28

Irrigation Revenue Rates

28.1. Methods of Pricing Irrigation Water

When water is supplied to the cultivators for irrigating their crops, then naturally, it has to be charged and priced at some specified rate. This rate may be based either : (*i*) on flat rate basis ; or (*ii*) on the basis of the actual quantity of water consumed by each cultivator, as discussed below :

28.1.1. Flat Rate Pricing. When pricing of irrigation water is done on flat rate or crop rate basis, then the rates are specified per hectare of each crop sown and cultivated by the cultivators. Different rates for different crops are generally specified, depending upon the water requirement of the crop.

In other words, a crop requiring the highest quantity of irrigation water, such as sugarcane or Banana, will be priced at the highest rate ; whereas the crop requiring the lowest quantity of water, such as Paddy or Groundnut, shall be rated at the lowest rate. Different crops will, thus, generally be rated at reducing rates, with their reducing irrigation requirements, such as shown in Table 28.1 (*a*).

Table 28.1. (*a*) Water Requirements, and Specified Irrigation Water Rates for Different Crops in Maharashtra State of India (1990-data)

S.No.	*Name of the crop sown*	*Water required as depth of irrigation (Δ) in cm*	*Vol. of water required per ha of crop in m^3*	*Specified Irrigation Revenue Rate in Rs/ha of each crop.*
(1)	(2)	(3)	(4)	(5)
1.	Sugar-cane (*perennial*)	270	27,000	750/–
2.	L.S. Cotton (*Kharif-Ravi*)	90	9,000	400/–
3.	Vegetables (*Ravi*)	75	7,500	—
4.	Wheat (*Ravi*)	45	4,500	75/–
5.	H.Y. Maize (*Kharif*)	45	4,500	—
6.	H.Y. Jowar (*Kharif*)	22	2,200	—
7.	Paddy (*Kharif*)	20	2,000	50/–
8.	Groundnut (*Kharif*)	15	1,500	300/–

It can be seen from Col (5) of the above table that although the specified revenue rates are generally inaccordance with the general pricing formula of specifying higher rates for higher water requirement, yet there is a deviation in the case of ground-nut crop, which is priced at six times the rate of paddy, although its water consumption is somewhat lesser than that of paddy. One of the reasons for pricing groundnut at higher rate is the *higher earning capacity* of this crop, as compared to that of paddy, as shown in Col. (7) of table 28.1 (*b*).

Table 28.1. (*b*) Earnings provided by different crops in Maharashtra State (1990-Data)

Sl. No.	*Name of crop*	*Yield per ha in Qtl (100 kg) Qtl/ha*	*Sale price in Rs./Qtl*	*Gross income per ha in Rs./ha (3)×(4)*	*Estimated cost of cultivation (without accounting for irrigation charges in) Rs/ha*	*Net income in Rs/ha (5)—(6)*
(1)	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*
1.	Sugar-cane	865	30	25,950	12,450	13,500 (Max.)
2.	L.S. cotton	19	498	9462	5,002	4,460
3.	Vegetables	198	110	21,780	10,325	11,455
4.	Wheat	25	290	7,250	3,640	3,610
5.	H.Y. Maize	30	185	5,550	2,500	3,050
6.	H.Y. Jowar	27	200	5,400	2,530	2,870
7.	Paddy	37	215	7,955	4,644	3,311
8.	Ground nut	17	575	9,775	4,854	4921

Note. A comparison between Col. (5) of table 28.1 (*a*) and Col (7) of table 28.1 (*b*) will reflect that the specified irrigation revenue rates for different crops are varying between 2 to 9% of their earning capacities. It also reflects that the rates are highly beneficial to sugarcane, which is a highly earning crop.

It can, therefore, be concluded that the specified rates in a *crop rate system of pricing,* mainly depends upon two factors ; viz.

(*i*) *water requirement of each crop* ; and

(*ii*) *earning capacity of that crop.*

28.1.1.1. Demerits of the crop rate system. This method does not offer any incentive to the cultivators for economising in the use of water, since they will be charged at flat rate for the area of the crops grown. The cultivators will, therefore, never bother to avoid wastage of water, and will also try to use more and more quantity of water, under the wrong notion that more water will flourish their crops more.

