

**KANHAR IRRIGATION PROJECT, U.P.**  
**B.C. RATIO CALCULATIONS**

(Rupees in Lacs)

|                                                                                                    | <b>Pre Project</b> | <b>Post Project</b> |
|----------------------------------------------------------------------------------------------------|--------------------|---------------------|
| <b>A. GROSS RECEIPTS</b>                                                                           |                    |                     |
| 1 Gross value of farm produce                                                                      | 3740.77            | 52603.61            |
| 2 Dung receipts (30% of B-2)                                                                       | 168.34             | 1578.11             |
| 3 <b>Total (A) Gross receipts</b>                                                                  | <b>3909.11</b>     | <b>54181.72</b>     |
| <b>B. EXPENSES</b>                                                                                 |                    |                     |
| 1 Expenditure on seeds, manure, fertilizers and hired labour                                       | 1152.86            | 10221.83            |
| 2 Fodder expenses (15% for pre & 10% at post project of A1)                                        | 561.12             | 5260.36             |
| 3 Depreciation (2.7% of A1)                                                                        | 101.00             | 1420.30             |
| 4 Share & Cash rent 5% for pre & 3% for post period of A1)                                         | 187.04             | 1578.11             |
| 5 Land Revenue (2% of A1)                                                                          | 74.82              | 1052.07             |
| <b>Total (B) Expenses</b>                                                                          | <b>2076.84</b>     | <b>19532.67</b>     |
| <b>C. NET VALUE OF FROM PRODUCE</b>                                                                |                    |                     |
| 1 Total Gross Receipts                                                                             | 3909.11            | 54181.72            |
| 2 Total Expenses                                                                                   | 2076.84            | 19532.67            |
| 3 <b>Net Value (1-2)</b>                                                                           | <b>1832.27</b>     | <b>34649.05</b>     |
| <b>D. NET BENEFIT</b>                                                                              |                    |                     |
| 1 Net Value after project                                                                          | 34649.05           |                     |
| 2 Net value before project                                                                         | 1832.27            |                     |
| 3 Loss of agri. Produce due to submergence                                                         | 0.00               |                     |
| 4 <b>Net Annual Agricultural Benefit (1-2-3)</b>                                                   | <b>32816.78</b>    |                     |
| <b>E Net Benefit from fisheries</b>                                                                |                    |                     |
| Spread level of reservoir at FRL=3200ha                                                            |                    |                     |
| Spread level of reservoir at MDDL=2200ha                                                           |                    |                     |
| Average spread Area of reservoir =2700ha.                                                          |                    |                     |
| Net Benefit from fisheries=2700ha.@1.9lacs per hect                                                | <b>5130.00</b>     |                     |
| <b>Net Grand Total Benefit from this project(D+E)</b>                                              | <b>37946.78</b>    |                     |
| <b>E. COST</b>                                                                                     |                    |                     |
| Capital cost of project                                                                            | 225229.22          |                     |
| Cost of land development @ Rs. 20000/ha. For 26075 Ha.                                             | 5215.00            |                     |
| <b>TOTAL COST OF THE PROJECT</b>                                                                   | <b>230444.22</b>   |                     |
| <b>F. ANNUAL COST</b>                                                                              |                    |                     |
| 1 Interest on capital @ 10% of capital cost                                                        | 23044.42           |                     |
| 2 Depreciation of the project @ 1% of the Capital cost (less cost of land development)             | 2252.29            |                     |
| 3 Depreciation of the pumping system 8.33% of the estimated cost (Rs 270.45 lac) of pumping system | 22.53              |                     |
| 4 Depreciation of the rising main @ 3.33% of estimated cost Rs 14.83 lacs assuming lift 30 year    | 0.49               |                     |
| 5 Charge for power for lift irrigation @ Rs. 1900/Ha for 1100                                      | 5.50               |                     |
| 6 Annual operation and maintenance charges @ Rs. 1175/ha for 35467 ha. Area irrigated.             | 416.74             |                     |
| 7 Maintenance of the head works @ 1% (less A ,B ,P Q, X, Y)                                        | 1051.46            |                     |
| <b>TOTAL ANNUAL COST</b>                                                                           | <b>26793.43</b>    |                     |

