**CONTENTS**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Achievements of Irrigation in Maharashtra State</td>
</tr>
<tr>
<td>2.</td>
<td>Period of Annual Plans</td>
</tr>
<tr>
<td>3.</td>
<td>Fourth Five Year Plan</td>
</tr>
<tr>
<td>4.</td>
<td>Fifth Five Year Plan</td>
</tr>
<tr>
<td>5.</td>
<td>Water Grid Plan for Maharashtra State</td>
</tr>
<tr>
<td>6.</td>
<td>Task Ahead</td>
</tr>
</tbody>
</table>
1. Achievements of Irrigation in Maharashtra State

The State of Maharashtra has been established on 1st May, 1960. It would, therefore, be worthwhile to study the development of irrigation from the period of Third Five Year Plan period. The table No.1 presents a short review of developments. It supplies with the information relating to the net area irrigated with different sources, net area sown and percentage of irrigated area to sown area, from 1961-62 to 1965-66, that is, during the Third Plan period.

<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Government Canal</td>
<td>2,088.0</td>
<td>2,207.2</td>
<td>2,169.2</td>
<td>2,130.0</td>
<td>2,168.4</td>
</tr>
<tr>
<td>2.</td>
<td>Private Canal</td>
<td>299.8</td>
<td>312.0</td>
<td>352.4</td>
<td>321.6</td>
<td>292.8</td>
</tr>
<tr>
<td>3.</td>
<td>Tanks</td>
<td>1,804.4</td>
<td>1,973.6</td>
<td>2,046.8</td>
<td>2,103.2</td>
<td>1,868.8</td>
</tr>
<tr>
<td>4.</td>
<td>Wells</td>
<td>6,037.2</td>
<td>6,242.4</td>
<td>6,430.4</td>
<td>6,747.2</td>
<td>7,024.4</td>
</tr>
<tr>
<td>5.</td>
<td>Other sources</td>
<td>418.4</td>
<td>492.0</td>
<td>416.4</td>
<td>466.4</td>
<td>558.8</td>
</tr>
<tr>
<td>6.</td>
<td>Net Irrigated area</td>
<td>10,686.8</td>
<td>11,127.2</td>
<td>11,368.8</td>
<td>11,768.4</td>
<td>11,923.2</td>
</tr>
<tr>
<td>7.</td>
<td>Net Sown Area</td>
<td>1,78,442.8</td>
<td>1,78,036.8</td>
<td>1,79,680.8</td>
<td>1,80,426.4</td>
<td>1,79,233.2</td>
</tr>
<tr>
<td>8.</td>
<td>Percentage of 6 to 7</td>
<td>6.0%</td>
<td>6.2%</td>
<td>6.3%</td>
<td>6.5%</td>
<td>6.5%</td>
</tr>
</tbody>
</table>

Source: Season and Crop Reports for the years 1961-62 to 1965-66, Department of Agriculture, Government of Maharashtra.
Third Plan : Provision and Actual Expenditure on Irrigation

The Third Plan of the State provided Rs.6,836.35 lakhs for irrigation and allied activities. But actual expenditure was only Rs.6,321.23 lakhs.*

Third Plan - Targets : Major and Medium Works

The plan included 45 spill over projects from the Second Plan and 27 new schemes. Again, other common schemes like flood control, improvement and extension of existing works, survey and investigation of irrigation projects and irrigation research, etc. were also included. In addition to this, building up of Mechanical Organization was also provided for in this plan. In order to undertake servicing maintenance and management of machinery and to provide training to the cadres of operators for effective utilization of machinery such organization was essential.

Out of 45 spill over projects only 36 projects were physically completed during the Third Plan and have started yielding returns.

Again out of 27 new schemes only the following schemes were in advance stage by the end of the Third Plan - (i) Manar Stage-II, (ii) Malangaon, (iii) Morna, (iv) Mangarh, (v) Sangrampur, (vi) Wunna, (vii) Khani

(Saikheda) and (viii) Shirni. Most of other projects were in the initial stages.

Reasons for Shortfall

This discussion points out that, during the Third Plan, the actual expenditure has fallen short of the provision by about Rs.515.12 lakhs. Again, out of 45 spillover projects, 9 projects' could not be completed and out of 27 new projects about 2/3 projects were in the initial stages and have, therefore, to be spilled over to Annual Plans. It can, thus, be said that Third Plan could not achieve what was decided. It would be essential to know, therefore, the reasons that have caused this shortfall - These reasons have been enumerated below:

1) Foundation and Technical Difficulties

During the course of construction, some foundation and other technical difficulties were encountered which could not be fully investigated and, hence, successfully met. This caused delay in construction.

