8. Water-Supply arrangements at Bijapur and Chitradurga

The arrangements made by the Adil Shahis in the 16th and 17th centuries to supply water to their capital Bijapur were remarkable. It is possible that they continued and improved upon the Vijayanagara system in this matter and it is even possible that they employed the Vijayanagara architects after the Battle of Talikota or Rakkasatangadi. It is said:

While laying out the City of Bijapur, the planners have taken care to provide for efficient system of water distribution ... The architects incorporated hydraulic arrangements in all the edifices and planned and designed with great efforts arrangements to bring water into the city and nearer to the point of utilisation. Expectedly, Bijapur abounds in such hydraulic structural remains built during the Adil Shahi period, in the form of tanks, wells, towers, baths, fountains and lengths of earthen conduits.

Henry Cousens has described the means adopted by the Adil Shahi architects to bring water in larger quantities from reservoirs located upon higher grounds outside the
city by force of gravitation and distributed it to the various parts of the city. Though the remains of some of the reservoirs are still existing today, their connections are either completely ruined or are out of repair. Of course, some of the pipes are still working. Begum Talab was one of the great reservoirs from which water was brought by laying earthen pipes.

The Chitradurga Palegars in the 17th and 18th centuries made a remarkable arrangement for water-supply to their capital and irrigation of the neighbourhood as follows. The rainwater that poured on the Jogimatti hills was collected in a tank called Doddannanakere, which when filled, let the water to other tanks below it called Timmannanayakanakere and Sannakere which in turn, after themselves being filled, allowed the water to two other reservoirs called Dabdaba and Vaddu by a similar process. After filling all these tanks, water used to flow to the moats round the fort-walls.

Similarly, the rain water falling on Meldurga or upper fort filled a series of reservoirs one below the other called the Gopalakrishnadevarahonda, Akkatangerahonda, Sihinirinahonda, and finally by a secret underground channel the Santhehonda. It is due to this wonderful arrangement, that the fort never in its long history suffered from water scarcity.

Sources:

1. ("Hydraulic features of Bijapur"), P.S. Sriraman and S.G.

<table>
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<tr>
<th>Tanks</th>
<th>Cuttas</th>
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<td>$14,803 \frac{3}{4}$</td>
<td>$6,172 \frac{1}{2}$</td>
<td>8,562</td>
<td>$747\frac{1}{2}$</td>
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275
Though in respect of Malavally, Arkalgud and Maharayandoorga the number of irrigation works is not found in the Memoirs, it is described that in Malavally "the western part and surrounding the casba there were several extensive tanks which besides rearing paddy, nourished several gardens of beetle, soopary, cocoanut and plantain. It also states that there were traces of an ancient anicut from the Kaveri to the tank south of casba and near the field of battle in 1799.

Likewise, it is stated that in Arkalgood there were many tanks, those at 'Casba and Coonanoor' were very extensive. Almost every village had its tank and some two or three though of less extent and on the whole the district was well watered.

As regards Maharayandoorg, it is stated that there were few tanks in Goroor hoblly although it abounded with paddy grown in its innumerable little valleys by periodical rains.
10. Number of Tanks in the several districts of Mysore as in 1871

<table>
<thead>
<tr>
<th>Division</th>
<th>TOTAL NO. OF TANKS</th>
<th>NO. OF TANKS YIELDING NO REVENUE</th>
<th>NO. OF TANKS YIELDING REVENUE BELOW 50</th>
<th>Number of tanks yielding revenue between</th>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>50 TO 100</td>
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<tr>
<td>Nandidurg Division</td>
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<tr>
<td>1. Bangalore Dist.</td>
<td>2,227</td>
<td>254</td>
<td>862</td>
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<tr>
<td>2. Kolar Dist.</td>
<td>5,282</td>
<td>1,427</td>
<td>2,028</td>
<td>783</td>
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<td>3. Tumkur Dist.</td>
<td>2,081</td>
<td>1,096</td>
<td>285</td>
<td>175</td>
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<tr>
<td>Ashtagram Division</td>
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<tr>
<td>1. Mysore Dist.</td>
<td>1,474</td>
<td>36</td>
<td>874</td>
<td>219</td>
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<tr>
<td>2. Hassan Dist.</td>
<td>6,324</td>
<td>566</td>
<td>3,903</td>
<td>910</td>
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<tr>
<td>Nagar Division</td>
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<td></td>
<td></td>
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<tr>
<td>1. Shimoga Dist.</td>
<td>8,304</td>
<td>931</td>
<td>3,871</td>
<td>1,418</td>
</tr>
<tr>
<td>2. Kadur Dist.</td>
<td>8,378</td>
<td>4,452</td>
<td>2,910</td>
<td>640</td>
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<tr>
<td>3. Chitradurga Dist.</td>
<td>1,785</td>
<td>1,103</td>
<td>268</td>
<td>93</td>
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<td></td>
<td>36,265</td>
<td>9,865</td>
<td>15,001</td>
<td>4,645</td>
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</table>
11. Number of Tanks as existing in Mysore State in 1902 as given in the Memorandum of Sri. V. P. Madhav Rao