$$\text{B.C. Ratio} = \frac{37946.78}{26793.43}$$

**1.42**

## KANHAR IRRIGATION PROJECT, UTTAR PRADESH

### SALIENT FEATURE

|   |                                          |             |                                                                                         |
|---|------------------------------------------|-------------|-----------------------------------------------------------------------------------------|
| 1 | Name of the project                      | :-          | KANAHAR IRRIGATION PROJECT                                                              |
| 2 | River Basin                              |             |                                                                                         |
|   | a) Name                                  | :-          | Son Basin                                                                               |
|   | b) Located in                            |             |                                                                                         |
|   | (i) States                               |             | U.P., Bihar, Chhattisgarh and                                                           |
|   | (ii) States (if inter state river)       |             | Jharkhand                                                                               |
|   | (iii) Countries (if International river) |             |                                                                                         |
| 3 | Name of                                  |             |                                                                                         |
|   | a) River                                 | :-          | Kanahar River                                                                           |
|   | b) Tributary                             | :-          | Son River                                                                               |
|   | c) State(s)                              | :-          | U.P., Chhattisgarh and Jharkhand                                                        |
|   | d) District                              |             |                                                                                         |
|   | (i) Reservoir                            | :-          | Sonbhada ( U.P.), Sarguja<br>(Chhattisgarh), Garwa (Jharkhand)                          |
|   | (ii) Head Works                          | :-          | Sonbhadra (U.P.)                                                                        |
|   | (iii) Command area                       | :-          | Sonbhadra (U.P.)                                                                        |
|   | e) Taluka(s) / Tehsil(s)                 | :-          |                                                                                         |
|   | (i) Reservoir                            | :-          | Dudhi ( U.P.), Ramanujgang,<br>Ambikapur (Chhattisgarh), Dhurki,<br>Garhwa, (Jharkhand) |
|   | (ii) Head Works                          | :-          | Dudhi (U.P.)                                                                            |
|   | (iii) Command area                       | :-          | Dudhi, Robertsgang (U.P.)                                                               |
|   | f) Village near the HeadWorks            | :-          | Amwar (U.P.)                                                                            |
| 4 | Location of Head Works                   |             |                                                                                         |
|   | (i) Longitude                            |             | 83°-17' E                                                                               |
|   | (ii) Letitude                            |             | 24°-08' N                                                                               |
| 5 | Project area reference to degree sheets  |             | 63 P/4, P/7, P/8                                                                        |
| 6 | <u>Access to the project</u>             | <u>Name</u> | <u>Distance from<br/>project site</u>                                                   |
|   | (i) Rail Head                            | :-          | Dudhi R. S. 13 Km.                                                                      |
|   | (ii) Road head                           | :-          | Dam site 500 M.                                                                         |

|       |                                                     |        |                                    |                                |
|-------|-----------------------------------------------------|--------|------------------------------------|--------------------------------|
| 7     | Estimated life of the project (Years)               | :-     | 100 Years                          |                                |
| 8     | Type of projects<br>(Irrigation/Multipurpose)       | :-     | Irrigation                         |                                |
| 9     | Irrigation (Ha)                                     |        |                                    |                                |
| a)    | Gross commanded area (GCA)                          | :-     | 37320                              | Ha.                            |
| b)    | Culturable area in U.P. (CCA)                       | :-     | 26075                              | Ha.                            |
| c)    | Area under irrigation (break up)                    |        |                                    |                                |
| (i)   | Kharif                                              | :-     | 21121.00                           | Ha.                            |
| (ii)  | Rabi                                                | :-     | 14342.00                           | Ha.                            |
| (iii) | Gross Irrigated area (GIA) (U.P.)                   | :-     | 35463.00                           | Ha.                            |
| (iv)  | Intensity of irrigation                             | :-     | 136%                               |                                |
| d)    | Cost per hectare of gross area irrigated<br>(U.P.)  | :- Rs. | 635110.47 /Ha.                     |                                |
| e)    | Cost per 1000 Cum. Of gross/live storage            | :-     | 29237/53443                        |                                |
| 10    | Water Supply (Domestic)                             |        |                                    |                                |
| a)    | Names of town / Village served                      | :-     | Dudhi, Bagharu                     |                                |
| b)    | Size if population served                           | :-     | More than 2.0 Lacs                 |                                |
| c)    | Quantum of water made available                     | :-     | 1000 Cum.                          |                                |
| d)    | Quantum of water per capita (liter)/day             | :-     | 400                                |                                |
| 11    | Quantum of water for industrial use                 | :-     | Nil.                               |                                |
| 12    | <u>Project performance</u>                          |        | <u>Period</u><br><u>Simulation</u> | <u>No of</u><br><u>failure</u> |
|       | Irrigation                                          | :-     | 28                                 | 4                              |
| 13    | Catchments area at headwork site (Km <sup>2</sup> ) |        |                                    |                                |
| a)    | Gross                                               | :-     | 4584                               |                                |
| b)    | Intercepted (by contemplates project)               | :-     | 3064                               |                                |
| c)    | Unintercepted                                       | :-     | 1520                               |                                |
| 14    | Precipitation                                       |        | Rainfall (weighted mm)             |                                |
|       | Catchment period of record 1961-2011                |        | Monsoon (June - Oct.)              |                                |
| a)    | Average                                             |        | 3590                               |                                |
| b)    | Maximum                                             |        | 6180                               |                                |
| c)    | Minimum                                             |        | 11.1                               |                                |
| d)    | Coefficient of variation                            |        | 1.043                              |                                |

