

Report on prioritization of Micro-watersheds of 2C2A sub-catchment of Betwa RVP catchment (2C2A 1-8 Watersheds) of Yamuna Basin, Districts Hamirpur, Jalaun, Jhansi and Mahoba of Uttar Pradesh and Districts Chattarpur, Datia, Shivpuri, Gwalior and Tikamgarh of Madhya Pradesh

Abstract

1. **Survey area** : 2C2A sub-catchment of Betwa RVP catchment Yamuna Basin, Districts Hamirpur, Jalaun Jhansi and Mahoba of Uttar Pradesh and Districts Chattarpur, Datia, Shivpuri, Gwalior and Tikamgarh of Madhya Pradesh.
2. **Location** : 25⁰5' 0" to 26⁰3' 0" N latitude 78⁰10' 30" to 80⁰13' 0" E longitude.
3. **Total area** : 7,20,787 ha
4. **Agroclimatic Region** : Bundelkhand zone of Central Plateau & Hill region (viii) as per planning commission (Khanna, 1989)
5. **Period of Survey** : November 2005 to March 2006
6. **Type of Survey** : Rapid Reconnaissance Survey
7. **Base Material Used** : Survey of India Toposheet (1:50,000scale)

8. Areal Extent of different Erosion Intensity Mapping Units

| Sl.No. | EIMU | Weightage Value | Delivery Ratio | Area(ha) | Area(%) |
|--------------------|------|-----------------|----------------|---------------|---------------|
| 1 | A01 | 21 | 0.82 | 5801 | 0.80% |
| 2 | A02 | 19 | 0.76 | 6365 | 0.88% |
| 3 | A03 | 19 | 0.76 | 32708 | 4.54% |
| 4 | A04 | 18 | 0.72 | 11244 | 1.56% |
| 5 | A05 | 17 | 0.70 | 51500 | 7.14% |
| 6 | A06 | 16 | 0.67 | 14605 | 2.03% |
| 7 | A07 | 15 | 0.65 | 4741 | 0.66% |
| 8 | A08 | 14 | 0.61 | 7380 | 1.02% |
| 9 | A09 | 14 | 0.60 | 85228 | 11.82% |
| 10 | A10 | 14 | 0.61 | 184 | 0.03% |
| 11 | A11 | 12 | 0.56 | 3173 | 0.44% |
| 12 | A12 | 12 | 0.54 | 951 | 0.13% |
| 13 | A13 | 13 | 0.58 | 117396 | 16.29% |
| 14 | G01 | 17 | 0.90 | 3265 | 0.45% |
| 15 | G02 | 15 | 0.85 | 4902 | 0.68% |
| 16 | G03 | 18 | 0.88 | 3609 | 0.50% |
| 17 | G04 | 14 | 0.80 | 3810 | 0.53% |
| 18 | G05 | 15 | 0.69 | 7698 | 1.07% |
| 19 | G06 | 14 | 0.67 | 1493 | 0.21% |
| 20 | G07 | 14 | 0.68 | 332 | 0.05% |
| 21 | G08 | 13 | 0.67 | 10576 | 1.47% |
| 22 | G09 | 16 | 0.70 | 18463 | 2.56% |
| 23 | G10 | 15 | 0.75 | 19803 | 2.75% |
| 24 | G11 | 17 | 0.69 | 5962 | 0.83% |
| 25 | G12 | 16 | 0.69 | 2603 | 0.36% |
| 26 | G13 | 18 | 0.74 | 1844 | 0.26% |
| 27 | G14 | 15 | 0.62 | 132099 | 18.33% |
| 28 | G15 | 15 | 0.67 | 15530 | 2.15% |
| 29 | G16 | 16 | 0.68 | 1996 | 0.28% |
| 30 | G17 | 12 | 0.68 | 1193 | 0.17% |
| 31 | G18 | 14 | 0.67 | 13959 | 1.94% |
| 32 | G19 | 12 | 0.61 | 5137 | 0.71% |
| 33 | G20 | 18 | 0.70 | 2821 | 0.39% |
| 34 | G21 | 13 | 0.59 | 65371 | 9.07% |
| 35 | G22 | 13 | 0.57 | 465 | 0.06% |
| 36 | HA | 0 | 0.00 | 35641 | 4.94% |
| 37 | Q | 0 | 0.00 | 158 | 0.02% |
| 38 | RI | 0 | 0.00 | 16974 | 2.35% |
| 39 | W | 0 | 0.00 | 3709 | 0.51% |
| 41 | v | 0 | 0.00 | 98 | 0.01% |
| Grand Total | | | | 720787 | 100.00 |