2) Inter-State Aspects

Some projects could not be given the necessary speed because of their Inter-State nature. In case of
such projects, the concerned State have to reach agreement otherwise the projects cannot be constructed.

iii) Shortage of technical personnel and earth moving machinery, and

iv) Delay in clearance of some projects by the Central Water and Power Commission and the Planning Commission.

Minor Irrigation in Third Five Year Plan

Minor irrigation schemes include wells, Tube wells, tanks, bandharas (weirs) installation of rehats, Persian wheels and lift irrigation schemes. The State Departments of Agriculture, Co-operation, and Irrigation and Power and the Panchayati Raj Institutions jointly undertake the construction of these various schemes.

Though the Third Five Year Plan of Maharashtra State provided Rs.1,583.89 lakhs for minor irrigation the actual expenditure incurred was Rs.2,422.74.* Consequently, number of schemes were completed in various parts of the State on a very large scale.

During the Third Plan period 1.06 lakh new wells were dug, 0.36 lakh old wells were repaired and 0.61 lakh pump sets were installed.

The State of Maharashtra experienced the scarcity or near famine conditions during 1964-65 and 1965-66, in which the State Government incurred on additional expenditure of Rs.29 crores. In addition to this an amount of Rs.11 crores was spent on famine relief works and Tagai.*

2. Period of Annual Plans

The following Table No.2 supplies with the information about the financial allocation, actual expenditure incurred and additional irrigation potential created by the Major and Medium Irrigation projects from 1966-67 to 1969-70, i.e., during the period of Annual Plans.

Table No. 2: Allocation, Expenditure and Potential Created by Major and Medium Works in State of Maharashtra. ( Rs. in Crores )

<table>
<thead>
<tr>
<th>Year</th>
<th>Allocation</th>
<th>Expenditure</th>
<th>Potential created (000' Hectares)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1967-68</td>
<td>16.00</td>
<td>18.29</td>
<td>32.90</td>
</tr>
<tr>
<td>1968-69</td>
<td>22.72</td>
<td>23.29</td>
<td>58.51</td>
</tr>
<tr>
<td>1969-70</td>
<td>22.50</td>
<td>25.11</td>
<td>32.18</td>
</tr>
</tbody>
</table>


Main Objective: Clearance of Backlog

The main objective, during the period of Annual Plans, so far as the major and medium irrigation works were concerned, was the clearance of backlog of development in the past.

From the 1966-67 to 1969-70, three major spillover schemes of the Third Five Year Plan, viz., Purna, Girna and Vir, were completed.

Again nine medium irrigation schemes of Karwand, Malangaon, Mangarh, Sangrampur, Karnoor, Sukhana, Madi, Wan and Ghirni were also completed during 1966-67 to 1969-70.

Thus, the efforts were made to clear the backlog.

New Major Projects

Six new projects of Bhima, Jayakwadi, Krishna, Warna, Upper Godavari and Kukadi were taken during the period of Annual Plans.

The major projects Khadakwasala, Mula, Bhima, Bagh, Itiadorh and Jayakwadi, are in advanced stages of construction.

Minor Irrigation in Annual Plans

The irrigation potential created by the minor irrigation schemes in the State sector, at the end of 1968-69 was 1,49,960 hectares. But the total utilization, in the same year, was only 71,652 hectares.
In the years of 1966-67 and 1967-68 about 0.40 lakh of new wells were dug, 0.21 lakh old wells were repaired and 0.34 lakh pump sets were installed.

**Brief Review of Irrigation Between 1966 and 1970**

The following Table No. 3 presents a brief review of area irrigated by various sources in Maharashtra State between 1966 and 1970.

