No.12/08/2018-CWRCS/21-36

Cauvery Water Regulation Committee Secretariat

Office: O/o Chief Engineer, Yamuna Basin Organisation, CWC,
Kalindi Bhawan, B-5, Tara Crescent Road, Qutub Institutional Area, N. Delhi 110016.

Dated: 24th July, 2018

Subject: Minutes of Second Meeting of Cauvery Water Regulation Committee (CWRC) held on 19thJuly, 2018, at New Delhi.

Please find enclosed herewith the Minutes of the Second Meeting of Cauvery Water Regulation Committee, held on 19th July, 2018, at Central Water Commission, New Delhi.

Enclosure: as above (35 pages)

Sd/-
(A. S.Goel)
Member Secretary, CWRC
Tele-fax: 011-26526865
Email: ceybo-cwc@nic.in

To:

1. Sh. Navin Kumar, Chief Engineer, IMO, CWC/ Chairman,CWRC,[ceimo-cwc@nic.in]
2. Sri H L Prasanna, MD, Cauvery Niravari Nigam Ltd, Govt of Karnataka [cnnlmd@yahoo.com]
3. Sri K.A. Joshy, Chief Engineer, lSW Govt. of Kerala, [cea.irrgn@kerala.gov.in]
4. Sri V. Shanmugasundaram, Chief Engineer, PWD, Govt. of Puducherry, [cepwd.pon@gov.in]
5. Sri. R. Senthil Kumar , Chief Engineer, WRD, Govt. of TN, [cetrydb@hotmail.com]
6. Dr. M. Mohapatra,Scientist G (Services), IMD, [mohapatraimd@gmail.com]
7. Sri N.M.Krishnanunni, Chief Engg., C&SRO, Coimbatore , CWC, [cecsro-cwc@nic.in]
8. Dr.B.N.SrinivasMurthy,Commissioner (Horticulture), MoA&FW, [bns.murthy@gov.in]

Copy for kind information to:

9. Sh. S.Masood Husain, Chairman CWMA/ CWC. chairman-cwc@nic.in
10. Sh. Sanjay Kundu, Joint Secretary (RD&PP), Min. of WR, RD & GR. jspp-mowr@nic.in
11. Dr. S.K. Malhotra, Commissioner (Agriculture), M/o A&FW. ag.comm@nic.in
12. Dr. B. Kishore, Jt Secretary (RFS), D/o Agriculture, Coop and Farmers' Welfare. jsrfs-agri@gov.in

Contd....

13. Shri Rakesh Singh, Principal Secretary, WRD, Govt. of Karnataka.
14. Smt. Tinku Biswal, Secretary, WRD, Govt. of Kerala.secywrd@gmail.com
15. Sh. A. Anbarasu, Development Comm-cum-Secretary (Public Works), Government of Puducherry.dc.pon@nic.in
16. Sh. S.K. Prabakar, Principal Secretary, Public Works Deptt., Govt. of Tamil Nadu pwdsec@tn.gov.in

MINUTES OF SECOND MEETING OF CAUVERY WATER REGULATION COMMITTEE HELD ON 19.07.2018.

The second meeting of Cauvery Water Regulation Committee (CWRC) was held under the chairmanship of Sh. Navin Kumar, Chief Engineer (IMO), CWC and Chairman, CWRC on 19th July, 2018, at 11:30 Hrs at Sewa Bhawan, Central Water Commission, New Delhi. List of participating members is enclosed as **Annex-I.**

At the outset, the Chairman of the Committee welcomed the participants. It was noted that the members from Karnataka,Tamil Nadu and Kerala have provided written submissions for the meeting, copies of which are annexed as **Annex-II, Annex-III, and Annex-IV** respectively. It was also noted that the Govt. of Karnataka authorized Sh. M. Bangaraswamy, Chief Engineer (ISW), Water Resources Development Organisation, Bengaluru to attend this meeting. After the welcome address by the Chairman, the member from Tamil Nadu read his opening remarks, a copy of which is enclosed at **Annex-V**. Subsequently the agenda items were taken.

Agenda 2.1Hydro- meteorological situation in Cauvery basin

The prevailing hydro-meteorological situation in Cauvery Basin was discussed. On the basis of information furnished by Member States, a consolidated table indicating the Storage, Inflow, Outflow and Withdrawal of 8 reservoirs in Cauvery Basin as on 18th July, 2018 is at **Annex-VI**. Further, the rainfall details for 1-10th July, 2018, in each of the sub-basins, as provided by IMD, was discussed, a copy of which is placed at **Annex-VII.** It was noted with satisfaction that the performance of South West Monsoon 2018 had been satisfactory in the Cauvery basin and till the date of meeting, there was no sign of any distress in any of the sub-basins. The Chairman requested a close watch by the Members on the situation.

The representatives of Karnataka and Kerala desired some modifications in the data pertaining to hydro-meteorological conditions circulated as an annex-IV of the minutes of first meeting of CWRC. The Committee took note of the same.

The member from IMD was requested to include the figures of monthly cumulative rainfall and cumulative rainfall from the beginning of the season (with

effect from 1st June, 2018), in the 10-daily information being disseminated for the perusal of the Committee, which was agreed to by the member from IMD.

Chief Engineer, C&SRO, CWC informed that initially, there were some issues on dissemination of information about the flows at Billigundulu site of CWC on weekly offs and holidays, but the same has now been addressed and the information was being shared by CWC with Members of the Committee by email on daily basis. The Committee noted the same with satisfaction.

(Action: IMD)

Agenda 2.2Finalisation of formats circulated during 1st Meeting

The four formats circulated as a part of minutes of the first meeting, were taken up for discussions. In this regard, the suggestions submitted by the States of Karnataka, Tamilnadu and Kerala, as per **Annex II, III and IV** respectively, were also discussed in detail.

In this regard, Member from Karnataka reiterated their written reply to agenda item no. 2 (Annex III). The representative of Tamilnadu was of the view that the legal points raised by Karnataka had already been argued before the Hon'ble Supreme Court, and the Hon'ble Supreme Court has delivered its decision and the CWRC is not the forum to raise the same point again. He further stated that:

"As far as the format was concerned, the objections that the indent need not be placed for, was not acceptable as it was against the spirit of notification of GOI dated 1.6.2018. The indent has to be placed before the CWRC, irrespective of the year being normal or deficient, or surplus in order to decide the release from the respective reservoirs for irrigation."