9. Watershedwise distribution of area under different Erosion Intensity Mapping Units

| EIMU | Area(ha) | | | | | | | | Area(ha) | Area (%) |
|--------------|--------------|---------------|---------------|--------------|--------------|--------------|--------------|---------------|---------------|---------------|
| | 2C2A1 | 2C2A2 | 2C2A3 | 2C2A4 | 2C2A5 | 2C2A6 | 2C2A7 | 2C2A8 | | |
| A01 | 1625 | 1191 | 86 | 1598 | 203 | 1098 | 0 | 0 | 5801 | 0.80 |
| A02 | 2702 | 695 | 1176 | 0 | 1792 | 0 | 0 | 0 | 6365 | 0.88 |
| A03 | 926 | 16228 | 5839 | 5769 | 1258 | 2668 | 0 | 0 | 32708 | 4.54 |
| A04 | 6196 | 326 | 0 | 3542 | 688 | 254 | 156 | 82 | 11244 | 1.56 |
| A05 | 12367 | 17904 | 4418 | 7097 | 4582 | 5132 | 0 | 0 | 51500 | 7.14 |
| A06 | 7306 | 999 | 99 | 3680 | 2103 | 137 | 182 | 99 | 14605 | 2.03 |
| A07 | 3117 | 0 | 0 | 1105 | 266 | 147 | 106 | 0 | 4741 | 0.66 |
| A08 | 887 | 2654 | 968 | 1848 | 35 | 988 | 0 | 0 | 7380 | 1.02 |
| A09 | 11566 | 25029 | 15861 | 14653 | 4635 | 13484 | 0 | 0 | 85228 | 11.82 |
| A10 | 0 | 0 | 0 | 0 | 22 | 162 | 0 | 0 | 184 | 0.03 |
| A11 | 995 | 825 | 76 | 76 | 1011 | 125 | 65 | 0 | 3173 | 0.44 |
| A12 | 800 | 0 | 0 | 151 | 0 | 0 | 0 | 0 | 951 | 0.13 |
| A13 | 26779 | 38693 | 2292 | 33102 | 6597 | 9933 | 0 | 0 | 117396 | 16.29 |
| G01 | 0 | 0 | 3028 | 0 | 68 | 0 | 169 | 0 | 3265 | 0.45 |
| G02 | 0 | 0 | 2980 | 0 | 0 | 272 | 888 | 762 | 4902 | 0.68 |
| G03 | 0 | 0 | 63 | 0 | 15 | 368 | 614 | 2549 | 3609 | 0.50 |
| G04 | 0 | 0 | 1860 | 0 | 12 | 153 | 298 | 1487 | 3810 | 0.53 |
| G05 | 0 | 0 | 7601 | 0 | 0 | 97 | 0 | 0 | 7698 | 1.07 |
| G06 | 0 | 0 | 1493 | 0 | 0 | 0 | 0 | 0 | 1493 | 0.21 |
| G07 | 0 | 0 | 0 | 0 | 0 | 82 | 99 | 151 | 332 | 0.05 |
| G08 | 0 | 0 | 0 | 0 | 0 | 0 | 4027 | 6549 | 10576 | 1.47 |
| G09 | 0 | 0 | 18429 | 0 | 34 | 0 | 0 | 0 | 18463 | 2.56 |
| G10 | 0 | 0 | 0 | 0 | 0 | 272 | 4029 | 15502 | 19803 | 2.75 |
| G11 | 0 | 0 | 5017 | 0 | 0 | 0 | 0 | 945 | 5962 | 0.83 |
| G12 | 0 | 0 | 187 | 0 | 1077 | 181 | 628 | 530 | 2603 | 0.36 |
| G13 | 0 | 0 | 0 | 0 | 500 | 903 | 71 | 370 | 1844 | 0.26 |
| G14 | 0 | 0 | 69334 | 0 | 0 | 2284 | 17401 | 43080 | 132099 | 18.33 |
| G15 | 0 | 0 | 625 | 0 | 0 | 0 | 423 | 144482 | 15530 | 2.15 |
| G16 | 0 | 0 | 52 | 0 | 770 | 488 | 588 | 98 | 1996 | 0.28 |
| G17 | 0 | 0 | 382 | 0 | 42 | 409 | 0 | 360 | 1193 | 0.17 |
| G18 | 0 | 0 | 0 | 0 | 0 | 72 | 10065 | 3822 | 13959 | 1.94 |
| G19 | 0 | 0 | 0 | 0 | 0 | 0 | 3104 | 2033 | 5137 | 0.71 |
| G20 | 0 | 0 | 0 | 0 | 0 | 0 | 2821 | 0 | 2821 | 0.39 |
| G21 | 0 | 0 | 8331 | 0 | 24294 | 15826 | 6396 | 10524 | 65371 | 9.07 |
| G22 | 0 | 0 | 0 | 0 | 271 | 26 | 28 | 140 | 465 | 0.06 |
| HA | 1257 | 2644 | 2540 | 1122 | 768 | 695 | 25753 | 862 | 35641 | 4.94 |
| Q | 0 | 0 | 0 | 0 | 46 | 0 | 112 | 0 | 158 | 0.02 |
| RI | 3720 | 2081 | 780 | 2903 | 2132 | 1519 | 2131 | 1708 | 16974 | 2.35 |
| W | 0 | 51 | 1799 | 0 | 0 | 54 | 297 | 1508 | 3709 | 0.51 |
| v | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 98 | 98 | 0.01 |
| Total | 80243 | 109320 | 155316 | 76646 | 53221 | 57849 | 80451 | 107741 | 720787 | 100.00 |

