**Supplementary Material**

**Future Projection of Cryospheric and Hydrologic Regimes in Koshi River Basin, Central Himalaya, using Coupled Glacier Dynamics and Glacio-hydrological Models**

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**Table S1.** Hydrological station information for all the sub-basins of the Koshi River basin obtained from DHM.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Sub-basin | Hydrological Station | Latitude  (degree decimal) | Longitude  (degree decimal) | Elevation  (m a.s.l.) |
| Tamor | 684  (Majhitar) | 27.1583 | 87.7125 | 533 |
| Arun | 606  (Simle) | 26.925 | 87.158 | 152 |
| Dudhkoshi | 670  (Rabuwa Bazar) | 27.2666 | 86.6638 | 460 |
| Likhu | 660  (Sangutar) | 27.336 | 86.219 | 543 |
| Tamakoshi | 647  (Busti) | 27.6347 | 86.0866 | 849 |
| Sunkoshi | 630  (Pachuwarghat) | 27.5583 | 85.7527 | 589 |

**Table S2.** Meteorological station information for all the sub-basins of the Koshi River basin obtained from DHM, EV-K2-CNR and CMA.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Sub-basin | Meteorological  Station | Latitude  (degree decimal) | Longitude  (degree decimal) | Elevation  (m a.s.l.) |
| Tamor | 1308  1419\*  1403 | 26.93  27.15  27.55 | 87.33  87.75  87.78 | 365  1205  1780 |
| Arun | 1305  1325  1301\*  1317  S55655 (Dinggri) | 27.13  27.36  27.55  27.76  28.6 | 87.28  87.15  87.28  87.41  87.26 | 410  1190  1497  2590  4300 |
| Dudhkoshi | 1206\*  1219  Namche  Pheriche  Pyramid | 27.31  27.5  27.80  27.89  27.95 | 86.5  86.58  86.71  86.81  86.81 | 1720  2378  3560  4258  5050 |
| Likhu | 1207  1224 | 27.48  27.55 | 86.41  86.38 | 1576  1662 |
| Tamakoshi | 1123\*  1102  1103\* | 27.46  27.66  27.63 | 86.08  86.05  86.23 | 495  1940  2003 |
| Sunkoshi | 1036\*  1017  1006  1058  S55664 (Nylam) | 27.68  27.86  27.86  28  28.18 | 85.63  85.56  85.86  85.55  85.96 | 865  1550  2000  2480  3310 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | | Tamor | | Arun | | Dudhkoshi | | Likhu | | Tamakoshi | | Sunkoshi | |
| RCP4.5 | RCP 8.5 | RCP 4.5 | RCP 8.5 | RCP 4.5 | RCP 8.5 | RCP 4.5 | RCP 8.5 | RCP 4.5 | RCP 8.5 | RCP 4.5 | RCP 8.5 |
| Snow Melt (%) | 2021 - 2060 | 4 | 4 | 6 | 6 | 6 | 7 | 3 | 3 | 9 | 9 | 8 | 8 |
| 2061 - 2100 | 4 | 5 | 5 | 4 | 6 | 4 | 3 | 2 | 8 | 7 | 8 | 8 |
| Ice Melt (%) | 2021 - 2060 | 2 | 2 | 3 | 3 | 5 | 6 | 4 | 5 | 5 | 6 | 4 | 3 |
| 2061 - 2100 | 2 | 4 | 3 | 4 | 6 | 8 | 3 | 4 | 5 | 7 | 4 | 4 |
| Rain (%) | 2021 - 2060 | 49 | 49 | 38 | 38 | 47 | 47 | 49 | 49 | 46 | 46 | 43 | 44 |
| 2061 - 2100 | 49 | 47 | 38 | 37 | 47 | 46 | 50 | 50 | 46 | 45 | 43 | 42 |
| Base  flow (%) | 2021 - 2060 | 46 | 45 | 53 | 54 | 42 | 42 | 44 | 44 | 40 | 40 | 45 | 45 |
| 2061-2100 | 46 | 45 | 55 | 56 | 42 | 43 | 45 | 45 | 42 | 43 | 46 | 47 |

**Table S3.** Contribution from snow melt, ice melt, rain and baseflow to future discharge in all the sub-basins of the Koshi River basin under RCP 4.5 and 8.5 scenarios during two future reference periods: 2021 – 2060 and 2061 – 2100.