The Member from Puducherry appreciated the need for placing the indent with the flexibility to alter it subsequently based on the realization, monsoon and cropping pattern, and informed that he was agreeable to the formats circulated to arrive at the actual needs.

The representative from Kerala had no objections on the sheet 1 (Annex vii of minutes of first meeting), but felt that the irrigation demand should be placed month-wise in the beginning of the year, and not on 10 daily basis.

Member (Agriculture) of CWRC opined that the crop to be grown have to be arrived at in the beginning of the season, based on which the water requirement of these crops would be better estimated and projected on 10-daily basis.

After detailed deliberations, the following decisions were taken by the Committee:

a. **Format for maintaining data of inflow and outflow of the reservoirs (Annex-VI of the minutes of first meeting):** The format was accepted unanimously in the meeting, with the minor change of removing the columns no. 8 (active initial storage), and column no. 18 (active final storage) and mentioning dead storage figure at the top of the format. The final format as accepted in the meeting is placed at **Annex-VIII.**

b. **Format for crop-wise water requirement sheet -2 (Annex-VII of the minutes of first meeting):** After deleting the remarks column, the format was accepted unanimously in the meeting. The final format as accepted in the meeting is placed at **Annex-IX.**

c. **Format for crop-wise water requirement (Annex-VIII of the minutes of first meeting):** The format was accepted with a note of dissent from Karnataka, as per their written submissions placed at **Annex-III**. However, it was decided that instead of 10-daily breakup of water requirement, the same may be kept on monthly basis. The final format as accepted in the meeting is placed at **Annex-X.**

d. **Format for Domestic/ Industrial demand (Annex-IX of the minutes of first meeting):** The format was accepted unanimously in the meeting. However, it was decided that instead of 10-daily breakup of water requirement, the same may be kept on monthly basis. The final format as accepted in the meeting is placed at **Annex-XI.**

It was decided that the above accepted formats be forwarded to CWMA, for their consideration.

(Action: Member Secretary, CWRC)

Agenda 2.3Any other item with the permission of the Chair

2.3.1 Discussions on Yield Assessment:

Govt. of Karnataka submitted that the yield calculations has to be done at Mettur, Amaravathi, Upper Bhawani Sagar, Lower Bhavani Sagar and Grand Anicut in Tamilnadu, and Banasurasagar in Kerala, in addition to the points suggested by

Tamilnadu at para 1.2 of their written submissions for this meeting, namely Krishna Raja Sagar (KRS), Kabini, Billigundulu and Lower Caleroonanicut. Govt. of Kerala representative desired yield calculations at Kalkandiyor and Kottathara in Bhawani basin.

Tamilnadu representative submitted that at the first instance, the calculation of yield may be limited to major points like KRS, Kabini, Billigundulu and Lower Caleroon Anicut. Subsequently, after watching the progress in assessing the yield, additional points like Harangi reservoir, Hemavathy reservoir and other points suggested by the states of Karnataka and Kerala may be considered for assessing the yield.

After detailed deliberations, the Committee unanimously decided to recommend to the CWMA that the yields assessment may be done at all the above points/reservoirs proposed by Karnataka, Tamilnadu and Kerala viz. Banasurasagar, Kabini, Harangi, Hemavathy, KRS, Billigundulu, Mettur, Amaravathi, Upper Bhawani Sagar, Lower Bhavani Sagar, Grand Anicut, Kalkandiyor and Kottathara.

The Member from Tamilnadu was of the view that last ten good / normal years meteorologically may be considered for calculating the yield of previous years. In this context, the representative of Karnataka submitted that ignoring yield in surplus and deficit years will not reflect the basin behavior in the time series. Therefore, the yield series will have to be prepared for 30-years to reflect surplus, normal and deficit years. The discussion remained inclusive and therefore postponed for discussion in the subsequent meeting of the Committee.

However, the requirement of data for assessment of yield which was indicated in the minutes of the first meeting under agenda item 1.2 was unanimously accepted.

(Action : Member Secretary, CWRC)

2.3.2 Procedure for compilation and reconciliation of monthly water account for each reservoir

The Member from Tamilnadu circulated a detailed procedure being followed in case of Mettur, Bhavani and Amaravathi reservoirs, which was duly circulated by the Member Secretary to all the Members.

In this regard, the attention of Members was drawn to the first meeting of CWRC held on 5th July, 2018, whereby it was decided that the Members from the

three Party States (TN, Karnataka & Kerala) would provide the status report on the equipments available and the procedures presently adopted by them to all the members of the Committee in 10 days' time. The Member from the IMD would convey recommendations of IMD on the procedure to be adopted, within two weeks, which would subsequently be discussed by the Committee for evolving a common procedure to be adopted by the Party States. The requisite inputs were not received from Karnataka.

The representative of Karnataka was requested to provide the information at the earliest so that by the next meeting response from IMD is also available. Thereafter, the issue was proposed to be included in the agenda item in the subsequent Committee meetings.

(Action :Karnataka, IMD, Member Secretary CWRC)

2.3.3 Inflow calculations to major reservoirs of Karnataka:

The Member from Tamilnadu made the following submission about the issue of net inflow calculations:

> "*At present the net inflow in the four major reservoirs of Karnataka is being worked out by Karnataka as, total inflow of four major reservoirs minus river outflow of Harangi and Hemavathy. The outflow of Harangi and Hemavathy reservoirs flows to KRS only. Hence, the correct procedure would be, to calculate the net inflow into KRS separately, i.e., KRS inflow (-) Harangi outflow (-) Hemavathy outflow, and if this works out to as a negative value, the net inflow into KRS should be taken as zero. Then, the total of net inflow of 4 reservoirs would be the sum of inflows of the 3 reservoirs, viz., Harangi, Hemavathy and Kabini, plus the net inflow of KRS. This procedure has to be adopted so as to avoid the negative values in KRS inflow.*"

The Member from Karnataka submitted that the negative values of net inflows are not new things and such negative values are being obtained in several other systems like Tungbhadra. He submitted that adoption of zero for negative values would be against the principles of water balance. On an enquiry about the man made abstractions in the intervening reaches of the river between the KRS-Hemavathy and KRS-Harangi during the period when negative inflows are obtained for KRS reservoir, the Member from Karnataka informed that there are only natural abstractions like evaporation and recharge to the ground water and

there are no man made abstractions. The representative from Kerala stated that both values should be reported.