This method, therefore, may lead to over-utilisation of water, particularly in command areas falling in the head-reaches of canals. *This may ultimately lead to water-logging and salinity of the irrigated lands, besides leading to the wastage of the precious and scarce irrigation water, which will ultimately cause scarcity of water at the tail reaches of the canal command, thus leading to unequitable distribution of water in the command area of the irrigation system.*

28.1.1.2. Fixed Assessment of grown crops in crop rate revenue system. The field assessment of the area of each crop grown by each cultivator is generally carried out and recorded by the area *Patwari* at the time of sowing, and also at the time of maturity and harvesting. At the end of the crop period, a *demand statement,* called **Khatauni,** for each cultivator is prepared.

The recorded measurements of crops carried out by Patwaris, are generally test checked by officers above Patwaris, such as *Tehsildars (Ziledars)*, SDM, *ADM (Revenue)*, etc, working under the Revenue Department of the Government. In States, where the engineers are also designated as canal officers, such powers are also vested in the hands of sub-divisional and divisional engineers. Checking of irrigated areas, thus, constitute an important part of the duties of engineers. In such cases, divisional engineers (*i.e.* executive engineers) will also have to raise the revenue bills against the cultivators by signing the Khatuni's on 31st June and 31st Dec. every year, for Ravi and Kharif crops, respectively.

In case of failure of crops or reduced production, due to reasons beyond the control of cultivators, full or part remissions can be granted by canal officers. Additional fines and levies may also be imposed by canal officers on cultivators, in case of unauthorised water use, or for damaging the outlets, or cutting the canal banks, or even for wasting water. The decision of the divisional canal officer is generally final and binding in all such cases, because his decisions can be appealed against only at a very high level, *i.e.* to the commissioner (Revenue division), who is normally a senior IAS officer above the Deputy Commissioner of the District.

28.1.2. Volumetric Method of Pricing. In this method, pricing of irrigation water is done on the basis of actual consumption of water by each cultivator, or by a chunk of cultivators, such as by a cooperative society of the cultivators.

This can be done only when measuring devices are installed at the outlets of irrigation minors or water-courses. The method, therefore, requires costly installations, like those of *water-meters* or *venturi-meters,* or *modular outlets.*

Due to the high installation and maintenance cost of such measuring devices as required in this system, this method of revenue assessment has generally not been adopted in our country. This method, therefore, although has its inherent advantages leading to economic use of water, does not find much practical use in India.

The method can be made use in assessing canal irrigation revenues, only if, Irrigation Departments supply water to cooperatives or Panchayats rather than dealing with the individual cultivators. If this can be achieved, then naturally, very less number of meters would be required and this system of charging can be implemented.

This method of pricing irrigation water, can of course, be used much easily in *tubewell irrigation,* where the billing can be done on the basis of number of units of electrical energy consumed in running a particular tubewell-supplying water to a particular chunk of cultivators. This method of charging by the number of electrical energy units consumed or by the number of running hours of the tubewell, is largely used where private tubewells supply water to the cultivators, although its use on Govt. irrigation supplies is still not being adopted on a large scale. The States have simply specified slightly different rates for lift irrigation supplies, and tubewell supplies are covered under those rates.

28.1.2.1. Merits and demerits of volumetric method. This pricing method offers its best merit of economical use of water, thus, avoiding the wastage of this preciously scarce commodity, and also avoiding water-logging and salinity of irrigated lands.

The *demerits* of this method are that :

(*i*) it requires costly measuring devices, atleast at each outlet head, and round-the-year-staff to maintain and look after these devices ;

(*ii*) it promotes unauthorised drawals of irrigation supplies, and also manipulation and mishandling of the measuring devices at the outlet heads ;

(*iii*) it forces the chunk of cultivators to pay equally in accordance with the water supplied at the outlet head, although the cultivators at the tail end of the water-course gets lesser supplies due to wastage of water enroute the length of the water course ; and

(*iv*) silt debris may retard the flow through the metered outlets.

28.2. Economic Water Rates Vs Prevailing Revenue Rates in India

We have stated earlier that in our country, the Govt revenue rates for irrigation waters are generally fixed by considering ; (*i*) *The water requirement of the crop* ; and (*ii*) *the earning capacity of the crop*. However, the most important factor, *i.e. the real cost of the irrigation water,* is generally being ignored.

