CHAPTER II

RESEARCH METHODOLOGY

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CHAPTER II

RESEARCH METHODOLOGY

The supply of land being inelastic, the scope for extensive cultivation is very limited in India. In the context of increasing agricultural production, therefore, efforts must be made to locate the areas where agricultural productivity is very low at present and attempts must be concentrated on increasing it.

The importance of minor irrigation works such as irrigation tanks, in augmenting food production has already been discussed. They have been the backbone of agriculture in most of the states in the country. In Madhya Pradesh too, tanks have been the traditional source of irrigation. Though, in recent years, the proportion of tank irrigated area has declined, the tanks still occupy an important place in the agricultural economy of the state, especially in the backward areas like Bastar district. In the regions where construction of big dams and canals poses problems due to geographical situations and the ground water is either insufficient for irrigation or prohibitive due to rocky bed, tank irrigation is looked upon as an essential

1. The proportion of tank irrigated area to total irrigated area has declined to 5.8% in 1980-81 as compared to 14.4% in 1955-56.
tool for agricultural development.

In 1984, out of 217 completed irrigation schemes, as many as 161 were irrigation tanks in Bastar district. Out of 70 on-going schemes, 47 were tank schemes; and, out of 38 proposed schemes as many as 36 were tank schemes for which an outlay of Rs. 2821.44 lakhs had been proposed.

It is evident from the foregoing description that irrigation tanks are, and will continue to be, the prominent source of irrigation in Bastar district. But the available data regarding the utilisation of the created irrigation potential reveal that the Bastar cultivators show a degree of reluctance to utilize irrigation in normal years. In a situation where a huge proportion of the available fund is being diverted to construct minor irrigation tanks, and the government are so anxious for the economic upliftment of tribal people, the questions which may often confront the policy makers are—How far have these tanks benefitted the cultivators? What are the constraints in full utilization of the created potential? Have the cropping pattern and farming practices changed in positive direction due to irrigation? What is the impact of tank irrigation on input-mix and crop production? Are these tank projects economically worthwhile and viable? Precise and logical answers of these questions are possible only when the field study of the served area is undertaken. Hence, the present study.
2.1 OBJECTIVE OF THE STUDY

The various objectives of the present study are:

(i) to assess the extent and reasons of under utilisation of tank irrigation and suggest remedies there-of;

(ii) to measure the impact of tank irrigation on yield level, cost of cultivation, farm business income, cropping pattern, intensity of cropping, employment and adoption of modern agricultural techniques;

(iii) to work out the benefit-cost ratio of irrigation tanks, and

(iv) to pin-point the problems related with the management of tank irrigation.

2.2 SCOPE AND COVERAGE

The study is confined to only one source of irrigation, namely irrigation tanks. The tanks constructed and maintained by the Irrigation Department of Madhya Pradesh Government are the subject matter of this study. The tanks constructed and/or maintained by other agencies are outside the scope of this study.

For the purpose of an in-depth study, primary data have been collected from 95 beneficiaries and 50 non-beneficiaries. The reference year for the purpose of primary data is 1984-85, though at relevant places data have been collected for the previous years as well.
2.3 **THE APPROACH**

Conventionally, there are two approaches followed to measure the impact of irrigation and for economic evaluation of the irrigation projects. The first is 'before and after approach.' In this approach cost of cultivation and production prior to and after the introduction of irrigation is compared to find out the net additional production due to irrigation. This approach is more suited to the newly constructed irrigation schemes, as the respondents can easily recall the cost and production before irrigation. Further, this approach ignores the improvements that may be expected to occur in the same time without the project due to increased use of other inputs and improvement in dry farming technology.

An alternative approach is 'with and without approach.' Here, cost and production are worked out separately for the irrigated and dry farming in the same tract. The difference is attributed to irrigation because the technological improvements and the modern inputs are available to both the groups of cultivators.

Obviously, the later is a superior method and

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the present study is also based on the data collected from the two groups of cultivators—with tank irrigation and without tank irrigation.