The discussion remained inclusive and therefore postponed for discussion in the subsequent meeting of the Committee.

(Action: Member Secretary, CWRC)

2.3.4 Mailing list:

It was informed by Karnataka representatives that the minutes of the first meeting of CWRC have been received by them only a day before this meeting. The Member Secretary informed that his office has mailed it to all Members, and also at the other email addresses available with his office.

In order to avoid any delay in communication in future, it was decided that each Member would inform email addresses as well as mobile and landline numbers to the Member Secretary, which would then be included in the mailing list for Minutes, as well as all other communications.

(Action: All Members, Member - Secretary CWRC)

The next date of meeting was fixed as 9th August, 2018 at 1100 Hrs. at New Delhi.

The meeting ended with a vote of thanks to the Chair.

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Annex - I

2nd MEETING OF

THE CAUVERY WATER REGULATIONCOMMITTEE

HELD ON 19.7.2018

LIST OF PARTICIPANTS

1.	ShriNavin Kumar, Chief Engineer, IMO,CWC& Chairman, CWRC
2.	ShriM. Bangaraswamy, Chief Engineer (ISW), WRD., Govt of Karnataka
3.	Shri K.A. Joshy, Chief Engineer, ISW, Govt. of Kerala
4.	Shri V. Shanmugasundaram, Chief Engineer, PWD, Govt. of Puducherry
5.	Shri. R. Senthil Kumar, Chief Engineer, WRD, Govt. of Tamil Nadu
6.	Dr.M.Mohapatra, Scientist G (Services), IMD, New Delhi.
7.	Shri N.M.Krishnanunni, Chief Engineer., C&SRO, CWC, Coimbatore
8.	Dr.B.N.Shrinivas Murthy, Commissioner (Horticulture), Ministry of Agriculture Cooperation and Farmers Welfare, New Delhi.
9.	Shri A.S.Goel, Chief Engineer, CWC, & Member Secretary, CWRC.

****

Annex – II

ದೂರವಾಣಿ : 080-22352997 / 22354900
ಫ್ಯಾಕ್ಸ್ : 080-22352998
ಕಾವೇರಿ ನೀರಾವರಿ
ನಿಗಮ ನಿಯಮಿತ
(ಕರ್ನಾಟಕ ಸರ್ಕಾರದ ಉದ್ಯಮ)
ಪ್ರಧಾನ ಕಛೇರಿ : 3 ನೇ ಮತ್ತು 4ನೇ ಮಹಡಿ,
ಮೇಲ್ಮೈ ಜಲಮಾಹಿತಿ ಕೇಂದ್ರ, ಕಟ್ಟಡ,
ಆನಂದರಾವ್ ವೃತ್ತ, ಬೆಂಗಳೂರು-೯.

CIN-U45305KA2003SGC032944

Tel. : 080-22352997 / 22354900
Fax : 080-22352998
CAUVERY NEERAVARI
NIGAMA LIMITED
(A Govt. of Karnataka Enterprise)
Corporate Office : 3rd & 4th Floor,
Surface Water Data Centre Building
Anandrao Circle, Bengaluru-560 009.

No. CNNL/TECH-4/CWDT-879/2018-19 Date: 17/07/2018

To:

The Chairman,
Cauvery Water Regulation Committee,
Kalindi Bhavwan, B-5,
Tara Crescent Road,
Qutub Institutional Area,
New Delhi-110016.

Sir,

Sub: Second Meeting of CWRC scheduled on 19th July 2018 at New Delhi – Reg.

Ref: Letter of Member Secretary, CWRC No.12/09/2018-CWRCS/9-16 dated 9th July, 2018.

==

It is informed that the Second Meeting of CWRC is scheduled on 19th July 2018 at New Delhi along with the Agenda, in the letter cited under reference above.

The Reply to the Agenda items is enclosed herewith for kind information and it is requested to take the same on record.

Yours faithfully,

Member of the Committee (CWRC)
Karnataka and
Managing Director, CNNL, Bengaluru

Regd. Office : Cauvery Bhavan Complex, 4th Stage, Gokulam, Manjunathapura, MYSURU-570 020.
Tel. : 0821-2412101 Tele-fax : 0821-2414191 E-mail : cnnlmd@yahoo.com

REPLY OF KARNATAKA TO THE AGENDA OF SECOND MEETING OF CWRC SCHEDULED ON 19TH JULY 2018 AT NEW DELHI.

AGENDA ITEM – 1: To review status of Hydro-meteorological situation in the Cauvery Basin, especially in respect of the eight reservoirs.

The inflow, outflow, withdrawal, storage and flow at Biligundlu as on 18.07.2018 for Harangi, Hemavathy, Krishnarajasagara and Kabini reservoirs is enclosed.

AGENDA ITEM – 2: To finalize the formats circulated in the 1st meeting of the Committee held on 5th July, 2018.

The State of Karnataka has no objection to – (i) Proforma for maintaining the data of inflow and outflow of the reservoirs in the Cauvery basin; (ii) Proforma for Water Requirement (Sheet No.1) and (iii) Proforma for Water Requirement – Domestic / Industrial Demand (Sheet No.3).

However, the State of Karnataka would appeal to the CWRC against the adoption of Proforma for Water Requirement – Irrigation Demand (Sheet No.2). The Proforma Sheet No.2 is neither legal nor justified. Though, the expression "indent" is not used in Sheet No.2, but the nature of information sought for is nothing but an indent. The question is that whether it is permissible for the CWRC to seek the indent or water demands on a 10 daily basis as has been proposed in Sheet No.2. Firstly, this is not legally permissible, because paragraph 10(3)(vii) of the Notification dated 01.06.2018 does not require submission of indent or water demands beyond the month of June, because as it has been specifically mentioned that indent is only at the "beginning of the season"

beginning from 1st June of every water year. This requirement stands fulfilled by Proforma Sheet No.1. However, the indent mentioned in paragraph 10(3)(i) is not clear. However, if it is read contextually with paragraph 10(3)(vii) and paragraph 10(3)(viii), it becomes clear that it can operate only during the distress year ("deficiency") that too in June at the beginning of the season. The conjoint reading and application of purposive interpretation stands to reason, because the purpose of the machinery under Sec.6A framed by the Central Government vide Notification dated 01.06.2018 is only to implement the judgment of the Hon'ble Supreme Court modifying the Decision. This implementation boils down to the question whether the State of Karnataka has ensured 177.25 tmc in a normal year at the inter-State border Biligundlu on a monthly schedule split into 10 daily schedule. This obligation in the normal year can be accomplished by the Cauvery Water Management Authority (CWMA) and Cauvery Water Regulation Committee (CWRC) , by relying on the flows measured by the Central Water Commission at the inter-State border Biligundlu. Therefore, for these reasons, the State of Karnataka would appeal to the CWRC against the adoption of Proforma in Sheet No.2 in normal years.