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<th>Western Division</th>
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<td></td>
<td>Number</td>
<td>Area (Acres)</td>
<td>Assessment (Rs.)</td>
<td>Number</td>
</tr>
<tr>
<td>1st class tanks with atchkat of Rs.5,000 and above</td>
<td>23</td>
<td>31,871</td>
<td>1,76,406</td>
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<tr>
<td>2nd class tanks with atchkat of Rs.1,000 to 5,000</td>
<td>388</td>
<td>1,23,464</td>
<td>6,55,455</td>
<td>95</td>
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<tr>
<td>3rd class tanks with atchkat of Rs.500 to 1,000</td>
<td>512</td>
<td>72,713</td>
<td>3,44,420</td>
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<tr>
<td>4th class tanks with atchkat of Rs.300 to 500</td>
<td>644</td>
<td>54,003</td>
<td>2,48,936</td>
<td>483</td>
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<tr>
<td>5th class tanks with atchkat of Rs.100 to 300</td>
<td>2,221</td>
<td>92,545</td>
<td>3,97,483</td>
<td>2,450</td>
</tr>
<tr>
<td>6th class tanks with atchkat of Rs.100 and below</td>
<td>4,478</td>
<td>55,736</td>
<td>1,99,069</td>
<td>10,437</td>
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<tr>
<td></td>
<td>8,266</td>
<td>430,332</td>
<td>20,21,769</td>
<td>13,766</td>
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</table>
**Note** Eastern Division comprised of districts of Bangalore, Kolar, Tumkur and Chitradurga. Western Division comprised of districts of Mysore, Hassan, Shimoga and Kadur.

### Status of the Tanks

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<tr>
<th>Class</th>
<th>Condition</th>
<th>Area</th>
<th>Assessment</th>
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<tbody>
<tr>
<td></td>
<td>Breached</td>
<td>Good</td>
<td>(acres)</td>
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<tr>
<td>Government tanks</td>
<td>6,507</td>
<td>20,017</td>
<td>7,52,916</td>
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<tr>
<td>Kodagi tanks</td>
<td>92</td>
<td>1,014</td>
<td>27,457</td>
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<tr>
<td>Inamti tanks</td>
<td>336</td>
<td>1,049</td>
<td>24,976</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>6,935</strong></td>
<td><strong>22,080</strong></td>
<td><strong>8,05,349</strong></td>
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Tank Irrigation in Karnataka
### 12. Table showing year-wise area irrigated under channels and tanks

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<th>Year</th>
<th>Area Irrigated Under</th>
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<tbody>
<tr>
<td></td>
<td>Channels (Acres)</td>
<td>Tanks (Acres)</td>
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</tr>
<tr>
<td>1880-81</td>
<td>59,784</td>
<td>2,33,201</td>
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<tr>
<td>1881-82</td>
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13. "PHAD" System of Distribution of Water and Maintenance of Irrigation System in Maharashtra

Introduction

'PHAD' is a group of contiguous farms where the same crop is grown under irrigated conditions. 'PHAD' System is the management of irrigation by a group of beneficiaries. For over 200 years such a system of irrigation management has been practised on small irrigation works in the North-Western part of Maharashtra. Even though the farms are small and the lands are not levelled, the farmers have been managing the water allocation and equitable distribution of water, rotation of crops and maintenance of the system through community effort.

This system of water management has been practised in the Tapi basin in North Western Maharashtra on their rivers, namely Panjra, Mosam and Aram. On these rivers there are a series of Bandharas or weirs. These systems receive their run-off from the monsoon rains but have a significant post-monsoon flow which can sustain sizeable irrigation in the winter and summer seasons. These systems are managed, operated and maintained by the beneficiaries themselves through 'PHAD' system. Each system comprises of a low diversion weir across the river, small canal on the bank and distribution system for irrigation. The area
under irrigation in each weir varies from 4 to 192 ha. The maintenance is done by the beneficiaries by contributing funds for the purpose and by organising community labour from the village. The management of the maintenance funds is also done by the beneficiaries. The records show that Government only framed guidelines as to how the implementation by the beneficiaries was to be done and how accounts should be maintained.

