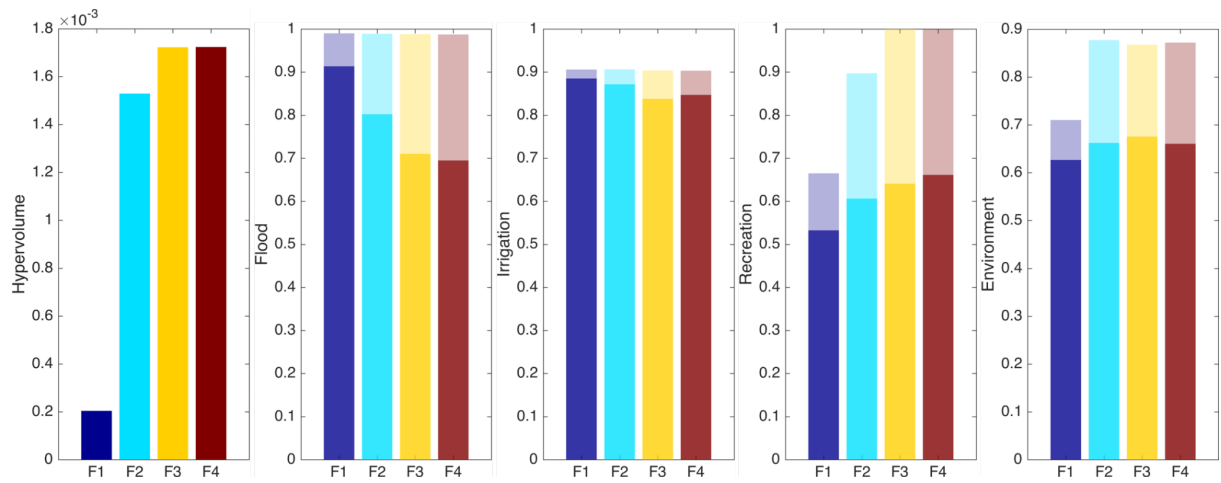
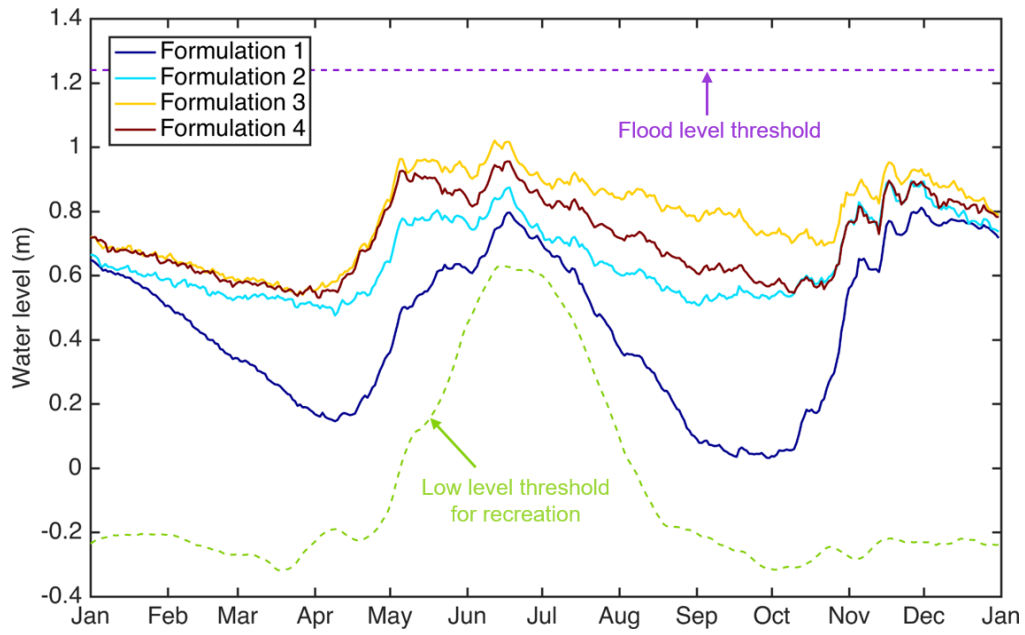


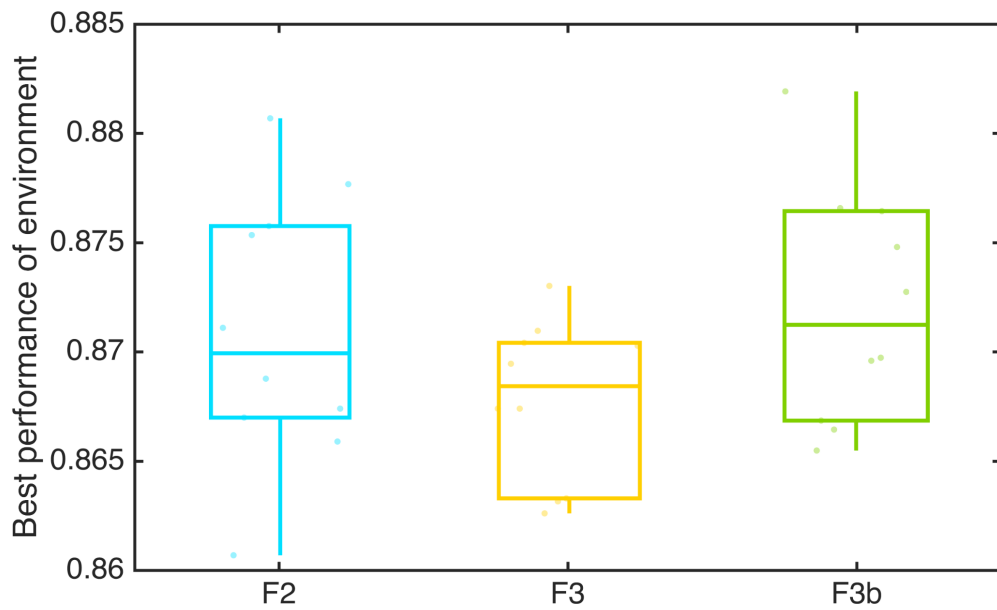
**Figure A1.** Number of compromise solutions for formulations F1-F4 that exceed increasing performance thresholds in all objectives.



**Figure A2.** Hypervolume indicator and best (transparent bar) and worst (solid bar) performance in each objective across the four formulations F1-F4.



**Figure A3.** Trajectories of average lake level for the best equitable solution in each problem formulation.



**Figure A4.** Boxplot of best performance of 10 random optimization trials of F2, F3, and F3b, which refers to a new problem formulation including flood, irrigation, and environment.

**Revised equation (7).**

$$J^E = \frac{n_E}{H} \quad (1)$$

where  $n_E$  is the number of days in the evaluation horizon  $H$  during which  $q_t^n - \sigma_t^n \leq r_{t+1} \leq q_t^n + \sigma_t^n$ , with  $q_t^n$  and  $\sigma_t^n$  representing the mean and standard deviation, respectively, of the Adda river flow in natural conditions. It is worth noting that the ecosystem in the case study is sensitive to both high and low flows, thus a field or range instead of a minimum flow (which is typically used) to describe the ecosystem requirements.