The State of Karnataka reserves its right to challenge the constitutional validity of the Notification dated 01.06.2018 issued by the Central Government under Sec.6A of the Inter-State River Water Disputes Act, 1956. The above submissions and participation of Karnataka is without prejudice to its right to take appropriate legal steps.

Member of the Committee (CWRC)
Karnataka and
Managing Director, CNNL, Bengaluru

Annexure

RESERVOIR AND CROP AREA INFORMATION - 1st JUNE to 18th July 2018

Sl. No.	Dam/Project	Inflow	Outflow	Withdrawal (tmc)					Live Storage	
				Irrigation	Domestic		Industries		Beginning of July 2018	18th July 2018
					Withdrawals	Consumptive use	Withdrawals	Consumptive use		
1	Hemavathy	43.899	9.38	4.488	0.640	0.128	0.038		23.11	33.428
2	Harangi	19.908	12.606	0.473					5.052	7.197
3	Kabini	67.435	54.481	0.874	2.650	0.53			14.61	14.282
4	Krishnarajasagara	45.538	23.461	6.491					26.549	41.337
	TOTAL	176.780	77.942	12.326	3.290	0.658	0.038	negligible		

NOTE: 1) The outflows from Hemavathy and Harangi are deducted from Inflow into Krishnarajasagara.

2) The outflows from Hemavathy and Harangi are not considered since, the outflows is accounted for in the inflows into Krishnarajasagara.

Member, CWRC
and Managing Director
C.N.N.L., Bengaluru

Annex-III

GOVERNMENT OF TAMIL NADU
WATER RESOURCES DEPARTMENT

From

Er. R. Senthilkumar, M.E., M.I.E.,
Member, CWRC and
Chief Engineer, WRD.,
Tiruchy Region, Tirucy-620 020.
Phone No: 0431-2332287
Fax No: 0431-2331148
E.mail-ID: cetrydb@hotmail.com

To

The Member Secretary,
Cauvery Water Regulatory Committee,
O/o The Chief Engineer,
Yamuna Basin Organisation, CWC,
Kalindi Bhavan,
B-5, Tara Crescent Road,
Qutub Institutional Area,
New Delhi-110 016

Letter No: 186[M] / OT-II / F-CWRC / date: 16.07.2018

Sir,

Sub: Minutes of First Meeting of Cauvery Water Regulatory Committee (CWRC) held on 5th July, 2018 at New Delhi – Furnishing remarks of Tamil Nadu - Reg.

Ref: The Member Secretary, CWRC, Letter No. 12/09/2018-CWRCS dated 06.07.2018.

******

I herewith enclose the remarks of Tamil Nadu on the minutes of the 1st meeting of CWRC held on 5th July, 2019 at New Delhi.

Encl: As above.

16.7

Member, CWRC and
Chief Engineer, WRD,
Tiruchy Region, Tiruchy-20.

Copy presented to Sh. Navin Kumar, Chief Engineer, IMO, CWC/Chairman, CWRC, New Delhi.

Copy presented to Principal Secretary, PWD, Secretariat, Chennai – 9.

Copy to the Chairman, Cauvery Technical Cell cum Inter State Waters Wing, Egmore, Chennai – 8.

Remarks of Tamil Nadu on the minutes of the 1st meeting of CWRC held on 5th July, 2019 at New Delhi

1.1. Hydro-meteorological situation in Cauvery basin:

This rainfall data on 10 daily basis for each sub-basins as mentioned in the minutes have to be provided for both monsoons i.e., South-West monsoon, and North-East monsoon, regularly to the Member States by e-mail.

1.2. Arrangements for collection and compilation of data regarding actual yield in the basin:

- It is stated that to assesses yield at any point in the basin, data on abstractions, for the current year as well as for previous years are to be provided by the party States. For this data are proposed to be collected by CWRC under four catagaries.
- In this regard, under the first category, "the withdrawal for abstractions from all the major reservoirs" should include withdrawal + change in storage + evaporation losses for calculating abstractions from the major reservoirs.
- The yield calculation has to be done at KRS, Kabini, Billigundulu & Lower Coleroon anicut only.
- Last ten good / normal years meteorologically may be considered for calculating the yield of previous years.

1.3 Procedure for compilation and reconciliation of monthly water account for each reservoir:

With regard to evaporation loss from the Mettur, Bhavani and Amaravathi reservoirs in Tamil Nadu, a status report on the equipments available and the procedure presently adopted is furnished in the Annexure.

1.4 Any other item with the permission of the Chair:

i) Proforma for maintaining data of inflow and outflow of the reservoirs in the Cauvery basin (Annexure VI).

The format proposed is similar to the one that is being adopted now. The proposed format is acceptable.