Water Management Committee

For management of irrigation under the command of each weir, there is a committee called the Panch Committee elected by all the irrigators. The members of the Committee i.e., Panchas have to be irrigators in the PHAD. The committee appoints Irrigation Staff on an annual basis, hears complaints from irrigators and irrigation staff and also takes policy decisions regarding the allocation of water and maintenance of the system.

Water Management

The entire command area is divided into "PHADS", with the size varying from a few hectares to 50 ha depending upon topography. Only one type of crop is grown in each "PHAD". The crops to be grown in different "PHADS" is decided by an assembly of irrigators well in advance of the rainy season. The sequence of Irrigation is from head to tail. The PHAD at the top end is irrigated and the entire flow in the canal is diverted to that PHAD. Within the PHAD, the farms at the head reaches are irrigated first and then the adjacent ones and so on till tail farms are irrigated. After the rainy season, there is another
meeting of the irrigators and depending upon the rate of 
flow in the river and in the canal, broad guidelines are 
laid down as to how the water should be rationed. The 
water distribution is done by the irrigation staff of the 
PHAD. The rotational schedule is strictly followed and 
those infringing the rules are fined by the committee. The 
actual water application on the farm is also carried out 
by the irrigation staff. The land owners or Members of 
his family are not authorised to apply the water in their 
farms.

**Maintenance**

The maintenance and repairs of the weir structure 
is the responsibility of the Government, whereas the canal 
system is maintained by the irrigators themselves. The 
cleaning of the canal system is generally done twice a year 
in May and October. Immediately after the meeting in 
April-May, the irrigators are informed through a Public 
Announcement about the requirements of maintenance. 
Each beneficiary family is expected to provide animal and 
manual labour. The families which do not provide animal 
and manual labour have to pay in cash. The farm water 
courses for carrying water from the distributary to the 
farm are to be maintained by the individual irrigators. 
The responsibility of the irrigator is to maintain the channel 
length between the off take point and the delivery point 
of his farm.
Irrigation Staff

The irrigation staff normally consists of supervisors, Watermen and Watchmen. This staff is appointed by the Committee and is actively involved in distribution of water as well as maintenance operations. During irrigation all the staff work in the same "PHAD" where water is being applied. The application of water to individual farms is done by the waterman since irrigators are not permitted to apply water. The supervisors have to oversee the work of waterman and watchmen. The staff is paid either in cash or in kind or sometimes partly in cash and partly in kind. Each irrigator has to pay according to the crop grown in the PHAD. Before the irrigation staff is appointed by the Committee, the staff has to enter into an agreement with Committee in respect of their duties etc.

Defaulters

Default is generally of three kinds -
(i) Unauthorised watering (out of turn)
(ii) Non-maintenance of farm water-course
(iii) Non-participation in the maintenance of canal.

In case of unauthorised watering, the matter is reported by the supervisor to the committee and a penalty is imposed in the form of a fine. Non-maintenance of farm water courses attracts the penalty of loss of turn of irrigation. Non-participation in the maintenance of canals either in the form of contribution of labour or payment is also dealt with in the same manner as unauthorised watering. Such cases are, however, very rare.
Analysis of the System

For smooth operation of the system important factors are:

(i) Allocation and distribution of water to sub-units and farms.
(ii) Mobilisation of human and other resources to maintain and repair the physical system.
(iii) Resolving of disputes.

The cohesive force binding the group together is the common concern for watering the fields (collective common interest). Members realise that unless they come together all will suffer. How strong this cohesive force is in the concerned village is illustrated by the fact that despite political and local rivalries, the farmers' groups have been working harmoniously as far as water management and distribution is concerned. Though the common concern provides the motivating force, the stability to the group is imparted through rule formulation on the principle of fairness to all to gain acceptance of the participating members. Being a written record, it is known to all the farmers and hence they are conscious of their duties and responsibilities. Roles of members and panchas are clearly defined. To avoid conflicts, the task of water application was handed over to irrigation staff appointed and paid for by the beneficiaries. Divisions of command into Phads (blocks) and planning of only one crop in each Phad helps in the management of irrigation application. The water requirements for a PHAD are the same and the entire area in a PHAD can be treated uniformly for water application.
Maintenance is through community effort and the payment to irrigation staff is made in kind. The staff is allowed a specified share in the harvest. In this way the staff are also somewhat involved in the process of raising the crop. Experience of PHAD system has shown that the small size farm is not an impediment to group functioning. In the areas of PHAD system no prior land levelling seems to have been done, yet no wasteful application of water is seen.