2.4 CONCEPTS AND DEFINITIONS

(A) Classification of Tanks:

All the tanks in Bastar district are minor irrigation tanks. However, for selecting a representative sample they have been classified into three categories according to their gross irrigation potential as under:

- **Large Tank**: Gross irrigation potential of more than 100 hectares.
- **Medium Tank**: Gross irrigation potential between 41 to 100 hectares.
- **Small Tank**: Gross irrigation potential up to 40 hectares.

Most of the small tanks have been handed over to Janpads for maintenance. In Charama block of Kanker tahsil seven tanks of 41 hectares each, have also been handed over to Janpads. These tanks, therefore, are included in the category of small tanks.

(B) House-hold:

A cultivator house-hold is one who has engaged in cultivation of a piece of owned or leased-in land;
how-so-ever small. The terms house-hold, farmer, culti-
vator and respondent are interchangeable in the present
work.

(C) Gross Receipts:

The term gross receipts has been used in
restricted sense in the present study. It implies the
value of output, inclusive of by-product in paddy cultivation
at village prices.

(D) Cost of Cultivation:

While computing the cost of cultivation, the
variable cost only has been taken into account. Thus the
cost of cultivation includes expenditure on seeds, manures,
fertilizers, pesticides and insecticides, irrigation
charges, agricultural implements, human labour and bullock
labour. The land revenue has not been taken into account
as it occupies a very negligible proportion of the cost
structure. The interest on working capital, also, has not
been included because wages occupy the major proportion in
cost structure, and in tribal economy wages for different
agricultural operations are paid in kind after the harvest
season is over. Inclusion of interest on working capital,
in this condition, would have resulted in over estimation
of cost.
The following procedure was adopted to compute various cost components:

(i) The farm produced seeds were evaluated at prevailing village prices, whereas the purchased seeds were valued at their actual prices.

(ii) The farm produced manures as well as the purchased manures were evaluated at prevailing village prices.

(iii) The fertilizers, whether purchased or received free of cost from the extension staff were valued at their market prices.

(iv) The pesticides (including insecticides) were valued at their prevailing market prices.

(v) Irrigation charges include water charges and irrigation cess irrespective of the subsidy involved in it.

(vi) Expenditure on agricultural implements implies to 'Jewar'. Customarily the tribal cultivators give a part of the produce to village artisans towards the year-round maintenance of their agricultural implements. This payment is known as 'Jewar.' By dividing 'Jewar' by the size of holding the per hectare expenditure was worked out.

(vii) Human labour includes family labour, attached labour and hired labour. The evaluation of all these was done on the basis of prevailing wage rates in the village, whether paid in cash or in kind.
(viii) The bullock labour means a pair of draft animals, owned or hired, used for agricultural purposes. It was evaluated at the prevailing hiring rates in the village.

(ix) In many parts of the district, especially in South Bastar, the agricultural work is done only for 2 to 3 hours a day. Necessary adjustments, for computing the number of days involved in any operation, were made in such cases.

(E) Farm Business Income

The concept of farm business income implies gross receipts minus cost of cultivation. Thus, it is the net value of the produce.

2.5 SIZE OF SAMPLE

A large sample is always preferred for its representativeness and adequacy for working out various statistical tests of significance. However, an individual research worker has his own limitations regarding time and resources. He has to select such a sample which is not only representative but manageable too. Keeping this in view, it was decided to select 10 irrigation tanks for in-depth study. Further, 10 beneficiary house-holds and 5 non-beneficiary house-holds were to be selected from each tank for collecting primary data.
2.6 **SAMPLING DESIGN**

A multi-stage stratified sampling design was adopted. House-hold was the sampling unit and it was selected in the third stage. The three stages were:

First Stage: Selection of tank
Second Stage: Selection of village
Third Stage: Selection of house-hold.

2.7 **SELECTION PROCEDURE**

(i) **Selection of Tanks**

It was decided to select at least one tank from each tahsil. There were eight talsils in the district before 1982. In 1982, three new talsils namely Charana, Antagarh and Bhopalpattanam were inaugurated. But as the Irrigation Department had maintained all the records in old pattern of eight talsils, the same was followed for the present study also.