**Table No.3 : Area Irrigated by Different Sources in Maharashtra from 1966-67 to 1969-70.**  
(figures in Hundred Hectares)

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Government Canals</td>
<td>2,124.8</td>
<td>2,461.6</td>
<td>2,482.0</td>
<td>2,804.0</td>
</tr>
<tr>
<td>2.</td>
<td>Private Canals</td>
<td>282.8</td>
<td>298.8</td>
<td>277.0</td>
<td>317.0</td>
</tr>
<tr>
<td>3.</td>
<td>Tanks</td>
<td>2,104.2</td>
<td>2,159.2</td>
<td>2,243.0</td>
<td>2,251.0</td>
</tr>
<tr>
<td>4.</td>
<td>Wells</td>
<td>6,900.8</td>
<td>7,126.8</td>
<td>7,964.0</td>
<td>8,211.0</td>
</tr>
<tr>
<td>5.</td>
<td>Other sources</td>
<td>616.2</td>
<td>559.6</td>
<td>779.0</td>
<td>729.0</td>
</tr>
<tr>
<td>6.</td>
<td>Net Irrigated Area</td>
<td>12,030.8</td>
<td>12,604.0</td>
<td>13,745.0</td>
<td>14,312.0</td>
</tr>
<tr>
<td>7.</td>
<td>Gross Area Irrigated</td>
<td>13,969.6</td>
<td>14,591.2</td>
<td>15,568.0</td>
<td>16,232.0</td>
</tr>
<tr>
<td>8.</td>
<td>Gross Cropped Area</td>
<td>1,89,688.4</td>
<td>1,90,300.0</td>
<td>1,93,668.0</td>
<td>1,94,351.0</td>
</tr>
<tr>
<td>9.</td>
<td>Percentage of 7 to 8</td>
<td>7.4%</td>
<td>7.7%</td>
<td>8.0%</td>
<td>8.3%</td>
</tr>
</tbody>
</table>

Source : Season and Crop Reports, 1966-67 to 1969-70,  
Department of Agriculture, Government of Maharashtra.

**Conclusions**

The foregoing observations lead to the following conclusions:
i) Wells are Dominant

During the period under review, wells irrigated more than 57 per cent of net area irrigated in the State. Thus, the wells have proved to the mainstay of the irrigation system of the State.

ii) Government Canals are acquiring Importance

At the end of the year 1969-70, the net irrigated area under the Government canals was about 19.6 per cent. It means that approximately 1/5th of total net irrigated area of the State received irrigation facilities from the Government canal. The corresponding figure at the end of Third Five Year Plan was less than 16 per cent.

It leads to an inevitable conclusion that slowly but surely, the Government canals have started acquiring importance as a source of irrigation in the State.

iii) Tank Irrigation

Tanks come under minor irrigation and are more useful as the source of irrigation in the areas where canals or other surface flow irrigation methods are impossible. The percolation tanks are more useful as a means to raise the level of underground water table. And, hence, efforts may be made to encourage tank irrigation in the State.
iv) Rate of Increase of Irrigation Facilities is Quite Low

During the period under review about 0.9 per cent total increase in irrigation facilities has been achieved. It also leads to the conclusion that the rate of increase of irrigation facilities is quite low.

Comparative Study of Potential Created and Expenditure Incurred during 1960 and 1970 on Major, Medium and Minor Irrigation Works in Maharashtra State

The following Table No.4, presents in short information about the irrigation potential created and expenditure incurred on Major, Medium and Minor irrigation works during the decade of 1960 to 1970 in Maharashtra State.

Table No.4: Comparative Study of Potential Created and Expenditure incurred.

( Potential : Lakh Hectares) ( Expenditure Rs.Crore )

<table>
<thead>
<tr>
<th>Year</th>
<th>No. of Projects</th>
<th>Potential Created Major &amp; Minor</th>
<th>Expenditure Major &amp; Medium Minor</th>
</tr>
</thead>
<tbody>
<tr>
<td>1960-61</td>
<td>6 25 50</td>
<td>3.09 0.75</td>
<td>3,677.39 532.13</td>
</tr>
<tr>
<td>1970</td>
<td>20 56 43</td>
<td>6.03 1.55</td>
<td>21,355.31 575.00</td>
</tr>
</tbody>
</table>

Observations

The Table No. 4 leads to the following observations:

1) Potentials created have been almost doubled. In case of Major and Medium projects potential at the beginning of 1960 was only 3.09 lakh hectares while at the end of 1970 it was 6.03. In case of minor works it was 0.75 lakh hectares in 1960, it increased to 1.55 lakh hectares in 1970.

ii) Minor Irrigation works have incurred comparatively less expenditure than major and medium works. And, hence, to bring more areas under irrigation at a cheaper cost, construction of minor irrigation works be encouraged.