In PHAD system, the area for irrigation is earmarked in relation to the average annual water flows rather than flows in good years. The area to be irrigated in years of plentiful flow is an extended area so that the farmers in this extended area know that they will get water once in a few years. This area is invariably at the tail end. This is a very practical and manageable arrangement. During the years when average quantity of water is not available, either cropping plan is suitably adjusted or water is rationed by extending the irrigation interval by ensuring equity among all the members.

There is an increasing awareness today of the need to involve beneficiaries in water management and distribution for more optimum utilisation of the irrigation facilities in the newly commissioned irrigation projects. Behind the advocacy of increasing association of beneficiary farmer in the management of irrigation system lies the assumption that it would reduce distribution cost and increase the effectiveness of the system with the help of knowledge of local conditions which the beneficiaries would bring to solve the problems and reduce governmental intervention which cannot always appreciate local needs and difficulties.
The success of the PHAD system shows that even though the holding sizes are small, it is possible for the beneficiary farmers to effectively come together and manage the irrigation system as a community asset.


Source:

The Appendices 13, 14 and 15 are Appendices to letter No.10-37/85-CAD dated 30th April 1987 from the Additional Secretary, Ministry of Water Resources (Govt. of India), CAD and Water Management Division, and are termed as guidelines for Farmer's Participation in Water Management.

(Ref: Note prepared by Surat Irrigation Circle, Surat, Govt. of Gujarat and Surat Canal Division, Surat, March, 1984).

1. Introduction

Co-operation in any walk of life helps in promoting health of society at large. Formation of water-cooperative societies within the command area of irrigation projects can bring about social reforms and therefore such cooperatives merit encouragement from all concerned.

2. The Role of Cooperatives in Irrigation

There is a large number of successful water co-operative societies running small irrigation schemes in the private sector. However the concept of water management of state owned irrigation projects through such water co-operatives is of only recent origin. Moreover, it is only need based in the context of fast flowing development in all spheres of Nation's life. The benefits of irrigation projects are too well known. Now, the time is ripe for shifting the emphasis from construction of new projects
to improve the operational efficiency of the completed ones. It is in this area that water co-operatives have an important role.


Water stored in irrigation reservoirs is conveyed to individual fields in the command area through an intricate network of canal system and field channels. The farmers apply for water individually and receive the same in accordance with predetermined rules and procedure which take for granted internal cooperation at least between farmers receiving irrigation water from the same outlet of the canal system. In absence of such co-operation, equitable water distribution according to the need of each farmer becomes difficult and at times the farmers located in the farthest end of the command area have to suffer as water cannot reach in time to their fields on account of quarrelling farmers of the upper reaches and not permitting smooth flow of irrigation water through their fields to the fields located in the tail end of the command. Even in the much publicised system of rotational water distribution, the tail enders suffer on account of lack of harmony and co-operation amongst all farmers. The law also cannot enforce co-operation.

3.1. One more limitation of the conventional water distribution relates to methodology of levying charges of irrigation water. Because of the very nature of things it is not possible to measure volume of water supplied to each farmer and consequently the water rates are not directly related to volume of water supplied. Therefore,
the canal authorities adopt the system of levying water rates based on crop/area and season. On account of such a system, the farmers use even more water than required by crops and thus not only waste the costly water but also spoil their valuable lands in the long run. The water co-operatives provide an answer to this menace also as in that case water can be sold to the co-operatives and water rates can be levied on the basis of volume of water measured at the supply point. The responsibility of equitable and efficient distribution of this water amongst the farmers vests in the co-operative society.


Kakrapar is the largest completed irrigation project of Gujarat. Its canal system, drawing water from the weir constructed at Kakrapar village across river Tapti in South Gujarat, provides irrigation facilities to about two lakh hectares of land. The multipurpose Ukai reservoir was completed, subsequently in the year 1972 across the same river Tapti at about 32 kilometers upstream of Kakrapar Weir.