10. Districtwise distribution of area under different Erosion Intensity Mapping Units

| EIMU | District Area(ha) | | | | | | | | Area(ha) | Area (%) |
|--------------|-------------------|---------------|---------------|--------------|--------------|-----------|-------------|--------------|---------------|---------------|
| | Jalaun | Hamirpur | Jhansi | Chattarpur | Tikamgarh | Gwalior | Datia | Shivpuri | | |
| A01 | 1764 | 2939 | 1098 | 0 | 0 | 0 | 0 | 0 | 5801 | 0.80 |
| A02 | 2068 | 4006 | 291 | 0 | 0 | 0 | 0 | 0 | 6365 | 0.88 |
| A03 | 2010 | 27918 | 2780 | 0 | 0 | 0 | 0 | 0 | 32708 | 4.54 |
| A04 | 4664 | 5814 | 766 | 0 | 0 | 0 | 0 | 0 | 11244 | 1.56 |
| A05 | 10933 | 34435 | 6132 | 0 | 0 | 0 | 0 | 0 | 51500 | 7.14 |
| A06 | 6078 | 7021 | 1448 | 0 | 58 | 0 | 0 | 0 | 14605 | 2.03 |
| A07 | 2504 | 1947 | 290 | 0 | 0 | 0 | 0 | 0 | 4741 | 0.66 |
| A08 | 288 | 6104 | 988 | 0 | 0 | 0 | 0 | 0 | 7380 | 1.02 |
| A09 | 10061 | 59412 | 15755 | 0 | 0 | 0 | 0 | 0 | 85228 | 11.82 |
| A10 | 22 | 0 | 162 | 0 | 0 | 0 | 0 | 0 | 184 | 0.03 |
| A11 | 522 | 1691 | 960 | 0 | 0 | 0 | 0 | 0 | 3173 | 0.44 |
| A12 | 493 | 458 | 0 | 0 | 0 | 0 | 0 | 0 | 951 | 0.13 |
| A13 | 15872 | 87764 | 13760 | 0 | 0 | 0 | 0 | 0 | 117396 | 16.29 |
| G01 | 3265 | 0 | 2600 | 237 | 428 | 0 | 0 | 0 | 3265 | 0.45 |
| G02 | 0 | 2909 | 880 | 71 | 732 | 0 | 0 | 310 | 4902 | 0.68 |
| G03 | 0 | 63 | 1042 | 0 | 2504 | 0 | 0 | 0 | 3609 | 0.50 |
| G04 | 12 | 1629 | 411 | 231 | 1500 | 0 | 0 | 27 | 3810 | 0.53 |
| G05 | 0 | 6605 | 97 | 996 | 0 | 0 | 0 | 0 | 7698 | 1.07 |
| G06 | 0 | 1157 | 0 | 336 | 0 | 0 | 0 | 0 | 1493 | 0.21 |
| G07 | 0 | 0 | 168 | 0 | 164 | 0 | 0 | 0 | 332 | 0.05 |
| G08 | 0 | 0 | 1441 | 0 | 9135 | 0 | 0 | 0 | 10576 | 1.47 |
| G09 | 0 | 15301 | 34 | 3128 | 0 | 0 | 0 | 0 | 18463 | 2.56 |
| G10 | 0 | 0 | 4703 | 0 | 14211 | 0 | 105 | 784 | 19803 | 2.75 |
| G11 | 0 | 4950 | 415 | 67 | 530 | 0 | 0 | 0 | 5962 | 0.83 |
| G12 | 0 | 109 | 2166 | 78 | 250 | 0 | 0 | 0 | 2603 | 0.36 |
| G13 | 0 | 0 | 1597 | 0 | 247 | 0 | 0 | 0 | 1844 | 0.26 |
| G14 | 0 | 62089 | 23170 | 7245 | 36495 | 0 | 559 | 2541 | 132099 | 18.33 |
| G15 | 0 | 625 | 1362 | 0 | 13543 | 0 | 0 | 0 | 15530 | 2.15 |
| G16 | 0 | 52 | 1944 | 0 | 0 | 0 | 0 | 0 | 1996 | 0.28 |
| G17 | 0 | 382 | 681 | 0 | 130 | 0 | 0 | 0 | 1193 | 0.17 |
| G18 | 0 | 0 | 5586 | 0 | 7063 | 0 | 633 | 677 | 13959 | 1.94 |
| G19 | 0 | 0 | 1516 | 0 | 3579 | 0 | 0 | 42 | 5137 | 0.71 |
| G20 | 0 | 0 | 2284 | 0 | 71 | 0 | 314 | 152 | 2821 | 0.39 |
| G21 | 0 | 8141 | 51542 | 190 | 5498 | 0 | 0 | 0 | 65371 | 9.07 |
| G22 | 0 | 0 | 331 | 0 | 134 | 0 | 0 | 0 | 465 | 0.06 |
| HA | 974 | 6669 | 14844 | 101 | 570 | 0 | 1345 | 11138 | 35641 | 4.94 |
| Q | 0 | 0 | 46 | 0 | 112 | 0 | 0 | 0 | 158 | 0.02 |
| Ri | 3185 | 7364 | 3984 | 42 | 2331 | 68 | 0 | 0 | 16974 | 2.35 |
| W | 0 | 1784 | 781 | 66 | 1014 | 0 | 0 | 64 | 3709 | 0.51 |
| v | 0 | 0 | 45 | 0 | 53 | 0 | 0 | 0 | 98 | 0.01 |
| Total | 61450 | 361938 | 165737 | 12979 | 99924 | 68 | 2956 | 15735 | 720787 | 100.00 |