| 15 | Command                                                                            | Cropping Season      |                   |                             |
|----|------------------------------------------------------------------------------------|----------------------|-------------------|-----------------------------|
|    |                                                                                    | Kharif<br>(June-Oct) | Rabi<br>(Nov-Feb) | Hot<br>weather<br>(Mar-May) |
| a) | Average                                                                            | :- 841               | 30                | 34                          |
| b) | 80 Percent dependable                                                              | :- 669               | 19                | 8                           |
| 16 | Annual yield calculated at ahe proposed site<br>(M cum) period of record 1976-2004 | (June-Oct)           |                   |                             |
| a) | Maximum                                                                            | :- 4723              |                   |                             |
| b) | Minimum                                                                            | :- 598               |                   |                             |
| c) | Average                                                                            | :- 2105              |                   |                             |
| d) | Dependable (percent)                                                               | Mansoon (June-Oct)   |                   |                             |
|    | (i) 50                                                                             | :- 1525              |                   |                             |
|    | (ii) 75                                                                            | :- 1218              |                   |                             |
|    | (iii) 90                                                                           | :- 1101              |                   |                             |
|    | (iv) 98                                                                            | :- 598               |                   |                             |
| 17 | Utilization with in the state (Mcum)                                               | :-                   |                   |                             |
| 18 | State share in case of interstate                                                  | :- Nil               |                   |                             |
| 19 | Committed utilization                                                              |                      |                   |                             |
| a) | Up stream major medium minor                                                       |                      |                   |                             |
|    | (i) Project completed                                                              | :- Nil               |                   |                             |
|    | (ii) Project under construction                                                    | :- Nil               |                   |                             |
|    | (iii) Further project                                                              | :- Nil               |                   |                             |
|    | (iv) Any others                                                                    | :- Nil               |                   |                             |
| b) | Down streame major medium minor                                                    |                      |                   |                             |
|    | (i) Project completed                                                              | :- Nil               |                   |                             |
|    | (ii) Project under construction                                                    | :- Nil               |                   |                             |
|    | (iii) Further project                                                              | :- 123               |                   |                             |
|    | (iv) Any others                                                                    | Nil                  |                   |                             |
| 20 | Proposed utilization by the project                                                |                      |                   |                             |
| a) | Kharif                                                                             | :- 81                |                   |                             |
| b) | Rabi                                                                               | :- 55                |                   |                             |
| c) | Total                                                                              | :- 136               |                   |                             |