This real cost of the water can be worked out on *Economic considerations,* by computing the cost of the irrigation project, and recovering the same during its effective life span, along with costs of interest and annual operating and maintenance charges of the irrigation system. Such a rate, when worked out in terms of Rs. per unit quantity of water obtained, is known as the *economic water rate.*

Such a rate will evidently depend upon *the cost of the irrigation project, its effective life span, the rate of interest considered on the investment, and actual O and M charges on the system.* The *annual recovery factor,* computed on Economic considerations as explained in chapter 12 of "Hydrology and Water Resources Engg"., can, thus, give us the cost of irrigation water per year from a particular project, and it can finally be used to work out the unit cost of such water.

Such economic water rates have been computed to be generally much higher than the rates being changed by the government bodies in the country.

For example, economic water rate on a typical tubewell minor irrigation project, in Gujarat State has been computed to be Rs. 0.30P per kilolitre (on 1990 rates) as against the rate being charged by the State Tubewell Corporation @Rs. 0.18P per kilo litre. Similarly, for a typical interstate minor lift irrigation scheme, executed in Gujarat and Orissa States, the economic rate has been worked out to be Rs. 1.53P per kilolitre (on 1990 rates), as against the rate of Rs. 0.18P per kilolitre being charged by the Gujarat State Corporation, and Rs. 0.02P per kilolitre being charged by the Orissa State.

It has thus, generally been seen that the rates, being charged by the Govt. Corporations or State Irrigation Departments, are *highly subsidised* and *too low* incomparison to the actual cost of water. *So much so, that the rates being charged are not even capable to repay the O* and *M charges alone, what to talk of recovering the capital investment on the project.*

Considering the urgent necessity of improving the rates, so as to reduce the heavy losses and subsidies, being incurred by the Government in the operations of irrigation systems, the newly framed *National Water Policy (1987),* has specified that :

"The irrigation water rates should be such as to convey the scarcity value of resources to the users, and to fasten the motivation for economy in water use. *The revenue rates should, therefore, be adequate to recover the annual operation and maintenance charges and a part of the fixed capital cost.* Efforts should be made to reach this ideal, over a period of time, while ensuring the assured and timely supplies

of irrigation water. The water rates for surface water and ground water should be rationalised with due regard to the interests of small and marginal farmers".

From the above, it can be seen that the built in requirement of the National policy is that the water rates should recover annual R and M charges and part of the capital cost, if not the full cost. Even if for the time being, we neglect recovering of the capital cost, we must rationalise our irrigation revenue rates in such a fashion as to fully recover our annual running and maintenance expenditure on the irrigation systems.

It has, however, been computed that the average annual irrigation revenue realisation in the country is only about 12% of the total O and M expenditure alone, with Statewise variation ranging between 32% in Delhi to 0.11% in Nagaland with Punjab not collecting any revenue at all, since it has totally abolished water charges for irrigation water supplies wef Feb. 1997.

There is, therefore, an urgent need to reconsider and revise the water rates, even at the cost of inflation and possible rise in the rates of crops.

At present, different revenue rates are prevailing in different States of the country even for the same crop ; and even in the same State, different rates are prevailing for different irrigation systems. There is no uniform method of computing the revenue rates ; and the rates are generally being decided and guided by the whims and fencies of the political powers. A few examples of the non-uniformity and irrationality prevailing in our present revenue rates, are highlighted below :