4.1 Encouraged by the State Government the Mohini Water Co-operative Society (M.W.C.S) was registered in September 1978 under State Co-operative Societies Act of 1961 and it started its work actively in March 1979 with its headquarters at village Mohini of Chorasi Taluka of Surat District. It was assigned gross command area of about five hundred hectares getting irrigation facility through four water courses and two direct outlets of 'Bhestan
Minor’ of the Kakrapar Canal System. The corresponding culturable command of the area assigned to M.W.C.S. is about 475 hectares.

4.2 Main features of Bye-laws and Objectives of M.W.C.S.-

(a) To promote the spirit of co-operation and self-reliance.
(b) Water management on the basis of equity and need of the members.
(c) Operating and maintaining the canal system outlets and field channels efficiently.
(d) Educating the members in improvised farm management techniques.
(e) Purchase of equipment needed for agricultural operations.
(f) Establishing rotational water distribution system to ensure timely supply of water to each farmer.
(g) Levy and recovery of water charges from the members in accordance with the rates fixed by the State Government.
(h) To ensure that water is not wasted at all by any member.
(i) To raise the working capital not exceeding Rs.50,000/- shares of Rs.50/- each.
(j) To enroll all farmers within its area as members.
(k) To carry out other activities for promoting the welfare of the society and its members.

4.3 The Growth and Activities of M.W.C.S.

In the first year of its formation i.e., in the year 1978-79 the M.W.C.S, started with 145 members and a share
capital of Rs.7,900/- only. During this year (a) the distribution net work of canals was renovated (b) additional outlets were added (c) the vulnerable reaches of even water courses were lined and (d) all preliminary procedures were set up for smooth interaction with local officers of Government for all matters. Thus the responsibility of water distribution levy and collection of water charges and operating and maintaining the canal system within the area assigned to M.W.C.S. was completely taken over from Government in the very first year of its inception. The M.W.C.S. made a net profit of Rs.17,000/- on account of its efficient management.

4.3.1 During the second year (1979-80) the membership increased to 161 from 145 and the share capital increased to Rs.9,000/-. The M.W.C.S. purchased one tractor and other equipment to assist its members in carrying out various farm management operations expeditiously and with least cost. Besides, the M.W.C.S. also collected a large portion of the past dues of Government regarding unpaid water charges from its members. A system of advance collection of water charges and in lieu thereof payment of some compensation with a view to encourage advance payment was also successfully established. Despite such concessions and capital invested on purchase of tractor and other equipments the M.W.C.S. continued to make a net profit of about Rs.3,000/- on account of increased area receiving irrigation and overall efficient management.

4.3.2 During the third year 1980-81 the M.W.C.S. membership rose to 181 and its share capital rose to Rs.10,000/-. During this year also it made a net profit of about Rs.6,000/-. The tractor purchased during previous year also earned a net profit of Rs.21,500/-. The M.W.C.S.
organised an educational tour of its members to Agriculture University at Navsari and to Mahi projects and Amul Dairy of Anand in Kaira District. The area irrigated during this year increased substantially.

4.3.3 During the subsequent year i.e., 1981-82 and 1982-83 membership increased from 181 to 203 and its share capital also rose to Rs.11,100/- . During the year 1981-82 society made net profit of Rs.10,403/- profit was also made through machinery.

During the year 1982-83 M.W.C.S. made a net profit of Rs.7,331/- and a net profit of Rs.364/- through machinery. So the M.W.C.S has made tremendous all round impact and its name and fame have spread not only in the entire State but also in the entire irrigation sector of the country at large.

Water was supplied by Government to M.W.C.S. in bulk and charged on volumetric basis at the rate of 25 paisa per ten thousand litres.

The rate was revised vide Government letter No.UTR/1083/6/p dt.1.4.83 from Rs.0.25 to Rs.0.30 per ten thousand litres from June 1984.

The M.W.C.S. charged its members the prevailing water rates fixed by Government from time to time on crop/area season basis.

4.3.4 It is pertinent to note that prior to formation of M.W.C.S. the sum total of area receiving irrigation in all seasons in its command was only 450 hectares, which
increased by 100 per cent during the last four years 1979-80 to 1982-83. This is a very great achievement itself as the value of additional agricultural produce which directly helps in increasing nation's income, is very large compared to a small managerial support and subsidy in water rates received by the M.W.C.S. from the State Government. As against these subsidies the State Government saved the recurring expenditure on operation maintenance and repairs of the canal system covering the area assigned to M.W.C.S.