There were 161 completed tank irrigation schemes in 1984. Out of this, 69 were large tanks, 57 medium tanks and 35 were small tanks. The talsil-wise distribution of these tanks with their designed irrigation potential has been presented in annexure 2.1.
Since the Irrigation Department acts with the assumption that normally it takes three years for the full development of tank irrigation, the tanks completed after 1981 were deleted from the list. Small tanks were constructed mainly as relief works, and most of them have been handed over to Janpads for maintenance. The project reports and other relevant records of these tanks were not easily traceable. Hence these 35 tanks were also dropped from the list. Thus 10 tanks were selected out of 84 tanks of the remaining two categories presented in Table 2.1.

It was decided to select equal number of tanks from either category. One tank from each tahsil was selected keeping in view the prominence of the category in that tahsil. It is evident from the Table 2.1 that Kanker tahsil has maximum number of irrigation tanks, followed by Jagdalpur. To assign weights to these tahsils, two tanks were selected from each of them. Thus, 10 tanks were selected in the manner presented in Table 2.2.

(ii) Selection of Villages:

The villages actually irrigated by the selected tanks during the reference year were selected. Irrigation by tank is generally confined to one or two villages only. Among the selected tanks, only Bhupalpattanam tank had irrigated seven villages. Hence a larger number of villages were selected from this tank. It is indicated in Table 2.3.
TABLE 2.1
IRRIGATION TANKS AND THEIR IRRIGATION POTENTIAL, BASTAR DISTRICT
1981

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Tahsil</th>
<th>Number of Irrigation Tanks</th>
<th>Designed Potential (Hectares)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Large Tank</td>
<td>Medium Tank</td>
</tr>
<tr>
<td>1</td>
<td>Kanker</td>
<td>9 7 17</td>
<td>33</td>
</tr>
<tr>
<td>2</td>
<td>Bhunjupratappur</td>
<td>2 5 2</td>
<td>9</td>
</tr>
<tr>
<td>3</td>
<td>Narayanpur</td>
<td>4 4 3</td>
<td>11</td>
</tr>
<tr>
<td>4</td>
<td>Kondagaon</td>
<td>2 10 5</td>
<td>17</td>
</tr>
<tr>
<td>5</td>
<td>Jagdalpur</td>
<td>7 9 4</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Dantewada</td>
<td>3 6 3</td>
<td>12</td>
</tr>
<tr>
<td>7</td>
<td>Konta</td>
<td>2 7 1</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Bijapur</td>
<td>4 3 -</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td></td>
<td>33 51 35</td>
<td>119</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: The bracketed figures indicate additional potential in Rabi season.

Source: Superintending Engineer, Irrigation Circle, Jagdalpur (M.P.)
LOCATION OF SAMPLE TANKS

INDEX

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® TANKS

TANKS
1. SIRSIDA
2. SIHARINALLA
3. JANAKPUR
4. BAKULWAHI
5. SURDONGER
6. CHHINDGAON
7. CHITRAKOTE
8. DEGALRAS
9. RAMARAM
10. BHOPALPATTANAM

FIG. 2
TABLE 2.2

SELECTION OF TANKS

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Tahsil</th>
<th>Number of Selected Tank</th>
<th>Name of Tank, Selected</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Kanker</td>
<td>2</td>
<td>Siharinalla</td>
<td>large</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Sirsida</td>
<td>large</td>
</tr>
<tr>
<td>2.</td>
<td>Bhanupratappur</td>
<td>1</td>
<td>Janakpur</td>
<td>medium</td>
</tr>
<tr>
<td>3.</td>
<td>Narayanpur</td>
<td>1</td>
<td>Bakulwahi</td>
<td>large</td>
</tr>
<tr>
<td>4.</td>
<td>Kondagason</td>
<td>1</td>
<td>Surdunger</td>
<td>medium</td>
</tr>
<tr>
<td>5.</td>
<td>Jagdalpur</td>
<td>2</td>
<td>Chitrakote</td>
<td>large</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Chhindgaon</td>
<td>medium</td>
</tr>
<tr>
<td>6.</td>
<td>Dantewada</td>
<td>1</td>
<td>Degalras</td>
<td>medium</td>
</tr>
<tr>
<td>7.</td>
<td>Kota</td>
<td>1</td>
<td>Ramaram</td>
<td>medium</td>
</tr>
<tr>
<td>8.</td>
<td>Bijapur</td>
<td>1</td>
<td>Bhopalpattanam</td>
<td>large</td>
</tr>
</tbody>
</table>