In Gujarat State, the revenue rates for lift irrigation on canals are $\frac{1}{2}$ times, and on rivers and reservoirs $\frac{1}{3}$rd times the flow irrigation rates, provided the water is lifted by the cultivators at their own cost. In Maharashtra, the water rates for all types of lift irrigations to $\frac{1}{10}$th times (when cost of lifting is met by cultivators) are hardly $\frac{1}{5}$th to $\frac{1}{10}$ times the rates prescribed for flow irrigation. In Haryana State, the rates are reduced only to $\frac{1}{2}$ times of the flow irrigation rates, when water is privately lifted from any State irrigation work. In Jammu and Kashmir State, the rates prescribed for lift irrigation (cost of lifting is met by Govt.) are about 15 times the rates prescribed for flow irrigation ; whereas, in Kerala, the prescribed rates for such Govt. lift irrigation schemes are only about $1\frac{1}{2}$ times the rates for flow irrigation. States of Andhra Pradesh, Assam, Bihar, Chhatisgarh, Jharkhand, Karnataka, Madhy Pradesh, Tamil Nadu & West Bengal have not prescribed any separate rates for lift irrigation, and flow irrigation rates remain applicable to lift irrigation rates also. The State of Punjab has completely abolished the water rates wef 14.2.1997. While Himachal Pradesh has levied extremely low rates — lowest amongst all the States. Besides Punjab, some other States like Arunachal Pradesh, Sikkim, Meghalya, Mizoram, and UT's like Andaman and Nicobar Islands, Chandigarh and Lakshadweep have also not levied any irrigation revenue rates, so far, although the States of Sikkim and of Arunachal Pradesh are in the process of introducing such rates.

While the rich-farmers State like Punjab has completely abolished the irrigation revenue rates, the progressive States of Maharashtra and Gujarat have not only revised their water rates in the year 2001, but have also made an inbuilt provision of automatic

annual increase in their notified rates. Say for example, the Maharashtra State has specified a uniform 15% annual increase over the rates notified on 1.9.2001. Similarly, the Gujarat State has provided for 25% annual increase in notified water rates of Paddy, and 15% annual increase in rates notified for all other crops wef 16.2.2001.

It can also be seen from Table 28.2 that certain States and UT's like Andhra Pradesh, Delhi, Goa, Himachal Pradesh, J & K, Karnataka, Kerala, Manipur, West Bengal, etc. have not revised their irrigation revenue rates for the last more than 10 to 50 years. NCT of Delhi is in worst condition in this respect, as it has not revised its rates since the year 1951. There is an urgent need for revision of the water rates in all such States.

Table 28.2. Table Showing the Dates on Which Irrigation Revenue Rates were Last Notified in Various Indian States

State	Date on which irrigation revenue rates were last notified	State	Last date on which irrigation revenue rates were notified
Andhra Pradesh	7.1.1196	Maharashtra	1.9.2001
Assam	30.3.2000	Manipur	Year 1977-78
Bihar	Nov. 2001	Mizoram	Not specified
Chhattisgarh	15.6.1999	Orissa	5.4.2002 for flow irrigation July 1997 for lift irrigation
Delhi	Year 1951	Punjab	Abolished wef 14.2.1997
Goa	11.2.1988	Rajasthan	24.5.1999
Gujarat	16.2.2001	Tamil Nadu	6.11.1987
Haryana	27.7.2000	Tripura	Yet to start
Himachal Pradesh	Year 1977	U.P.	18.9.1995
J & K	1.4.1976	Uttaranchal	18.9.1995
Jharkhand	14.11.1995	West Bengal	6.4.1997
Karnataka	1.7.1985	Andaman and Nicobar Island	1.11.1992
Kerala	18.9.1974	Dadar and Nagar Haveli	29.1.1996
Madhya Pradesh	15.6.1999	Daman and diu	Year 1980

The prevailing irrigation water rates in different States of the country, for flow irrigation are compared in Table 28.3; while those for lift irrigation are compored in table 28.4.

With a view to rationalise the irrigation water rates in different states, the planning commission, Govt. of India, appointed a "*Committee on Pricing of Irrigation Water*", vide notification dated 23-10-1991, under the chairmanship of Dr. A. Vaidyanathan, Professor of Madras Institute of Development studies and former Member of Planning Commission, with 16 members from Central Water Commission (CWC) and Other State Governments. This committee has submitted its report in September, 1992. But the same appears to have not yet been implemented. Some of the important recommendations of this Committee are briefly pointed out in article 28.3.