The M.W.C.S. had requested to increase the area by adding the Bhestan Minor which has a C.C.A. of 44.20 hectares covering a village Deladva and Mohini. As per the request of M.W.C.S. the area of Bhestan Minor was added in command of M.W.C.S. area. The charge handed over to M.W.C.S. on 16.2.83 and accordingly water is being supplied through the water course also from hot season 1983-84 and charges are also recovered from society accordingly.

4.3.5 The State Government provided for the first three years one manager, one mistry and two clerks for M.W.C.S. and also agreed to reimburse the net loss if any during the first three years. Besides, a uniform water rate of 30 paise per 10,000 litres was charged to the M.W.C.S. for all crops whereas the State Government permitted M.W.C.S. to charge its members such different water rates as were decided by State Government from time to time for different crops on the basis of area irrigated. Since M.W.C.S. had a large proportion of cash crops like sugarcane and summer groundnut for which the water rates on area basis are relatively high, it could earn some profit in water rates. The efficient and wasteless use of water are also
major contributory factors for the success story of M.W.C.S.

The Government of Gujarat has revised the water rates for irrigation purpose vide Government letter No.WTR/1083/6/p dt.1.4.83 to Rs.0.25 to 0.30 per 10,000 litres of water consumed with effect from June 1984.

5. Conclusion

Water co-operative societies have promising future in the command areas of irrigation projects of all kinds. It offers ideal solution of the rather complex problem of distribution of irrigation water on the basis of equity. It also makes easy introduction of the discipline of rotational water distribution and also of irrigation water in bulk on volumetric basis. Water co-operatives should be encouraged to grow very fast and in great number with a view to optimise the benefits of irrigation projects and there by raise the overall status of social life from good to better and best in days to come.
15. Brief note on the working of the Sinchai Panchayats in Tawa Project (M.P.)

(Ref: Note on Sinchai Panchayats enclosed to D.D. NO.IRR/11/86/6535 dt. 12.6.86 from Smt. Shashi Jain, Commissioner and Ex-Officio Secretary, Tawa Project, M.P.)

Under the Madhya Pradesh Irrigation Act applicable for all irrigation works spread over entire Madhya Pradesh there is a provision for constitution of the Sinchai Panchayats. Each Panchayat is formed for about 400 ha (1000 acres) of irrigated area covering around 3-4 villages.

In the Tawa Project Command Area these Panchayats have been fully constituted in 2 out of 5 irrigation divisions, their number being 124. In another 2 divisions elections have been held for 79 Panchayats and they would be constituted as soon as the approval of the Collector is received. In the 5th Division, construction work is in progress and very little irrigation potential has been created so far. For these limited areas the Sinchai Panchayats will be formed this year.

The electorate for election to the Panchas of the Sinchai Panchayat comprises of all the beneficiary farmers in the area. Ordinarily there are 5-7 members in these Panchayats, three members being elected for the first 100 beneficiaries and an additional one for every 100 beneficiaries. Such election is subject to the approval of the Collector,
who also has the power to nominate a member or dismiss
any member or dissolve any Panchayat for reasons to be
recorded in writing. The members of the Panchayat elect
a Sarpanch from amongst themselves.

The term of a Sinchai Panchayats is 3 years subject
to the election of the new Panchayat, the Collector having
the right to extend this term for another period of 3 years.

The Sinchai Panchayats are entrusted with the
responsibility of orderly management and distribution of
irrigation water. Successful operation of the water discipline
through Warabandi and Osarabandi is also a major responsibility
entrusted to the Irrigation Panchayats. They are required
to assist the Irrigation Department in arranging for construction
of water courses and in recording and checking of irrigation
measurement and settling land and water disputes. The
essential repairs for the water courses are also to be carried
out by them. Moreover one of the important responsibilities
of the Sinchai Panchayats is to collect irrigation revenue
and to remit it to the Treasury without delay, and in any
case within 14 days of the collection. The Panchayat is
also required to assist in detecting and preventing encroach-
ments on canal roads and to report any wilful damage
caused to irrigation works.

For effective discharge of their duties Sinchai Panchayats
are empowered to impose fines up to Rs.50/- for specified
offences such as obstruction caused to the free flow of
water in the irrigation canals, diversion or wastage of
water, damage caused to any permanent points like gauges
and measuring devices, grazing of cattle on the canal
banks etc. Besides, as an incentive for collection of irrigation
dues a commission is paid to the Panchayats at the rate
of Rs.30/- per 1000/- for first Rs.1000/- collected and Rs.20/- per thousand for collection of additional amounts. This commission is required to be distributed in proportion of 2:1 between the Sarpanch and such of the Panchayat members, who have assisted in the collection of dues.