Comments with reference to the data to be furnished in the proposed format are as follows:

- Now we are getting the data of KRS, Harangi and Hemavathy and Kabini, daily, from Karnataka and Tamil Nadu furnishes the data of Mettur under exchange of data. This has to be continued.
- At present the net inflow in the four major reservoirs of Karnataka is being worked out by Karnataka as, total inflow of four major reservoirs minus river outflow of Harangi and Hemvathy. The outflow of Harangi and Hemavathy reservoirs flows to KRS only. Hence, the correct procedure would be, to calculate the net inflow into KRS separately, i.e., KRS inflow (–) Harangi outflow (–) Hemavathi outflow, and if this works out as a negative value, the net inflow into KRS should be taken as zero. Then, the total of net inflow of 4 major reservoirs would be, the sum of inflows of the 3 reservoirs, viz., Harangi, Hemavathi and Kabini, plus the net inflow of KRS. This procedure has to be adopted so as to avoid the negative values in KRS inflow.

ii) Proforma for water requirement (Annexure VII)

- One time data covering the water requirement for the Major Project, Medium project, Minor project, Domestic and Industrial will be furnished as per the Final Order of the Tribunal. For the designated 8 Reservoirs only, 10 daily requirement will be furnished.

iii) **Proforma for Irrigation water requirement (Annexure VIII)**

- The data on water requirement for the designated 8 reservoirs alone will be furnished to the Committee.
- Clarification is needed, whether to furnish one time data considering a year to be normal and then to give the 10 days need depending on the situation.

(iv) **Proforma for domestic / industrial water requirement (Annexure IX)**

- No remarks

Member, CWRC and
Chief Engineer, WRD,
Tiruchy Region, Tiruchy-20.

Annexure

Status of assessment of evaporation losses in Mettur, LBP (Lower Bhavani Project) and Amaravathy Reservoirs

A. Mettur Reservoir

For calculating the reservoir evaporation losses during the construction of Mettur dam, the land evaporation was observed at then existed Mettur observatory from 1928-1934. From that, the average monthly land evaporation was arrived at, vide, "History of Cauvery Mettur Project", published by Central Board of Irrigation and Power in January, 1987 @ pages 177, 178 & 180 (Publication No. 185). The annual land evaporation was 110.99 inches. The evaporation in the reservoir was assumed to be 67% of the evaporation recorded at the land station. Thus, the total evaporation in a year works out to (110.99 inches x 0.67=) 74.36 inches. Based on that, a table giving evaporation losses in a day for every month was developed for different storages in the reservoir, which is adopted at present. A copy of the land evaporation data and the Table showing evaporation losses versus reservoir capacity, are annexed as **Appendix – 1**.

As of now, there is no pan evaporimeter at the Mettur dam site. However, a Full Climatic Station (FCS) is maintained by the State Ground & Surface Water Resources Data Centre (SG&SWRDC), WRD at Chithode, which is at about 40 km from the dam site. The evaporation data of that station may be considered and validated by IMD for adopting to estimate evaporation losses for Mettur Reservoir, more precisely.

B. LBP (Lower Bhavani Project) Reservoir

A standard table for calculating evaporation losses was developed when the Lower Bhavani Project was constructed, which gives the monthwise evaporation losses in depth i.e., in inches. A copy of the table is enclosed as **Appendix – 2**. The annual evaporation is 75.14 inches. This is

comparable to the evaporation losses from the tanks in South India as per Ellis, vide, Ellis Manual, 1963, Page – 55.

From the monthly evaporation values, daily evaporation is worked out. The daily evaporation values thus obtained is multiplied by the area of water spread corresponding to the storage level of that day at 8.00 am, to estimate the daily evaporation losses in the Bhavani Reservoir.

A Full Climatic Station maintained by SG&SWRDC, WRD, at Bhavanisagar may be used for calculating evaporation losses from LBP Reservoir, after getting the data duly validated by IMD.

C. Amaravathy Reservoir

The evaporation losses of Amaravathy Reservoir are worked out in the same manner as that of Bhavani Reservoir. A copy of monthly evaporation loss table pertaining to Amaravathy Reservoir is annexed as **Appendix – 3**. The total annual evaporation is 75.11 inches. This is also comparable to the evaporation losses from the tanks in South India as per Ellis, vide, Ellis Manual, 1963, Page – 55.

In the absence of pan evaporimeter at the Amaravathy dam site, the pan evaporation data collected from Uthamapalayam FCS maintained by SG&SWRDC, WRD, which is located at about 90 km in the downstream side may be considered for estimating daily evaporation losses for Amaravathy Reservoir, after the data are validated by IMD. If any other appropriate weather station with evaporation data is found nearby, it could be adopted after validating the same.

Member, CWRC and
Chief Engineer, WRD,
Tiruchy Region, Tiruchy-20.

Appendix - 1

Mettur Reservoir

Evaporation Losses per day

Fig. in MCFt.

Reservoir Capacity in MCFt.	Jan	Feb, Jun & Jul	Mar & Apr	May	Aug & Sep	Oct, Nov & Dec
8000	6	7	10			
10000		8	11	10	8	6
11000				11		
11500	7					
12000		9				
13000			12	12	9	
13500				13		
14000		10				
14500	8					7
15000			13			
16000		11			10	
17000			14	14		
18500			15			8
19000	9					
20000		12	16	15	11	
22000		13				
22500	10			16	12	
23000			17			9
25000			18	17		
25500		14				
26000					13	
26500	11					
27000						10
28000			19	18		
30000	12	15			14	11
31000			20	19		
31500		16				
33500					15	
34000			21	20		
34500	13					
35000		17				
36000						12
37000			22		16	
38000				21		
40000	14	18	23			13
41000				22	17	
42500		19				
43000			24			

Reservoir Capacity in MCFt.	Jan	Feb, Jun & Jul	Mar & Apr	May	Aug & Sep	Oct, Nov & Dec
44000	15					
45000				23		
45500					18	
46000		20	25			
47000						14
48000				24		
50000	16	21	26		19	
51000				25		
53000			27			
53500						15
54000	17	22			20	
56000				26		
56500			28			
60000	18	23	29	27	21	16
63500		24				
64000			30	28		
65500					22	
67500	19		31			17
68500		25				
69000				29		
70000					23	
71000			32			
73000				30		
74000		26				
75000	20		33		24	18
76000				31		
80000	21	27	34			
81000				32		
81500					25	
84000			35			19
86000		28		33		
89000			36			
90000	22	29			26	20
93000			37			
95000	23				27	
98000		30	38			
100000	24	31			28	21

16.7

Member, CWRC and
Chief Engineer, WRD,
Tiruchy Region, Tiruchy-20.

Appendix - 2

Lower Bhavani Project (Bhavanisagar)

Ellis Evaporation Loss

For The Month

MONTH	EVAPORATION LOSS
January	7.32 inch
February	7.61 inch
March	12.59 inch
April	8.68 inch
May	6.60 inch
June	7.55 inch
July	7.04 inch
August	5.28 inch
September	3.26 inch
October	1.82 inch
November	2.79 inch
December	4.60 inch
Total	**75.14 inch**

Member, CWRC and
Chief Engineer, WRD,
Tiruchy Region, Tiruchy-20.