11. State Wise distribution of area under different Erosion Intensity Mapping Units

| Sl.No. | EIMU | UttarPradesh | MadhyaPradesh | Area (ha) | Area(%) |
|--------|------|--------------|---------------|-----------|---------|
| 1 | A01 | 5801 | 0 | 5801 | 0.80% |
| 2 | A02 | 6365 | 0 | 6365 | 0.88% |
| 3 | A03 | 32708 | 0 | 32708 | 4.54% |
| 4 | A04 | 11244 | 0 | 11244 | 1.56% |
| 5 | A05 | 51500 | 0 | 51500 | 7.14% |
| 6 | A06 | 14605 | 0 | 14605 | 2.03% |
| 7 | A07 | 4741 | 0 | 4741 | 0.66% |
| 8 | A08 | 7380 | 0 | 7380 | 1.02% |
| 9 | A09 | 85228 | 0 | 85228 | 11.82% |
| 10 | A10 | 184 | 0 | 184 | 0.03% |
| 11 | A11 | 3173 | 0 | 3173 | 0.44% |
| 12 | A12 | 951 | 0 | 951 | 0.13% |
| 13 | A13 | 117396 | 0 | 117396 | 16.29% |
| 14 | G01 | 2600 | 665 | 3265 | 0.45% |
| 15 | G02 | 3789 | 1113 | 4902 | 0.68% |
| 16 | G03 | 1105 | 2504 | 3609 | 0.50% |
| 17 | G04 | 2052 | 1758 | 3810 | 0.53% |
| 18 | G05 | 6702 | 996 | 7698 | 1.07% |
| 19 | G06 | 1157 | 336 | 1493 | 0.21% |
| 20 | G07 | 168 | 164 | 332 | 0.05% |
| 21 | G08 | 1441 | 9135 | 10576 | 1.47% |
| 22 | G09 | 15335 | 3128 | 18463 | 2.56% |
| 23 | G10 | 4703 | 15100 | 19803 | 2.75% |
| 24 | G11 | 5365 | 597 | 5962 | 0.83% |
| 25 | G12 | 2275 | 328 | 2603 | 0.36% |
| 26 | G13 | 1597 | 247 | 1844 | 0.26% |
| 27 | G14 | 85259 | 46840 | 132099 | 18.33% |
| 28 | G15 | 1987 | 13543 | 15530 | 2.15% |
| 29 | G16 | 1996 | 0 | 1996 | 0.28% |

| Sl.No. | EIMU | UttarPradesh | MadhyaPradesh | Area (ha) | Area(%) |
|--------------------|------|---------------|---------------|---------------|---------------|
| 30 | G17 | 1063 | 130 | 1193 | 0.17% |
| 31 | G18 | 5586 | 8373 | 13959 | 1.94% |
| 32 | G19 | 1516 | 3621 | 5137 | 0.71% |
| 33 | G20 | 2284 | 537 | 2821 | 0.39% |
| 34 | G21 | 59683 | 5688 | 65371 | 9.07% |
| 35 | G22 | 331 | 134 | 465 | 0.06% |
| 36 | HA | 22487 | 13154 | 35641 | 4.94% |
| 37 | Q | 46 | 112 | 158 | 0.02% |
| 38 | RI | 14533 | 2441 | 16974 | 2.35% |
| 39 | W | 2565 | 64 | 3709 | 0.51% |
| 41 | v | 45 | 53 | 98 | 0.01% |