3. Fourth Five Year Plan

Objectives of the Plan

While preparing the Fourth Plan, the following objectives were set forth -

i) Completion of Spillover Schemes.
ii) Developing Irrigation facilities in Backward Areas.
iii) Increase in Irrigation Facilities in Scarcity Areas.
Fourth Plan Financial Provision for Irrigation

For major and medium irrigation projects a sum of Rs. 175 crores has been provided in the Fourth Plan. The corresponding figure in the Third Plan was only Rs. 68.36 crores.*

Thus, a sum of about three times more has been provided in the Fourth Plan by the State Government, so that their construction would not be delayed.

Major Projects included in Fourth Plan

The following spillover schemes from Third Five Year Plan and Annual Plans have been included in the Fourth Plan. These schemes are proposed to be completed in the Fourth Plan:


Vir and Girna projects have almost been completed and tempo of construction would be accelerated for the completion of rest of the projects in plan period.

Again, the following new major irrigation works have been included in the Fourth Plan. Most of these

57

projects have been submitted to the Central Government and awaited for the clearance from the Central Water and Power Commission:


It has also been decided to accelerate the development on these projects.

Medium Irrigation Schemes included in Fourth Five Year Plan

The plan includes 35 spillover schemes from Third Plan and Annual Plans with estimated cost of Rs.63 crores. It is proposed to complete these schemes in the Fourth Plan period. Other 22 new projects have also been included. On completion of spillover and new projects an irrigation potential of 4.72 lakh hectares would be created.

Minor Irrigation Works in Fourth Plan

For lift irrigation schemes, wells, pump sets, small bandharas and other small irrigation schemes an amount of Rs.6,550 lakhs has been provided in the Four
Plan by the State Government. The corresponding figure for the Third Plan was Rs.1,583.89 lakhs while actual expenditure was Rs.2,324.27 lakhs.

Thus, the provision for minor irrigation in the Fourth Plan is about three times more than the actual expenditure incurred during the Third Plan.

In addition to this, an amount of Rs.4,300 lakhs has been provided for Soil Conservation and for Ayacut Development an amount of Rs.350 lakhs have been provided in the Fourth Five Year Plan. Thus, all out efforts have been proposed with sufficient financial provision to undertake extension of minor irrigation facilities in the State.

At the beginning of Fourth Five Year Plan, i.e., at the end of 1968-69 the total irrigation potential created by Minor Irrigation works in the State sector was 1,46,960 hectares out of which only 71,652 hectares were under utilization.

Provisions

On minor irrigation works during 1970-71 and 1971-72 provisions were made in the annual budgets of the State of Maharashtra to the tune of Rs.12.50 crores and Rs.16.82 crores respectively. The provisions for the corresponding period for major and medium irrigation were Rs.28.00 crores and Rs.33.27 crores. For the
period 1973-74, for major, medium and minor irrigation works in the State sector a provision of Rs.63.74 crores has been made. In addition to this, an amount of Rs.25.13 crores has been provided for small irrigation schemes and soil conservation. An additional irrigation potential, from all sources of irrigation, amounting to 2,000 lakh hectares was proposed to be created in 1971-72.

4. Fifth Five Year Plan

The foregoing discussion gives clear idea about the magnitude of task ahead to develop all available water resources in the State. Such development is essential on two grounds, viz., (i) to prevent recurrence of famine, and (ii) to improve the standard of agriculture.

The Government of Maharashtra has decided to take a step in this direction and has, therefore, given a top priority for the development of irrigation in the Fifth Five Year Plan of the State.

The total outlay of the Fifth Five Year Plan is estimated at Rs.2,000 crores, whereas the corresponding figure of the Fourth Plan is only Rs.951 crores. The Fourth Plan has provided Rs.175 crores for irrigation whereas the Fifth Plan envisages to provide Rs.500 crore for major, medium and minor irrigation projects taken together.
So far as the achievement of physical targets are concerned, the Fifth Five Year Plan aims at bringing an additional area of 10 lakh acres under irrigation. Again, completion of 26 spillover projects from Fourth Plan and 25 new irrigation schemes, would be achieved in the Fifth Five Year Plan.

5. Water-Grid Plan for Maharashtra

Due to limited water resources in Maharashtra State, progress of irrigation has been held up. In order to overcome this difficulty, the Government of Maharashtra is planning for "Water-Grid" in the State on the lines of Ganga-Kaveri link. The plan proposes to harness the run-off flow of the rivers, storing the same at high places with the lifts and distributing the stored water in areas where the water shortage is experienced.