Appendix - 3

Amaravathy Reservoir

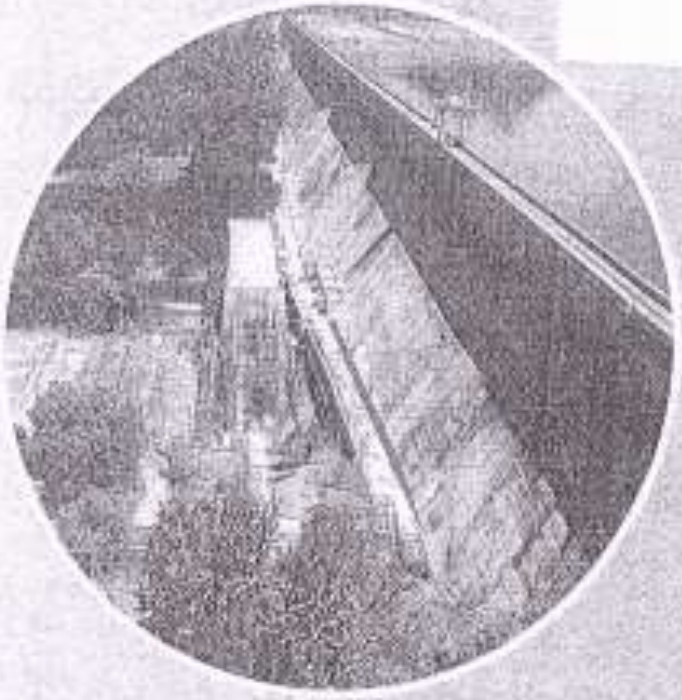
Ellis Evaporation Loss

For The Month

MONTH	EVAPORATION LOSS
January	7.32 inch
February	7.61 inch
March	12.59 inch
April	8.68 inch
May	6.60 inch
June	7.55 inch
July	7.04 inch
August	5.25 inch
September	3.26 inch
October	1.82 inch
November	2.79 inch
December	4.60 inch
Total	**75.11 inch**

Member, CWRC and
Chief Engineer, WRD,
Tiruchy Region, Tiruchy-20.

(REVISED EDITION)



CENTRAL BOARD OF IRRIGATION AND POWER

New Delhi

January 1987

January 1929 until May 1934 when the observations were discontinued.

Early in 1930 the observatory was shifted from the old site near the Test House, which had by then been dismantled, to a new open site near the obelisk at the right flank of the dam. The old site being rather near the rear of the dam was liable to be affected by that great mass of masonry which cut off the breeze during the north-east monsoon and radiated a very appreciable amount of heat by reflection of the sun's rays at all times. The new station, being situated at a level slightly above the top of the dam and at the flank would be likely to give more accurate readings of the mean temperatures at Mettur after the completion of the construction and the filling of the reservoir.

It was to be expected that the creation of a reservoir covering an area up to nearly 60 square miles would have some considerable influence on the climate of Mettur and the amount of humidity in the air. Since, however, the prevailing wind is up the valley from the south for the greater part of the year the presence of a large expanse of water to the north of the town has actually no appreciable influence on the temperature.

Since the dam was completed in 1934 there had been two very weak south-west monsoons and the rainfall in 1934 and 1935 was far below normal. It is, therefore, too early to note whether the presence of the reservoir has any effect on the local rainfall.

The following tables show the monthly rainfall recorded at Mettur from January 1927 to December 1935, the number of rainy days at Mettur in each month, and the monthly evaporation recorded.

A table is also given showing the net effect on the reservoir level due to rainfall and evaporation. The quantity of water in the reservoir gained or lost by direct rainfall or evaporation of course depends upon the waterspread which is continually varying and this has to be worked out daily from tables prepared for the purpose, the waterspread at all levels being known. We see from the table that the average evaporation in March for the six years, 1929–1934, amounts to over 22½ inches, as recorded at the land evaporation station. The actual evaporation in the reservoir is assumed to be 67 per cent of that recorded at the land station. Owing to the violent disturbances due to high winds and storms it was not found practicable to maintain a floating evaporation station in the reservoir itself.

The average maximum and minimum temperatures recorded at Mettur are interesting and show the unusually high variations between the day and night temperatures, being about 30° almost throughout the year. A really hot night there is almost unknown, and, despite the high average day temperature even during the winter months, the compensation of cool nights makes Mettur a

STATEMENT No. II.

Number of rainy days in the month at Mettur.

Note.—Days on which there was only slight drizzle [illegible] have also been included under rainy days.

	1927.	1928.	1929.	1930.	1931.	1932.	1933.	1934.	1935.	Average.
January ..	No record.	1	4	2	1	Nil.	Nil.	4	2	1·9
February.	Do.	6	5	6	Nil.	6	Nil.	Nil.	Nil.	3·9
March ..	Do.	4	8	2	1	Nil.	3	Nil.	Nil.	2·6
April ..	4	11	16	5	8	11	8	5	8	8·7
May ..	11	21	14	10	13	10	16	11	8	11·8
June ..	20	14	23	23	17	15	23	7	10	16·3
July ..	5	20	25	20	22	12	18	4	2	16·4
August ..	11	17	17	14	25	26	18	8	14	15·3
September.	16	8	17	11	14	15	13	2	5	11·2
October.	7	23	13	20	17	20	14	10	6	15·6
November.	9	16	11	14	17	13	11	4	6	11·2
December.	8	10	10	6	16	5	5	1	4	6·8
For the year.	78 from April only.	165	167	122	165	133	135	71	78	132·0

STATEMENT No. III.

(Land) evaporation (inches).

Observed at the Mettur Observatory.