An administrative commission of 9 paise per acre of the irrigation area is also given to the Sinchai Panchayats for meeting their administrative expenditure of stationery etc. The Panchayat can itself use the penalty amount for important maintenance of canals etc.

It is proposed to make the Sinchai Panchayats powerful and in fact involve them in the areas of their responsibility as per the provisions of the Irrigation Act. In order to make them effective in the discharge of their responsibilities it has been decided to entrust them with the entire responsibility for distribution of water below outlet level in the Warabandi area, to begin with. For the year 1986-87 a programme for introduction of Warabandi in 60 thousand ha is being taken up as against 7,500 ha last year. In order to enable the Panchayats to understand the importance and procedural requirements for introduction and implementation of Warabandi a programme of training is being chalked out which would involve the training of all the Panchas of the Sinchai Panchayats along with the field staff of irrigation and Agriculture Departments.
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GLOSSARY

Agrahāra  A village held by Brahmin scholars on a favourable tenure.

Amaldār, Amildār  A collector in charge of a taluk.

Amāni  Lands or other sources of revenue held under the direct management of Government officers.

Amātya  A Minister.

Anicūṭ, Anicūṭ, Anūe  A masonry or brick dam across a river or a stream for the purpose of raising the water and distributing it by side channels to the land on each side.

Atchkaṭ, Ayacūṭ  Extent of land capable of being irrigated from an irrigation work.

Ayagar  Village officials consisting of 12 persons viz., Gauḍa, Śānbōg, Pañchāngī, Talvār, Tōṭi, Nīrgaṇṭi, Agasa, Nāyinda, Kumbāra, Lohār, Badagi and Agasale.

Bandī, Bhandie  A cart or conveyance.

Bārabalūti  Same as Ayagar.

Bijavāri  Area of land calculated according to the quantity of seed required for sowing in it.

Bittuvattā  Grant of land below the tank for constructing and maintaining it.

Chatra  A resting place for travellers.

Chauthāi  A fourth part.

Cuṭṭai  See Katte
Cōdi, Cōdy  The weir of a tank or a reservoir, waste-weir.

Caṇḍuga, Caṇdi  Land measure. See Khaṇḍuga.

Daśavanda  Land granted to a person for repairing or building a tank, same as Bittuvatā and Kattukodige.

Daṣtabund  Same as above.

Daṇa  A gift, Charity.

Dāmāshāyi, Dāmāsi  A proportionate share.

Devādāya  Lands endowed rent-free for temples.

Dewān  Minister.

Durg, Droog  A hill-fort.

Ēri  Bund of a tank in Kannada and a tank in Tamil.

Gadyāna  Half a sovereign.

Gaṇḍa, Gaṇḍa  Headman of a village; Head of the village police; Same as Paṭēl.

Hagēnu  A subterranean granary.

Hallā  A water-course, a river bed.

Hana  Money; a faṇam; a small coin of either gold or silver.

Hiṅgāru  The later rains, from October to January; the North-East Monsoon.

Hōbli  The subdivision of a tāluk.

Holē  A stream; a river.

Honnū  A gold coin.

Inām  A gift, reward, a grant of land or money by Government as a reward for services rendered.
Ināmti, Ināmati Free of tax or rent.

Ināmdār The holder of a rent-free grant.

Jāgir Rent-free lands granted for services rendered to Government.

Jamābandi The annual settlement made under the ryotwari system.

Jōdi Grant of land or village on light assessment varying according to circumstances.

Jō̄didār A ryot holding as Inām, lands or villages on reduced assessment.

Kachēri, Cutchēri An office, Court.

Kālave, Kāluve An irrigation channel.

Jō̄yisa An astrologer.

Kandi, Khanduga Land measure; 10,000 square yards of wet and garden land and 64000 square yards of dry land; Grain measure; 4 bushels, 12.8 pints.

Karnaṁ Village accountant; same as Shānbōg.

Kasbā The chief town of a district or a division.

Katte An anicut or dam across a river or stream, a pond.

Kattu kālve Feeder channel to a tank.

Kattu kōdíge Same as bittuvaṭta and dasavanda.

Kaul An agreement or contract.