Table 28.3. Comparison of Prevailing Irrigation Revenue Rates (Maximum) in Various States of India for Flow Irrigation

Water rates for flow irrigation in Rs. per hectare of each crop grown

S.No.	Name of State	*Rice or paddy (Kharif)*	*Sugarcane*	*Wheat*	*Cotton*	*Oil seeds*							*Barley*	*Maize*
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
1.	Andhra Pradesh	494	494	—	494	494	494	—	—	—	—	—	—	—
2.	Assam	281	222	563	—	99	—	—	—	150	—	—	—	—
3.	Bihar	217	371	185	—	247	99	148	—	99	—	99	148	—
4.	Chhatisgarh	494	741	200	371	247	247	494	247	247	494	247	494	—
5.	Delhi (NCT)	99	—	45	—	30	—	89	—	—	—	—	44	30
6.	Goa	150	300	—	—	100	—	100	100	—	—	—	—	60
7.	Gujarat*	300	2750	240	275	440	130	220	440	—	330	90	—	90
8.	Haryana	148	197	124	124	124	99	148	86	—	148	99	124	86
9.	Himachal Pradesh	24	41	7	17	16	12	8	—	—	21	11	16	14
10.	Jammu and Kashmir	49	49	25	—	25	20	37	—	—	—	—	—	25
11.	Jharkhand	109	371	185	—	99	99	185	—	99	—	99	185	—
12.	Karnataka	247	988	148	148	—	—	—	148	—	87	—	—	87
13.	Kerala	99	—	—	—	—	—	—	—	—	—	—	—	—
14.	Madhya Pradesh	200	741	200	371	—	247	494	247	—	494	247	494	—

Contd....

* With annual increase of 25% for Paddy and 15% for other crops since 16.2.01.

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
15.	Maharashtra*	180	4763	360	280	548	—	270	548	—	—	—	—	—
16.	Manipur	38	—	38	—	23	23	23	—	—	—	—	—	—
17.	Orissa	—	500	170	—	170	170	280	170	84	420	—	—	140
18.	Punjab	Charges abolished wef 14.2.1997												
19.	Rajasthan	114	247	148	178	114	79	109	—	—	178	182	79	67
20.	Tamil Nadu	37	49	—	62	—	—	50	—	—	49	—	—	—
21.	Tripura (Proposed rates)	—	—	313	—	—	313	313	313	—	—	—	—	—
22.	Uttar Pradesh	287	474	287	114	—	—	287	—	—	306	—	287	—
23.	Uttaranchal	143	—	143	—	—	—	—	—	—	153	—	—	—
24.	West Bengal	37	—	49	—	—	—	—	—	—	—	—	—	—
25.	U. Ts													
	(*a*) Dadra and Nagar Haveli	140	830	—	—	—	—	110	—	—	—	—	—	—
	(*b*) Daman and Diu	200	—	—	—	—	—	—	—	—	—	—	—	—

* With annual increase of 15% wef 1.9.01

Note. States which have not levied any irrigation revenue charges so far, have not been included in this table.

Table 28.4. Comparison of Prevailing Irrigation Water Rates (Maximum) in Various States of India for Lift Irrigati

Water rates for Lift irrigation in Rs per hectare of each cnp grown

S.No.	Name of State	*Rice or paddy (Kharif)*	*Sugarcane*	*Wheat*	*Cotton*	*Oil seeds*	*Pulses*	*Vegetables*	*Groudnut*	*Jute*	*Tobacco*	*Gram*	*Barley*	*Maize*
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
1.	Andhra Pradesh*	494	494	—	494	494	494	—	—	—	—	—	—	—
2.	Assam*	281	222	563	—	99	—	—	—	150	—	—	—	—
3.	Bihar*	217	371	185	—	247	99	148	—	99	—	99	148	—
4.	Chhatisgarh*	494	741	200	371	247	247	494	247	247	494	247	494	—
5.	Delhi (NCT)	148	—	67	—	45	—	133	—	—	—	—	67	44
6.	Goa	300	600	—	—	—	120	200	200	—	—	—	—	120
7.	Gujarat**	170	420	100	90	180	55	90	90	—	—	45	113	35
8.	Haryana	74	99	62	62	—	49	74	43	—	74	49	62	43
9.	Himachal Pradesh	49	82	29	32	32	24	32	—	—	41	29	32	28
10.	Jammu & Kashmir	247	716	124	—	—	—	—	—	—	—	—	—	—
11.	Jharkhand*	109	371	185	—	99	99	185	—	99	—	99	185	—
12.	Karnataka*	247	988	148	148	—	—	—	148	—	87	—	—	87
13.	Kerala	149	—	—	—	—	—	—	—	—	—	—	—	—
14.	Madhya Pradesh*	200	741	200	371	—	247	494	247	—	494	247	494	—

Contd....