	1928.	1929.	1930.	1931.	1932.	1933.	1934.	Average.
January.	No record.	7·701	7·757	[illegible]	[illegible]	[illegible]	6·780	[illegible]
February.	Do.	[illegible]	7·471	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
March ..	Do.	[illegible]	11·170	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
April ..	Do.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
May ..	Do.	[illegible]	[illegible]	[illegible]	[illegible]	11·181	[illegible]	[illegible]
June ..	[illegible]	[illegible]	[illegible]	11·140	[illegible]	[illegible]	Discontinued from June 1934.	[illegible]
July ..	[illegible]	[illegible]	11·152	[illegible]	[illegible]	[illegible]		[illegible]
August ..	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]
September.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	7·477		[illegible]
October.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]
November.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	7·312		[illegible]
December.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]
Total per year.	[illegible] for 7 months only.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	...	[illegible]
Maximum per day during the year.	[illegible]	[illegible]	[illegible]	0·400	[illegible]	0·447	..	[illegible]
Date of maximum evaporation.	24th June.	2nd April.	18th August.	[illegible] May.	13th April.	29th April.	..	..

IDRB/ISW/AD2/758/2018

Office of the Chief Engineer
ISW,Vikas Bhavan
Thiruvananthapuram
Date 18/07/2018

From
JOSHY.K.A
Chief Engineer
ISW, Government of Kerala

To
The Member Secretary
Cauvery Water Regulation Committee
Office of the Chief Engineer, Yamuna Basin Organisation
CWC.

Sir ,

Sub:- First meeting of Cauvery Water Regulation Committee (CWRC) held on 05/07/2018 – remarks & details furnishing-reg
Ref:- Letter No. 12/09/2018– CWRCS/1-8 dated 06/07/2018 from the Member Secretary, CWRC

Kind attention is invited to the references cited. The details requested vide the agenda items of the minutes of the meeting and also the remarks on the above are submitted here with for favour of information and necessary action.

Agenda 1.1 Hydro- meteorological situation in Cauvery basin.

A consolidated table indicating the storage , inflow, outflow and with drawl of Banasurasagar reservoir for the month of June 2018 is enclosed herewith as Annexure – 1.

Agenda 1.3 Procedure for compilation and reconciliation of monthly water accounts for each reservoirs.

It may be noted that no evaporimeters are used to measure the evaporation from the Banasurasagar reservoir at present . However , it is recommended that same standard equipments should be installed in all Basins of Cauvery. It is recommended to install Pan evaporimeter in reservoirs and the evaporimeter readings should be correlated to the evaporation of the reservoir by a correction factor suggested by IMD.

Agenda 1.4 Any other item permitted by the chair

The format for maintaining data of storage, inflow , outflow and withdrawl of the reservoirs circulated during the meeting is modified and is annexed as Annexure II

JOSHY K.A
CHIEF ENGINEER (ISW)
GOVERNMENT OF KERALA

Annex-I

Storage, Inflow, outflow and withdrawel of 8 reservoirs in Cauvery Basin for the month of June 2018 (All figures in TMC*)

Sl no	Reservoir	Inflow	Out flow	Withdrawel				Live storage	
				Irrigation	Domestic	Industries	Total	Biginning of month	End of month
1	BANASURASAGAR	1.284	0	0	0	0	0	0.171	3.456

* 1TMC = 28.316Mm^3

Evaporation losses not accounted

JOSHY. K. A
CHIEF ENGINEER ISW

ANNEXURE - II

Proforma for maintaining data of inflow and out flow of the reservoir in the Cauvery basin

1. Eevation -Capacity curve of each reservoir
2. Elevation -Area curve of each reservoir
3. Name of reservoir

				Initial storage			Releases								Final storage						
S.No.	Date	time	Initial water level	Gross (TMC)	Live (TMC)	Dead (TMC)	Spill (TMC)	Power house (TMC)	River sluice (TMC)	Total (TMC)	Canal releases (TMC)	others (TMC)	Evapouration (TMC)	Total abstraction including evaporation lossess (TMC)	Gross (TMC)	Live (TMC)	Final water level	Change in gross storage (TMC)	Gross inflow (TMC)	Import from other basin (TMC)	Net inflow (TMC)
1	2	3	4	5	6	7	8	9	10	11=8+9+10	12	13	14	15=12+13+14	16	17	18	19=16-5	20=19-(11+15)	21	22=20-21
1		8:00:00																			
2	01.06.2018																				
3		8:00:00																			
	02.06.2018																				

Clarification on how spill is measured

JOSHY. K. A
CHIEF ENGINEER (ISW)

Annex-V

OPENING REMARKS BY TAMIL NADU

2nd Meeting of Cauvery Water Regulation Committee on 19th July 2018 at New Delhi.

Respected Chairman, Respected Member Secretary, Members of Cauvery Water Regulation Committee, officers of Government of India from the state of Karnataka, Kerala and Puducherry.

Since, the last Meeting of Cauvery Water Regulation Committee held on 5th July, the performance of South West Monsoon rainfall is more than the normal till now in the States of Karnataka and Kerala and heavy rainfall has been realised in the catchment of the Cauvery Basin.

Due to the release of inevitable surplus water from the Karnataka reservoirs, the realisation of flows at Billigundulu have also been copious and the storage in Mettur dam has increased consequently. It has been proposed to open the water from Mettur dam for irrigation on 19.07.2018.

I hope the present trend of South West Monsoon will continue.

I request the Chairman of the Committee to monitor the realisation of flows at Billigundulu in the subsequent months broken in three spells and ensure that the specified quantum of water month wise as mentioned in the judgement is realized at Billigundulu, in the ensuing months in this irrigation year.

I also request the Chairman of the Cauvery Water Regulation Committee to organise the next meeting at Bengaluru before this month end.

I will give the views on the agenda items as and when they are taken up.

I thank the Chairman, Member Secretary and all other members for giving me an opportunity to express my views on behalf of Government of Tamil Nadu.