Kere A tank.

Kodgi, Kodagi A gift.
**Koḍagidār**  A holder of a land under a tank, free of or on nominal assessment for having built, repaired or restored it.

**Kōḍi, Cōḍi**  The weir of a tank or reservoir; waste-weir.

**Kola**  A reservoir with stone steps down to water's edge.

**Kolaga**  One-twentieth of a *Khanduga*.

**Kunta**  A land-measure.

**Kunte**  A pond.

**Kūpa**  A well.

**Mahājana**  Scholar-citizens of an *agrahara* village.

**Maidān**  Plain country as distinguished from a hill region or *malnāḍ*.

**Malnāḍ**  Hill region.

**Māmledār, Amildār**  A collector.

**Māndal**  A subdivision of a zilla or district as defined in the Act.

**Maṇegār**  An agent, an accountant, an overseer.

**Mānya**  Exempt from taxes.

**Marāmat**  Mending or repairing, commonly used for the department of public works.

**Matha, Muṭṭ**  A school-house, seat of a religious head.

**Mēstri, Maistry**  A subordinate employed for supervising a work, an overseer.

**Mattar**  A land-measure, roughly equivalent of four to five acres.
Mirāsi An allowance or perquisite, sometimes paid in money and sometimes in kind, generally applied to grains etc., given to village officials by the ryots.

Mutchalike, Mutchalika A deed of agreement.

Mungāru The early rains, from June to September, the south-west monsoon.

Mutsaddi, Mutsuddy, An agent, an accountant.

Muzrāri A department for the control of temple funds, and other religious property.

Nādu A group of villages.

Nādagāudike Headship of a nādu or a group of villages.

Neerganti, Nirganti Regulator or distributor of water to irrigated lands.

Nibhanda Fixed or immovable property and also a fixed allowance.

Nirugandāya Water cess.

Pagāda A gold coin.

Paṇa, Haṇa Gold coin equal to 5.28 grains.

Panchāyat A village committee of five or more persons.

Pātel Headman of a village, same as Gaṇḍa.

Patnashetti A title given to the principal men of towns next to Shettis; a Shetti being in some respects similar to a Mayor and Patnashetti to an Alderman.

Patta A deed of lease given to the cultivator specifying the conditions of lease and details of land leased.

Pattana, Patna A town.
Glossary

Pēshkar  A revenue officer next in rank to Amildār.
Punya  Good lot or fortune or merit.
Reddi  A Telugu designation for the headman of a village.
Rāgi  Finger millet.
Ryot  A cultivator, a farmer.
Rāziname  A deed of consent.

Saluge, Salage  A measure of capacity, a khandūga, 160 seers.
Sanad  A grant, a document conveying to an individual emoluments, titles, etc, under the seal of the ruling authority.
Sante  A fair, a market place.
Sarkār  Government.
Sarvamānya  Land granted on entirely free tenure.
Šeer  Grain measure, a weight.
Sēnabōva  Village accountant.
Sētu, Sētuve  A bridge or dam.
Shānbhōg, Shānbōg  Village accountant, same as Senabova.
Shēkdār  Revenue officer in charge of a hobli or subdivision of a taluk.
Shikimdār  Sub-cultivator.
Shirastedār, Sheristedār  Head of a revenue or judicial office.
Shivāi Jame  Miscellaneous receipts credited to Government.
Shreya, Shraya Rent commencing at a low rate and increasing gradually year by year till the maximum is attained.

Supāri, Soopāri Arecanut.

Sowdie Same as Neerganti.

Talāri, Talāra, Talavāra Village watchman, whose duty is to give information to officers and to guide travellers.

Tāluk A division of a district under the management of an Amildar.

Tōti A deputy of Talari, who is employed to watch crops from the growing crop to the granary.

Tābu The sluice of a tank or reservoir.

Umbali A village or plot of land free of rent.

Vadda, Voddar A tank digger; a worker in stone or earth.

Varāha A gold coin, a pagoda.

Waddar Same as Voddar.

Yēta A lever for raising water from a well; a well from which water is raised by such an instrument.

Zilla Parishad District Assembly.

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“To my knowledge there was so far no treatise on the subject of ‘History of Irrigation Tanks’. The reason was simple: it needed painstaking research into history and insightful study to draw lessons. Both have been accomplished in ample measure by the authors. Tanks are a creation of the people, by the people and for the people. It is therefore necessary to have the book translated into Kannada”.

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