* Separate rates for Lift irrigation are not given, and hence rates shown are the same as for flow irrigation.

** Specified rates here are for lift irrigation done by cultivators at their own cost from canals & irrigation projects.

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
15.	Maharashtra	—	495	—	100	—	—	—	100	—	—	—	—	—
16.	Manipur	38	—	38	—	—	23	23	—	—	—	—	—	—
18.	Mizoram	No water rates are in Vogue												
17.	Orissa	516	1398	646	861	345	215	1292	684	430	1034	—	—	—
18.	Punjab	Charges abolished wef 14.2.1997												
19.	Rajasthan	395	573	296	356	227	158	217	—	—	356	207	158	133
20.	Tamil Nadu*	37	49	—	62	—	—	50	—	—	49	—	—	—
21.	Tripura (Proposed rates)	—	—	—	—	—	—	—	313	313	—	—	—	—
22.	Uttar Pradesh	143	237	143	57	—	—	143	—	—	153	—	143	—
23.	Uttaranchal	287	—	287	—	—	—	—	—	—	306	—	—	—
24.	West Bengal*	37	—	49	—	—	—	—	—	—	—	—	—	—
26.	U. Ts													
	(*a*) Dadra and Nagar Haveli	75	100	100	—	—	100	275	—	—	—	100	—	—
	(*b*) Daman and Diu*	200	—	—	—	—	—	—	—	—	—	—	—	—

* Separate rates for Lift irrigation are not given, and hence rates shown are the same as for flow irrigation.

nt Recommendations of the Committee on Pricing of Irrigation (1992)

s 3.11 and 3.12. A revision in the level and structure of water rates is, thus, necessary in the interest of both efficiency and equity. The revision should be such as to achieve full cost of recovery in due course and in the process promote saving, create disincentives for waste and thereby enable the service area to be expanded and more reliable service assured.

(2) **Paras 3.13 and 3.16.** Revision of water rates should go hand in hand with measures to improve the quality of service and to keep a check on costs.

(3) **Paras 3.54 and 3.56.** The objective of the *first phase* should be to rationalise and simplify the existing system of assessment (based on cropwise irrigated area on an individual basis) to a system of season-specific area rates. It is possible to estimate the relative water consumption per hectare irrigated in different seasons. The variable part of the tarrif in the case of major and medium projects and such of these minor works as are still under State management should be fixed on this basis. *We should urge that all minor systems be turned over to users immediately after completion.* Both categories of projects will pay a flat basic rate per ha. *The level of cost-recovery to be aimed at the first phase should at least cover the O and M costs and 1% interest on capital employed.*

(4) **Para 3.57.** Irrigated area under a crop which spreads over two seasons will be charged at the rates applicable to both seasons, and perennials for all three seasons ; but crops like paddy which take a lot of water for non-consumptive uses need specific treatment. Where paddy is a significant but not a dominant crop, some differentiation may have to be made. In each season, therefore, we need to distinguish at best three categories, viz. paddy, sugarcane, and, perennials and other crops.

(5) **Para 3.58.** In the *second phase* to be implemented in the course of the next decade, the aim would be to shift to a fully volumetric system. Additional investments to modify the distribution system for effective regulation of volume delivered at outlets (estimated at approximately Rs. 5,000 crores) will be needed. As system efficiency and productivity improve, the targets of cost recovery can be progressively increased.

(6) **Paras 3.59 and 3.61.** There are many important matters of detail to be decided in shifting to the volumetric system of charging. These are best decided in consultation with user's representatives. *The most crucial and also the most difficult task in this phase will be to promote the creation of sufficiently large farmer's groups.*

(7) **Para 3.62. Phase III,** which will spread over a much longer period should seek to extend and consolidate the system of farmer group management, and implement, with the involvement and participation of such groups, a programme for upgrading the system to a higher level of efficiency in water use and therefore of productivity. Besides substantial investments in conjunctive use and distribution networks, the techniques of water management will have to become tighter and more sophisticated.