(iii) Selection of House-Holds:

After selecting the tanks and villages a complete listing of the house-holds, whose holdings were commanded by the tanks, was done with the help of the records of the Irrigation Department. The cultivators who had not availed irrigation facility during the reference year were dropped from the list. From the list of user cultivators 10 house-holds were selected.
## TABLE 2.3

**SELECTION OF VILLAGES**

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Tank Size</th>
<th>Name of Sample Tank</th>
<th>Irrigation Potential (Hect)</th>
<th>Villages Commanded</th>
<th>Villages irrigated in 1984-85</th>
<th>Villages selected</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Kharif</td>
<td>Rabi</td>
<td>Total</td>
<td></td>
</tr>
<tr>
<td>1.</td>
<td>Large</td>
<td>Siharinalla</td>
<td>259</td>
<td>-</td>
<td>259</td>
<td>Siharinalla, Dargahan</td>
</tr>
<tr>
<td>2.</td>
<td>Large</td>
<td>Sirsida</td>
<td>164</td>
<td>-</td>
<td>164</td>
<td>Sirsida, Dargahan</td>
</tr>
<tr>
<td>3.</td>
<td>Large</td>
<td>Bakulwahi</td>
<td>172</td>
<td>-</td>
<td>172</td>
<td>Bakulwahi, Sakaribeda</td>
</tr>
<tr>
<td>4.</td>
<td>Large</td>
<td>Bhopalpattanam</td>
<td>309</td>
<td>-</td>
<td>309</td>
<td>Bhopalpattanam, Gotaiguda</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Gotaiguda, Gotaiguda</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Gotaiguda, Gotaiguda</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Gotaiguda, Gotaiguda</td>
</tr>
<tr>
<td>5.</td>
<td>Large</td>
<td>Chitrakote</td>
<td>162</td>
<td>44</td>
<td>206</td>
<td>Chitrakote</td>
</tr>
<tr>
<td>6.</td>
<td>Medium</td>
<td>Janakpur</td>
<td>71</td>
<td>-</td>
<td>71</td>
<td>Janakpur</td>
</tr>
<tr>
<td>7.</td>
<td>Medium</td>
<td>Surdonger</td>
<td>94</td>
<td>-</td>
<td>94</td>
<td>Surdonger, Keskal</td>
</tr>
<tr>
<td>8.</td>
<td>Medium</td>
<td>Ramaram</td>
<td>70</td>
<td>-</td>
<td>70</td>
<td>Ramaram</td>
</tr>
<tr>
<td>9.</td>
<td>Medium</td>
<td>Degalras</td>
<td>53</td>
<td>-</td>
<td>53</td>
<td>Degalras</td>
</tr>
<tr>
<td>10.</td>
<td>Medium</td>
<td>Chhindgaon</td>
<td>89</td>
<td>-</td>
<td>89</td>
<td>Chhindgaon, Kumhali</td>
</tr>
</tbody>
</table>
at random. In Degalras tank, there were only 5 user farmers and all of them were selected. Thus out of 622 user households under the sample tanks, 95 were selected. In addition to the beneficiary house-holds, 5 non-beneficiary house-holds were also selected in each tank from the same or the adjacent village for the purpose of comparison. The former group has been named 'project group' while the latter has been termed 'control group' in this study (Table 2.4).