| Grand Total | | 589125 | 131662 | 720787 | 100.00 |

12. Priority Categorization

| Sl.No. | Priority Category | No.of Microwatersheds | Area (ha.) | Area (%) |
|--------------------|---------------------------|--------------------------|---------------|---------------|
| 1 | Very High(1300 and above) | 27 | 16804 | 2.33 |
| 2 | High (1200-1299) | 57 | 38523 | 5.34 |
| 3 | Medium (1100-1199) | 74 | 47930 | 6.65 |
| 4 | Low (1000-1099) | 206 | 147333 | 20.45 |
| 5 | Very Low (Below 1000) | 632 | 470197 | 65.23 |
| Grand Total | | 996 | 720787 | 100.00 |

13. Watershed wise distribution of area under different Priority Categories

| Priority category & range | 2C2A1 | | 2C2A2 | | 2C2A3 | | 2C2A4 | | 2C2A5 | | 2C2A6 | | 2C2A7 | | 2C2A8 | | Grand Total | % Total |
|---------------------------|------------|--------------|------------|---------------|------------|---------------|-----------|--------------|-----------|--------------|-----------|--------------|------------|--------------|------------|---------------|---------------|---------------|
| | No of M/W | Area (ha) | No of M/W | Area (ha) | No of M/W | Area (ha) | No of M/W | Area (ha) | No of M/W | Area (ha) | No of M/W | Area (ha) | No of M/W | Area (ha) | No of M/W | Area (ha) | | |
| Very High (1300 & above) | 5 | 2984 | 11 | 6661 | 1 | 478 | 5 | 4404 | 2 | 1061 | 3 | 1216 | | | | | 16804 | 2.33 |
| High (1200-1299) | 6 | 3793 | 22 | 15315 | 5 | 4293 | 12 | 7699 | 3 | 1767 | 8 | 5032 | 1 | 624 | | | 38523 | 5.34 |
| Medium (1100-1199) | 21 | 13132 | 15 | 11950 | 9 | 5440 | 10 | 7401 | 9 | 4997 | 2 | 810 | 6 | 3046 | 2 | 1154 | 47930 | 6.65 |
| Low (1000-1099) | 27 | 18210 | 13 | 9201 | 69 | 55912 | 15 | 10341 | 9 | 5659 | 12 | 6699 | 17 | 9515 | 44 | 31796 | 147333 | 20.45 |
| Very Low (Below 1000) | 58 | 42124 | 85 | 66193 | 107 | 89193 | 55 | 46801 | 58 | 39737 | 68 | 44092 | 97 | 67266 | 104 | 74791 | 470197 | 65.23 |
| Grand Total | 117 | 80243 | 146 | 109320 | 191 | 155316 | 97 | 76646 | 81 | 53221 | 93 | 57849 | 121 | 80451 | 150 | 107741 | 720787 | 100.00 |