(8) **Para 4.5.** There is a case for earmarking the whole or a substantial part of the receipts from each irrigation system towards the operation and maintenance of that system. *In the long run, there is a case for moving towards the conversion of each irrigation system into an independent self-financing system, whether through the formation of corporations or otherwise.*

(9) **Paras 4.9 and 4.10.** We recommend that States set up special expert groups to work out appropriate norms and a procedure for periodic monitoring and updating for different agro-climatic regions and broad categories of projects.

(10) **Para 4.26.** The States should form a high-powered autonomous Board which may be called "Irrigation and Water-Pricing Board" to review the policy, establish the norms regarding maintenance costs for various components and staff costs, assess the actual expenditure in relation to these norms, and determine the parameters and criteria for revising water rates. There should be a mandatory review of all these matters every five years with an opportunity for users to present their views.

(11) **Paras 5.1 and 5.2.** Among the various problems faced in the matter of assessment, unauthorised irrigation and the incorrect reporting of crops & irrigated areas are the major ones. *There are also delays in raising demands. In spite of low and subsidised water rates, actual revenue recoveries are substantially below the demands. Large arrears have been allowed to accumulate and these tend to be eventually written off.* The existing mechanisms for preventing unauthorised, excessive and wasteful use of water as well as for the recovery of outstanding dues have not proved very effective. Lack of coordination among different agencies involved in assessment and collection also aggravates the problem.

(12) **Paras 5.9. and 5.15.** There is considerable diversity in the mechanism for the assessment and collection of irrigation revenues. The limited data that we have seen suggest that the ratio of accumulated arrears to annual demand is generally much higher in States where the Irrigation Department is responsible for both the assessment and collection than in States where both functions are vested in the Revenue Department or where they are divided between the Irrigation and Revenue Departments. *Having considered the matter, the committee is of the view that the assessment function is best entrusted to the Irrigation Department. As for collection, States may choose one of two options — (1) entrusting both assessment and collection to the Irrigation Department, and (2) making the Irrigation Department responsible for assessment and the Revenue Department for collections — in the light of their specific circumstances and experience. Where alternative (1) is preferred, it would be necessary to empower the Irrigation Department officials to recover arrears of irrigation dues under the Revenue Recovery Laws.*

(13) **Paras 5.16 and 5.18.** The Committee would like to emphasise the need for purposive and strong measures to ensure the accurate assessment of irrigation charges and their prompt and full collection. We suggest that a regular system of independent verification of actual irrigation on a sample basis be introduced on all major and medium project commands. At the same time, we strongly recommend that a serious effort be made by the Irrigation Departments to use remote sensing as an independent source of information on irrigated area, which can be used along with sample verification to test the veracity of records maintained by the field staff. Such independent checks linked to a system of penalties for inaccurate (and rewards for accurate) recording would minimise the loss from under-assessment.

(14) **Para 5.19.** We are of the view that the practice of waiving or suspending collections of irrigation charges on account of drought is not justified in respect of areas actually irrigated.

(15) **Paras 5.20 and 5.21.** The reluctance of the governments to support the agencies concerned in enforcing the regulations has led to a situation in which these agencies have practically given up even raising demands for betterment levies. Very little is done to take cognizance of the widespread violations of rules and even less to enforce what

little penalties are levied. We need hardly emphasise that such laxity has serious consequences not just in terms of revenue but for the efficient management of the system.

(16) **Para 5.22.** With a view to improving collections, the States should consider switching from the existing system of supplying water on credit to one of supply against advance payment. The collection performance relative to demand should be an important consideration for deciding the allocation of O and M funds to individual systems. We also recommend that proceeds from the collection of accumulated arrears from a system be used for making up the cumulative effects of past neglect in the maintenance of that system.

(17) **Paras 5.23 to 5.25.** Until a system of group assessment on a volumetric basis is introduced, the State agencies will need to verify and record the area irrigated by plots in order to determine the dues from individual farmers. The proposed system of season-hectare assessment (*i.e.*, assessment on the basis of area irrigated in each season) will substantially simplify the task. In the case of minor surface works, since assessment will be at a flat rate per hectare of command, there is no need for recording cropwise area irrigated for the assessment of water rates.