TABLE 2.4

SELECTION PROCEDURE OF SAMPLE HOUSEHOLD

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Sample Tank</th>
<th>Total Number of households in the command</th>
<th>Actual users in 1984-85</th>
<th>No. of selected Beneficiary</th>
<th>No. of selected Non-beneficiary</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Siharinalla</td>
<td>78</td>
<td>15</td>
<td>10</td>
<td>5</td>
</tr>
<tr>
<td>2</td>
<td>Sirsida</td>
<td>139</td>
<td>122</td>
<td>10</td>
<td>5</td>
</tr>
<tr>
<td>3</td>
<td>Bakulwahi</td>
<td>96</td>
<td>96</td>
<td>10</td>
<td>5</td>
</tr>
<tr>
<td>4</td>
<td>Bhopalpattanam</td>
<td>250</td>
<td>210</td>
<td>10</td>
<td>5</td>
</tr>
<tr>
<td>5</td>
<td>Chitrakote</td>
<td>64</td>
<td>64</td>
<td>10</td>
<td>5</td>
</tr>
<tr>
<td>6</td>
<td>Janakpur</td>
<td>23</td>
<td>23</td>
<td>10</td>
<td>5</td>
</tr>
<tr>
<td>7</td>
<td>Surdungar</td>
<td>57</td>
<td>26</td>
<td>10</td>
<td>5</td>
</tr>
<tr>
<td>8</td>
<td>Ramaram</td>
<td>35</td>
<td>21</td>
<td>10</td>
<td>5</td>
</tr>
<tr>
<td>9</td>
<td>Degalras</td>
<td>20</td>
<td>05</td>
<td>05</td>
<td>5</td>
</tr>
<tr>
<td>10</td>
<td>Chhindgaon</td>
<td>57</td>
<td>40</td>
<td>10</td>
<td>5</td>
</tr>
</tbody>
</table>

Total 819 622 95 50
2.9 THE SCHEDULE

To collect the required data for the study, direct interview method, with the help of two structured schedules, viz; 'Tank Schedule' and 'Household Schedule', was adopted. 'Tank Schedule' was used to collect information regarding the tank, such as salient features of the tank, irrigation use, revenue collection, state of maintenance etc. This schedule was filled-in with the help of project reports and relevant information provided by the Irrigation Department.

'The Household Schedule' was used to collect information regarding land use, cropping pattern, input mix, output received, irrigation use and the views regarding the present irrigation system and modern inputs from the sample households.

The information were collected by interviewing the households directly after reaching a rapport with them. The task was not easy as the respondents were rather shy and to elicit the required detailed information from them was often very tiring, and required all the skills of a good investigator. The information received from the respondents was cross checked through village patwari or some knowledgeable person in the village.
As the tank irrigation is used mainly for paddy crop in Kharif season only, the comparison of the economies is related to the paddy crop only. Further, paddy is sown either by transplanting method or by broadcasting method. But the former method occupied only a negligible acreage in the project group economy while in the control group it was totally absent. Hence, while comparing both the economies, only the respondents using broadcasting method were taken into account. Since most of the holdings in the present group were partially irrigated, only their irrigated part was considered for comparison with the control group economy. (Annexure 2.2).

For testing the significance of difference in the means of two sample groups, 't' test was used and the null hypothesis was tested at 1 percent and 5 percent level of significance.

For calculating Benefit Cost Ratio of the tank projects, sophisticated modern techniques could not be used due to lack of reliable data. The ratio was worked out on the basis of annual costs and benefits. The format suggested by the Irrigation Commission for calculating Benefit Cost Ratio was used with certain modifications. (Annexure 2.3).

2.10 **LIMITATIONS OF THE STUDY**

The study relates to minor irrigation tanks which have been constructed and maintained by the Irrigation Department. It does not take account of the tanks constructed by 'Dandakaranya Development Authority' or any other agency.

Very small tanks, which are generally maintained by the Janpads, are also outside the purview of this study.

The collected data pertain to one agricultural season only, while the variations in output from year to year are very common in agriculture due to vagaries of nature. As is common everywhere in India, the Bastar cultivators also do not maintain account of their farming operations. The analysis is based on the information given by the households. The accuracy of such data is subject to the limitations of the memory of the farmers.