14. Districtwise distribution of area under different Priority Categories

| Priority category & range | Jalaun | | Hamirpur | | Mahoba | | Jhansi | | Chattarpur | | Tikamgarh | | Gwalior | | Datia | | Shivpuri | | Grand Total | | | | | | | | | |
|-----------------------------|-----------|-----------|--------------|------------|-----------|---------------|------------|-----------|---------------|------------|------------|---------------|-----------|-----------|--------------|-----------|-----------|--------------|-------------|-----------|----------|----------|-------------|-----------|-----------|--------------|---------------|--------|
| | No of M/W | Area (ha) | No of M/W | Area (ha) | No of M/W | Area (ha) | No of M/W | Area (ha) | No of M/W | Area (ha) | No of M/W | Area (ha) | No of M/W | Area (ha) | No of M/W | Area (ha) | No of M/W | Area (ha) | | | | | | | | | | |
| | F | P | F | P | F | P | F | P | F | P | F | P | F | P | F | P | F | P | | | | | | | | | | |
| Very High (1300 & above) | 1 | 2 | 1587 | 18 | 2 | 12556 | 2 | 1049 | 4 | 1612 | - | - | - | - | - | - | - | - | 16804 | | | | | | | | | |
| High (1200-1299) | 6 | 3 | 5573 | 38 | 4 | 25254 | 1 | 1 | 2040 | 8 | 5032 | - | - | - | - | - | - | - | 38523 | | | | | | | | | |
| Medium (1100-1199) | 14 | 10 | 13249 | 32 | 11 | 25380 | 5 | 1 | 3516 | 6 | 3823 | - | - | - | 2 | 3 | 1439 | - | 1 | 362 | - | 1 | 161 | 47830 | | | | |
| Low (1000-1099) | 15 | 12 | 15260 | 30 | 17 | 25083 | 57 | 12 | 49741 | 27 | 18 | 20254 | 3 | 7 | 7227 | 29 | 17 | 27739 | - | - | - | 1 | 1 | 810 | - | 2 | 1219 | 147333 |
| Very Low (Below 1000) | 29 | 13 | 25781 | 156 | 17 | 33300 | 93 | 19 | 80329 | 166 | 88 | 135595 | 2 | 15 | 5752 | 47 | 77 | 70157 | - | 1 | 68 | 1 | 2 | 1704 | 19 | 8 | 13731 | 470197 |
| Grand Total | 65 | 40 | 61450 | 274 | 61 | 221273 | 158 | 33 | 140675 | 215 | 107 | 166316 | 5 | 22 | 12979 | 78 | 97 | 99335 | 1 | 68 | 2 | 4 | 2956 | 20 | 11 | 15735 | 720787 | |

F= Full

P=Part

15. State Wise distribution of Priority area

| Priority category & range | Uttar Pradesh | Madhya Pradesh | Area(ha) | Area (%) |
|-----------------------------|---------------|----------------|---------------|---------------|
| Very High (1300 & above) | 16804 | - | 16804 | 2.33 |
| High (1200-1299) | 37899 | 624 | 38523 | 5.34 |
| Medium (1100-1199) | 45968 | 1962 | 47930 | 6.65 |
| Low (1000-1099) | 110338 | 36995 | 147333 | 20.45 |
| Very Low (Below 1000) | 378705 | 91492 | 470197 | 65.23 |
| Total | 589714 | 131073 | 720787 | 100.00 |