|           |                                                                      |                             |
|-----------|----------------------------------------------------------------------|-----------------------------|
| <b>21</b> | <b>Reservoir Water Level (El-m)</b>                                  |                             |
| a)        | Maximum water level                                                  | :- 267.920                  |
| b)        | Full reservoir level                                                 | :- 265.552                  |
| c)        | Minimum draw down level                                              | :- 260.212                  |
| d)        | Dead storage level                                                   | :- 260.212                  |
| <b>22</b> | <b>Free board (m)</b>                                                | :- 3.00                     |
| <b>23</b> | <b>Wave height (m)</b>                                               | :- 2.00                     |
| <b>24</b> | <b>Live storage (Mcum)</b>                                           | :- 122.11                   |
| <b>25</b> | <b>Capacity at (Mcum)</b>                                            |                             |
| a)        | Full reservoir level                                                 | :- 223.21                   |
| b)        | Minimum draw down level                                              | :- 101.10                   |
| c)        | Dead storage level                                                   | :- 101.10                   |
| <b>26</b> | <b>Sedimentation (Mcum)</b>                                          | :- After 50 year            |
| a)        | Above MDDL                                                           | :- 10.40                    |
| b)        | Below MDDL                                                           | :- 88.90                    |
| c)        | Encroachment of live storage (Percent)                               | :- 8.50%                    |
| <b>27</b> | <b>Assumed annual losses evaporation from the reservoir (Mcum)</b>   | :- 24.70                    |
| <b>28</b> | <b>Land and property submerged</b>                                   |                             |
| a)        | Village affected (Nos)                                               | :- 19                       |
| b)        | Land affected (Ha.)                                                  |                             |
| (i)       | Gross                                                                | :- 4088.13                  |
| (ii)      | Culturable                                                           | :- 1747.97                  |
| (iii)     | Irrigated                                                            | :- Nil                      |
| c)        | Building/house (no.)                                                 |                             |
| (i)       | Private                                                              | :- 1018                     |
| (ii)      | Communities                                                          | :- 10                       |
| d)        | Well (no.)                                                           | :- 224 (Kuchcha), 41(pukka) |
| <b>29</b> | <b>Submergence ratio (with reference to culturable) command area</b> | :- 0.067                    |
| <b>30</b> | <b>Number of families affected</b>                                   | :- 2278                     |
| <b>31</b> | <b>Headworks</b>                                                     | :-                          |

**32 Dam**

**33 Type of dam**

- |                                                                                                                                  |    |                               |
|----------------------------------------------------------------------------------------------------------------------------------|----|-------------------------------|
| a) Homogenous/zoned/Rockfill                                                                                                     | :- | Homogenous zoned in river gap |
| b) Length of the dam at top (m)                                                                                                  |    |                               |
| (i) Right flank                                                                                                                  | :- | 1240                          |
| (ii) Left flank                                                                                                                  | :- | 1749                          |
| c) Top width (m)                                                                                                                 | :- | 9.16                          |
| d) Maximum height above G.L.(m)                                                                                                  |    |                               |
| (i) Right flank                                                                                                                  | :- | 39.9                          |
| (ii) Left flank                                                                                                                  | :- | 39.5                          |
| e) Type of cutoff and maximum depth<br>(Upstreame blanket/open trench/<br>diaphragm /Groutcurtain/combination of<br>alternative) | :- | Combination of alternative    |

**34 Spillway (Overflow section)**

- |                                                        |    |                                  |
|--------------------------------------------------------|----|----------------------------------|
| a) Type of spillway                                    | :- | Ogee                             |
| b) Full reservoir level (El-m)                         | :- | 265.552                          |
| c) Maximum water level (El-m)                          | :- | 267.920                          |
| d) Length                                              | :- | 311.750                          |
| e) Maximum height above the deepest<br>foundation      | :- | 28.802                           |
| f) Crest level (El-m)                                  | :- | 251.302                          |
| g) Number of gates                                     | :- | 16                               |
| h) Type of gate                                        | :- | Radial                           |
| i) Size of gates (m)                                   | :- | 15.5 x 14.5 m.                   |
| j) Maximum discharging capacity at F.R.L.and<br>M.W.L. | :- | 29,148 cumec ( 10.29 Lac. cusec) |
| k) Flood height (m)                                    | :- | 2.368                            |
| l) Tail water level (El-m)                             |    |                                  |
| i) Maximum                                             | :- | 233.800                          |
| ii) Minimum                                            | :- | 229.000                          |
| m) Type of energy dissipation arrangement              | :- | Ski jump Bucket                  |