(18) **Para 5.26.** The aim should be to increase user participation in management initially at the level of distributaries and minors, and in due course at the level of the system as a whole. Each system should become an autonomous entity which manages its own finances both for operation and eventually for the expansion/improvement of facilities.

(19) **Para 7.1 to 7.6.** For the purposes of illustrating the application of the suggested approach to the revision of water rates, if we use the norm suggested by the Jakhade Committee, namely, Rs. 180 per ha. gross irrigated area, with adjustments for inflation since 1987 and for departmental overheads at 25 per cent of the norm so adjusted, and add interest @ 1% on capital, *the total recovery in Phase I should average around Rs. 340 per ha.* As against this, the estimated gross receipts from major and medium projects in 1989-90 was Rs. 68 ; the actual irrigation revenue works out in 1989-90 to Rs. 50 per ha. Assuming conservatively the additional revenue on account of an increase in the rates for industrial use at Rs. 10 per ha, **the recovery from irrigation charges in Phase-I has to be Rs. 310 per ha compared to the present realisation of Rs. 50 per ha.**

(20) **Para 7.9.** A basic levy at the rate of Rs. 50 per ha is recommended for all lands in the cultivable commands of major and medium as well as minor works. This is intended as a fee for the right to get water from the system (a sort of "demand charge").

(21) **Para 7.10 to 7.12.** The rate per unit of water needs to be equalised across crops. The additional revenue through such rationalisation will be sizeable, the increase ranging from 18 per cent to 140 per cent of the revenues at current rates if the per ha. cm. rates for all crops are made equal to the irrigation rate now charged for ID crops, and from 50 to 325 per cent if they are made equal to the highest irrigation rate per ha.cm.

(22) **Para 7.13.** The level of rates will also have to be raised. The extent of increase required, depending as it does on the potential for rationalisation, cannot be quantified. It is also likely to vary from States to States. Nevertheless, on the average, the required revenue by way of irrigation charges (Rs. 310 per ha) will still be barely 6% of the gross produce per hectare of the irrigated area, and that without taking any account of likely improvements in productivity.

(23) **Para 7.15.** As a measure of inducement for farmer's groups to take over greater responsibility, we suggest that when the proposed revisions are implemented, the rates

for group delivery be fixed at substantially lower levels than for individual delivery, while keeping the basic fee of Rs. 50 per ha. common.

(24) **Para 7.22.** The implementation of the approach suggested here will require expeditious action on the part of each State to set up task forces, with adequate expert staff and authority for collecting the necessary data, to determine *O* and *M* norms by region and category of projects ; undertake sample studies in the field to determine the extent of under-assessment and under-collection at existing rates ; determine the per hectare rates applicable to paddy and other seasonal crops by season and for perennials in terms of volume of irrigation required and costs connected with carry-over between seasons ; and work out the existing and projected use by non-agricultural users and determine the rates to be charged to such users, the appropriate contractual arrangements, and other relevant details.

The committee report, however, appears to be lying in the waste paper baskets, of the States, and the States are simply not inclined to take politically inconvenient decisions of increasing the water rates. Let us appeal to the politicians of this country to forget their political benefits infront of the overall benefits of the country.

PROBLEMS

1. Discuss the two important methods, which are used to price the irrigation water supplies for collecting irrigation revenues. Compare the merits and demerits of both these methods. Also discuss as to which of these two methods is generally being used in our country and why.

2. (*a*) Explain the various points which need to be considered while fixing irrigation water rates.

(*Pune Univ. May 1995*)

(*b*) Explain the crop rate basis of assessment of water charges. State the other method.

(*Pune Univ. Nov. '95*)

3. (*a*) Enumerate the merits and demerits of volumetric assessment of water charges.

(*Pune Univ. Nov. '96*)

(*b*) How have the irrigation revenue rates been fixed in India ?

Compare the irrigation revenue rates prevailing in different States of India, explaining the urgent necessity of revision of these rates. What has the GOI done to effect this revision and/or to switch to volumetric assessment system.

4. (*a*) "The revenue rates for canal irrigation water should differ from the revenue rates for lift irrigation supplies". Critically discuss this statement in special reference to Indian States.

(*b*) Point out the major recommendations of the Expert Committee, constituted by GOI in 1992, for revision of irrigation revenue rates.