topography of the surroundings. The courses of the Gobra Nala, Chhota Bhairab, Sialmari, Upper Jalangi and Anjana are completely abandoned due to the disconnection of their headwaters from the parent stream.

**Flood hazard:** The UBGI gets flooded at regular intervals. Most of the distributaries in this region—in their present condition—are unable to contain the monsoon discharge within their banks. Consequently, the region has become susceptible to flood hazard. The last major flood occurred in this region in September 2000. In spite of large floods, alterations are minimal as far as the channel planforms are concerned—confirming the ‘moribund’ status of the region.

**Landforms:** The topography of the region is mainly characterized by natural levees and floodplains. A number of cutoffs are found near the present river courses. These and the occurrences of meander scars in the region indicate past shifting river courses.

**Management:** Dredging of the degenerated channels is often advocated for resuscitation purpose. However, it is difficult to sustain a dredged channel in an abandoned delta unless the operation is periodically repeated and this often proves difficult. Amongst all the deltaic rivers of West Bengal, only the Bhagirathi–Hugli is managed through the Farakka Barrage Project (FBP). The other distributaries of the study area continue to suffer from the closure of their off-takes due to sedimentation. This has significantly affected the landscape of the UBGI. With no convincing method of resuscitating the other distributaries, it seems that the adjustment to the altered flow conditions would be the best management alternative.