**35 Main canal**

- |    |                         |
|----|-------------------------|
| :- | Left Kanhar Canal       |
| :- | Right Kanhar Canal      |
| :- | Left Pandu Basin Canal  |
| :- | Right Pandu Basin Canal |

**36 Purpose of canal**

- |    |            |
|----|------------|
| :- | Irrigation |
|----|------------|

37 Type

- a) Flow/Lift :- Flow
- b) Lined-unlined : Lined (Partially)
- c) Discharging capacity of channel above which :- whole length
- d) Type of lining :- Concrete

38 Main canal data

|                                                              |    | <u>LKC</u> | <u>RKC</u> | <u>LPBC</u> | <u>RPBC</u> |
|--------------------------------------------------------------|----|------------|------------|-------------|-------------|
| a) Length (Km)                                               | :- | 25.60      | 31.50      | 29.10       | 24.00       |
| b) Full supply level at head (El-m)                          | :- | 260.00     | 260.00     | 252.30      | 252.68      |
| c) Full supply depth at head (m)                             | :- | 1.75       | 1.75       | 1.60        | 1.89        |
| d) Bed width at head (m)                                     | :- | 1.50       | 5.20       | 2.00        | 3.00        |
| e) Side slope at head                                        | :- | 1.5:1      | 1.5:1      | 1.5:1       | 1.5:1       |
| f) Bed slope                                                 | :- | 0.2m/Km    | 0.2m/Km    | 0.2m/Km     | 0.2m/Km     |
| g) Maximum discharge capacity at head                        | :- | 4.80       | 18.00      | 4.80        | 9.20        |
| h) Total number of canal structures on main and branch canal | :- | 56         | 46         | 48          | 42          |
| i) Gross command area (ha) in U.P                            | :- | 37320      |            |             |             |
| j) culturable command area (ha) U.P                          | :- | 26075      |            |             |             |
| j) culturable command area (ha) Jharkhand                    | :- | 7000       |            |             |             |

39 Branch canal(s) :- Flow canal

- a) Numbers :- Two
- b) Total length (Km) :- 57.10

40 Total length of distribution system :- 190 Km

41 Name of Crop (Season wise)

Percentage Area (CCA)

| <u>Kharif</u>  |    | <u>Existing</u> | <u>Proposed</u> |
|----------------|----|-----------------|-----------------|
| 1) Paddy       | :- | 11.80           | 25.00           |
| 2) Maize       | :- | 8.80            | 15.00           |
| 3) Arhar       | :- | 5.60            | 5.00            |
| 4) Pulse (Urd) | :- | 1.20            | 20.00           |
| 5) Ground nut  | :- | -               | 4.00            |
| 6) Tomato      | :- | -               | 5.00            |
| 7) Onion       | :- | -               | 7.00            |
| 8) Jwar        | :- | 1.70            | -               |

|                  |    |       |   |
|------------------|----|-------|---|
| 9) Kodo Sanwan   | :- | 11.80 | - |
| 10) Til          | :- | 4.30  | - |
| 11) Other Kharif | :- | 0.30  | - |

Rabi

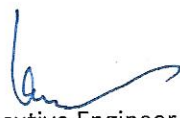
|            |    |      |       |
|------------|----|------|-------|
| 1) Wheat   | :- | 3.90 | 15.00 |
| 2) Gram    | :- | 4.90 | 5.00  |
| 3) Mustard | :- | 2.00 | 4.00  |
| 4) Potato  | :- | -    | 5.00  |
| 5) Peas    | :- | -    | 23.00 |
| 6) Tomato  | :- | -    | 1.00  |
| 7) Onion   | :- | -    | 1.00  |

42 Cost of the Project :- Rs. 223934.64 Lacs.

Unit I- Headwork :- Rs. 141341.33 Lacs.

Unit II- Main Canal & Branches :- Rs. 82593.31 Lacs.

|                          | Quantity<br>(M.T.) | Value<br>(Rs. Lakhs) | Revenue<br>(Rs. Lakhs) |
|--------------------------|--------------------|----------------------|------------------------|
| 43 Food production (Ton) | :- 3519832.00      | 8764.85              | 56.58                  |
| 44 Benefit cost ratio    | :- 1.42:1          |                      |                        |

  
Executive Engineer  
Kanhra Construction Division-I  
Pipri, Sonebhadra