As the tank water is used for paddy crop only, the input-output data for other crops have not been taken into account.

There may be factors other than irrigation responsible for the difference in both the economies, but in the present study it has been assumed that the difference is due to irrigation only.
These limitations of the study should be kept in view while making and implementing any policy based on the findings of this study.

2.11 CHAPTER SCHEME

The thesis is presented in seven chapters. After giving a general introduction of irrigation in the first chapter, the second chapter is devoted to the research methodology. An economic and geographical profile of Bastar district has been given in the third chapter. Chapter four deals with the problem of under-utilisation of irrigation potential. The impact of tank irrigation on yield, cost, cropping pattern, intensity of cropping, employment and farm business income has been examined in the fifth chapter. This chapter also contains Benefit Cost Analysis of tank irrigation. Chapter six is associated with the problems of management of tank irrigation. The last chapter is a resume and indicates the policy implications emerging out of the study.

2.12 SALIENT FEATURES OF THE SAMPLE TANKS

Though all the sample tanks are minor irrigation tanks, there are differences with regard to their life, ayacut and remoteness etc. The salient features of the tanks presented in table 2.5 revealed that Janakpur tank is
### TABLE 2.5

**SALIENT FEATURES OF THE SAMPLE TANKS**

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Name of Tank</th>
<th>Tahsil</th>
<th>Distance from Tahsil headquarters in km</th>
<th>Year of commencement</th>
<th>Year of completion</th>
<th>Cost of Construction (Rs. Lakh)</th>
<th>Estimated Live storage area (Sq.Km.)</th>
<th>Final Live storage area (Milion feet³)</th>
<th>No. of sluice gates</th>
<th>Designed Irrigable Area (Hect.)</th>
<th>Per Hectare cost of construction (Rs)</th>
<th>Per Hectare Kharif Rabi Total Price (Rs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Siharinalla</td>
<td>Kaniker</td>
<td>30</td>
<td>1976</td>
<td>1979</td>
<td>19.03</td>
<td>9.060</td>
<td>24,582</td>
<td>1</td>
<td>259</td>
<td>-</td>
<td>259</td>
</tr>
<tr>
<td>2</td>
<td>Sirsida</td>
<td>Kaniker</td>
<td>27</td>
<td>1964</td>
<td>1969</td>
<td>1.85</td>
<td>3.626</td>
<td>16,633</td>
<td>2</td>
<td>164</td>
<td>-</td>
<td>164</td>
</tr>
<tr>
<td>3</td>
<td>Bakulwahi</td>
<td>Narayanpur</td>
<td>6</td>
<td>1975</td>
<td>1980</td>
<td>3.07</td>
<td>2.072</td>
<td>18,440</td>
<td>2</td>
<td>172</td>
<td>-</td>
<td>172</td>
</tr>
<tr>
<td>5</td>
<td>Chitrakote</td>
<td>Jagdalpur</td>
<td>35</td>
<td>1976</td>
<td>1981</td>
<td>4.80</td>
<td>2.926</td>
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<td>7</td>
<td>Surdonger</td>
<td>Kondagaon</td>
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<td>1976</td>
<td>1981</td>
<td>3.27</td>
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<td>7.810</td>
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**Note:**
- **A** - Irrigable area in round figures only
- **B** - Worked out on the basis of irrigable area in the project report
- **C** - Includes Rs. 5,500,00 spent on catchment area
- **D** - Includes Rs. 1,11,683 incurred by the Development Block.
the oldest among the sample tanks while Chitrakote and Surdonger are the most recent ones. Bhopalpattanam has the largest ayacut while Degalras tank serves the smallest ayacut. Chitrakote tank has some designed irrigation potential to irrigate in rabi season also while the rest of the tanks are technically designed to irrigate in kharif season only. The per hectare cost on 1984 prices is lowest in case of Bakulwahi tank and highest in case of Siharinalla tank.