It has been realized that the expenditure on famine relief is not only large but is also recurring by nature. It has proved a great drain on the financial resources of the State. And, hence, the Government of Maharashtra has decided to implement water-grid scheme even at large capital investments. It is not possible for the State Government to finance such scheme out of its regular income and grants from the Central Government. As a result, it has now been decided to raise large amounts of loans to finance such scheme.
6. Task Ahead

Limited Scope for Irrigation

Available Water Resources

Table No. 5: Available Water Potential in Different River Basins in Maharashtra State

<table>
<thead>
<tr>
<th>Name of Basin</th>
<th>Culturable area (Lakh acres)</th>
<th>Irrigable command (Lakh acres)</th>
<th>Percentage of Water available at 75% dependability: TMCft.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Krishna (Proper)</td>
<td>32.92</td>
<td>10.26</td>
<td>25.5 769</td>
</tr>
<tr>
<td>Bhima</td>
<td>97.39</td>
<td>18.62</td>
<td>19.1 310</td>
</tr>
<tr>
<td>Godavari (Proper)</td>
<td>147.40</td>
<td>23.67</td>
<td>16.0 403</td>
</tr>
<tr>
<td>Wainganga</td>
<td>114.00</td>
<td>30.14</td>
<td>26.1 720</td>
</tr>
<tr>
<td>Tapi</td>
<td>82.83</td>
<td>12.93</td>
<td>15.6 229</td>
</tr>
<tr>
<td>Konkan</td>
<td>43.13</td>
<td>Not available</td>
<td>Not available 1,500</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>524.67</strong></td>
<td><strong>95.62</strong></td>
<td><strong>3,931</strong></td>
</tr>
</tbody>
</table>


Table No. 6: Maximum Irrigable Area

| i) According to Table No. | 96 lakh acres |
| ii) Maximum in Konkan region | 4 " " |
| iii) Additional due to 50% dependability | 15 " " |
| iv) Savings due to Lining | 15 " " |
| **Total**                  | **130 lakh acres** |

2. Ibid, p. 51.
According to Table No. 5; the total cultivable area available is 525 lakh acres. The "Current Fellow" is generally 25 lakh acres. Out of 500 lakh acres only 130 lakh acres would be brought under irrigation. Thus, only 26 per cent land would get irrigation facilities.

**Water Potential Available for Development**

The total utilizable surface water resources of 75 per cent dependability have been estimated at about 2,000 TMCft. The Maharashtra State Irrigation Commission, 1962, pointed out that more 3,000 TMCft. water would be available at 50 per cent dependability. Thus, taking the total to 2,300 TMCft. of water out of it, about 300 TMCft. water would be made available for generation of power. Consequently, only 2,000 TMCft. water would be available for irrigation. About 160 TMCft. water was been put to use for flow irrigation prior to 1951. It means that maximum to 1840 TMCft. water would be available for irrigation.*

**Total Cost of Development of Water Resources**

The Commission estimated the cost of development of water resources as follows:

---

Rs. in Crores

i) Flow irrigation including wells ... 1,130.0
ii) Wells outside command areas ... 50.0
iii) Contour bunding ... 130.0
iv) Terracing ... 25.0
v) Other Items ... 60.0

Total : 1,395.0

That is, Rs.1,400 crores approximately.*

These estimates have been based on the current prices prevailing in 1962. Since, the prices have gone up considerably, these estimates cannot be treated as valid. It has now been officially estimated that due to increased prices the cost would now be higher at Rs.2,600 crores.

Causes of Retarded Growth of Irrigation

On the one hand, there is a continuous increase in the financial outlay but on the other hand there is no proportionate increase in the area under irrigation. Rather, expenditure incurred is quite disproportionate to the additional irrigation potential created and utilized.

The following are chief reasons for the same.

Ibid, p. 56.
i) Monsoon Fed Rivers

Most of the rivers are monsoon fed and, hence, can supply water only during monsoon. Consequently, big dams need to be constructed, with storage facilities so that water can be supplied throughout the year through the canals.

ii) Physical Features

Physical features of the State are quite peculiar. These do not allow to have a network of the canal systems. Again, excavation of the canals is also quite costly. And, hence, the Government has to incur more expenditure to bring additional area under irrigation.

iii) Due to continuous price rise, the cost of construction is also increasing.