Annex-VI

HYDRO METEOROLOGICAL CONDITION IN THE BASIN AS ON 18.7.2018

(SOURCE: CWC)

No.16/8/2018/33 — 18.07.2018

SL NO	NAME OF THE RESERVOIR	DATE OF OBSERVATION	RESERVOIR LEVEL IN ft	ACTIVE STORAGE	LIVE STORAGE	INFLOW	Cumulative inflow till date for the month	OUTFLOW	Cumulative Outflow till date for the month	WITHDRAWAL	Cumulative withdrawal till date for the month
1	KARNATAKA										
(i)	**HARANGI**	**18.07.2018**	**2856.41**	**6.874**	**7.197**	**1.4060**	**15.1310**	**1.2690**	**12.5320**	**0.0390**	**0.4700**
(ii)	**HEMAVATHI**	**18.07.2018**	**2919.57**	**30.399**	**33.428**	**2.3670**	**23.6370**	**2.1600**	**7.4230**	**0.2640**	**4.0680**
(iii)	**KABINI**	**18.07.2018**	**2281.82**	**8.321**	**14.282**	**3.4260**	**39.6670**	**3.4560**	**38.8060**	**0.0690**	**0.8660**
#(iv)	**K.R.SAGARA**	**18.07.2018**	**122.08**	**37.360**	**41.337**	**6.1650**	**43.6870**	**6.3500**	**22.6410**	**0.2260**	**4.2810**
2	TAMIL NADU										
##(i)	**METTUR**	**18.07.2018**	**102.68**	**53.552**	**68.359**	**9.0233**	**47.6337**	**0.0864**	**1.5479**	**0.0000**	**0.0000**
(ii)	**AMARAVATHY**	**18.07.2018**	**1171.39**	**3.538**	**3.723**	**0.3581**	**3.1217**	**0.3173**	**0.5706**	**0.0214**	**0.0214**

INFLOW DATA FOR CAUVERY AT BILIGUNDULU SITE OF CWC

(IN THOUSAND MILLION CUBIC FEET - TMC)

Annex- VII

CAUVERY BASIN RAINFALL VALUES (in mm) FOR JULY (1-10th)-2018.

(As provided by IMD)

CAUVERY BASIN RAINFALL VALUES (in mm) FOR JULY(1-10th)-2018.

Month	JULY(1-10th) -2018.		
Watershed	Actual	Normal	% Dep.
Biligundulu Except KR Sagar_Kabini	24.9	18.0	38%
KR_Sagar	145.0	155.6	-7%
Kabini	273.1	285.5	-4%
Cauvery Except Biligundulu	36.3	20.0	82%
Biligundulu	90.0	95.2	-5%
Cauvery	53.1	50.8	5%

Annex-VIII

PROFORMA FOR MAINTAINING DATA OF INFLOW AND OUTFLOW OF THE RESERVOIRS IN CAUVERY BASIN

Proforma for maintaining data of inflow and outflow of the reservoirs in the Cauvery Basin

1	Name of reservoir																			
2	Elevation-Area curve of reservoir																			
3	Elevation-Capacity curve of reservoir																			
4	Dead Storage Level					Dead Storage Capacity							Year							
													Month							
S.No.	Date	Time	Initial water level	Intial Storage		Releases				Canal releases (TMC)	Others (TMC)	Evaporation (TMC)	Total abstraction including evaporation lossess (TMC)	Final Storage		Final water level	Change in storage (TMC)	Gross Inflow (TMC)	Import from other basin (TMC)	Net Inflow (TMC)
				Gross (TMC)	Live (TMC)	Spill (TMC)	Power house (TMC)	River sluice (TMC)	Total (TMC)					Gross (TMC)	Live (TMC)					
1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10=7+8+9*	*11*	*12*	*13*	*14=11+12+13*	*15*	*16*	*17*	*18=16-6*	*19=18-(10+14)*	*20*	*21=19-20*
1	01.06.2018	8:00:00																		
2	02.06.2018	8:00:00																		
3	...																			
...	...																			

Annex-IX

Proforma for Water Requirement

Sheet 1

Name of State: **Year:**

Sl. No.	Name of Project/Scheme	Crop-wise Details									Evaporation Losses (TMC)	Total water requirement (TMC) i.e. sum of col. 5, 8, 11 & so on + col. 12
		Crop 1			Crop 2			Crop 3 & so on				
		Area (acre)	Delta (feet)	Water Requirement (TMC)	Area (acre)	Delta (feet)	Water Requirement (TMC)	Area (acre)	Delta (feet)	Water Requirement (TMC)		
1	2	3	4	5	6	7	8	9	10	11	12	13
A. Major Projects/Schemes												
1												
2												
.												
.												
.												
B. Medium Projects/Schemes												
1												
2												
.												
.												
.												
C. Minor Projects/Schemes												
1												
2												
.												
.												
.												
D. Domestic Demand		-	-	-	-	-	-	-	-	-		
E. Industrial Demand		-	-	-	-	-	-	-	-	-		
Grand Total of Water Requirement in TMC (A + B + C + D + E)												

Annex-X

Proforma for Water Requirement
Sheet 2 - Irrigation Demand

Name of Project/Scheme: *Scheme 1*

Sl. No.	Crop-wise Details	June	July	Aug	Sept	Oct	& so on	Total
1	2	3	4	5	6	7	8	9
1	Crop 1							Sum = col. 5 of Sheet 1
2	Crop 2							Sum = col. 8 of Sheet 1
3	Crop 3 & so on							Sum = col. 11 of Sheet 1
4								
5								
	Sub - Total 1(TMC)							

Name of Project/Scheme: *Scheme 2*

Sl. No.	Crop-wise Details	June	July	Aug	Sept	Oct	& so on	Total
1	2	3	4	5	6	7	8	9
1	Crop 1							Sum = col. 5 of Sheet 1
2	Crop 2							Sum = col. 8 of Sheet 1
3	Crop 3 & so on							Sum = col. 11 of Sheet 1
4								
5								
	Sub - Total 2(TMC)							

Name of Project/Scheme: *Scheme 3 & so on*

Sl. No.	Crop-wise Details	June	July	Aug	Sept	Oct	& so on	Total
1	2	3	4	5	6	7	8	9
1	Crop 1							Sum = col. 5 of Sheet 1
2	Crop 2							Sum = col. 8 of Sheet 1
3	Crop 3 & so on							Sum = col. 11 of Sheet 1
4								
	Sub - Total 3(TMC)							
	Grand Total (TMC) i.e. sum of Sub-Totals 1, 2 , 3 & so on							

Annex-XI

Proforma for Water Requirement

Sheet 3 - Domestic / Industrial Demand

Sl. No.	Domestic / Industrial Details	June	July	Aug	Sept	Oct	& so on	Total
1	2	3	4	5	6	7	8	9
1								Sum = col. 13 of Sheet 1
2								
3								
4								
5								
Total (TMC)								

Note: **Separate sheets should be made for both domestic as well as for industrial demands.**