**GOVERNMENT 0F INDIA**

KRISHNA WATER DISPUTES TRlBUNAL

# THE REPORT

# OF

# THE KRISHNA WATER DISPUTES TRIBUNAL

# WITH THE DECISION

VOLUME III

**NEW DELHI**
**1973**

GOVERNMENT OF INDIA

KRISHNA WATER DISPUTES TRIBUNAL

# THE REPORT

OF

# THE KRISHNA WATER DISPUTES TRIBUNAL

# WITH THE DECISION

**IN THE MATTER OF WATER DISPUTES REGARDING THE INTER-STATE RIVER KRISHNA AND THE RIVER VALLEY THEREOF**

**BETWEEN**

1. THE STATE OF MAHARASHTRA.
2. THE STATE OF KARNATAKA.
3. THE STATE OF ANDHRA PRADESH.
4. THE STATE OF MADHYA PRADESH
5. THE STATE OF ORISSA.

Parties to the dispute until 19th April, 1971.

## VOLUME III

**NEW DELHI**
**1973**

3 I&P/73—1.

## CON-TENTS
## A P PEN D I C E S

*Pages*

## APPENDIX A
## CONVERSION TABLE

Derived from tables given in Indian Standard conversion factors and conversion tables IS ; 786-1967 (pp. 29, 44, 45, 52, 54, 56 & 57) All figures are corrected to four places of decimal.

### 1. *Linear*

1 inch = 25.40 millimetres

1 foot = 12 inches
= 304.80 millimetres

1 mile = 5,280 feet
= 1.609.344 metres
= 1.6093 Kilometres.

100 millimetres = 3.9370 inches

1 metre = 3.2808 feet
= 1.0936 yards

1 kilometre = 0.6214 mile

### 2. *Area*

1 acre = 4840 square yards
= 0.4047 hectare

1 square mile = 640 acres
= 258.999 hectares

1 hectare 100 hectares = 2.4711 acres
= 247.105 acres
= 0.3861 square mile

### 3. *Volume*

1 cubic foot — 0.0283 cubic metre
= 6.2288 gallons

1 million cubic feet = 11.5741 cusec-days
= 22.9568 acre-feet
= 28316.8 cubic metres
= 6.2288 million gallons

One thousand million cubic feet = 28.3 168 million cubic metres
= 22956.84 acre-feet
= 6228.8 million gallons

1 million acre-feet = 43.5600 T.M.C.
= 1.2335 milliard cubic metres

1 cusec-day = 0.0864 million cubic feet
= 1.9835 acre-feet
= 2446.5715 cubic metres
= 0.5382 million gallons

1 Gallon = 4.5461 litres

1 million gallons = 160,544 cubic feet
= 4,546.09 cubic metres

1 cubic metre = 35.3147 cubic feet
= 219.969 gallons
= 1000 litres

1 million cubic metres = 35.3147 million cubic feet
= 810.71 acre-feet

1 milliard cubic metres = 0.8107 M.A.F.

1 cubic metre per second for 1 day = 0.0864 million cubic metre
= 70.0453 acre-feet
= 3.0512 M. Cft.

### 4. *Rates of Flow*

1 cubic feet per second = 1.9835 acre feet per day
= 0.028317 cubic metre per second
= 28.3168 litres per second
= 6.2288 gallons per second
= 22,423.68 gallons per hour
= 0.5382 million gallons per day

1 million gallons per day = 1.8581 cusecs
= 0.0526 cubic metres per second

1 cubic metre per second = 35.3147 cusecs
= 219.969 gallons per second

1 milliard cubic metre per day = 0.4087 million cusecs
= 0.8107 million acre-feet per day

1 litre per second = 0.03531 cusecs
= 791.8892 gallons per hour

Milliard = 1,000 million
= 1,000,000,000

| Sd/- | Sd/- | Sd/- |
|---|---|---|
| E.G. Saldahna | S.G. Balekundry | M. Sitarama Sastri |
| 30-4-73 | 30-4-73 | 30-4-73 |
| (Maharashtra) | (Mysore) | (Andhra Pradesh) |

## APPENDIX B

### ABBREVIATIONS

(I) Technical terms

| | |
|---|---|
| I.M.C. | . thousand million cubic feet of water. |
| M. Cft. | . million cubic feet |
| Cft. | . cubic feet |
| ft. | . foot or feet |
| in. . . . | . inch |
| L.F. | . load factor |
| MkWh. | . million kilowatt hour |
| KW | . kilowatt |
| MW | . megawatt |
| kV . . . | . kilo volt |
| $C^0$ | . centigrade temperature |
| $F^0$ | . Fahrenheit temperature |
| hr. | . hour |
| lat. | . latitude |
| long. | . longitude . minimum |
| M.D.D.L. | draw-down level |
| M.D.S.S. | . Madras Detailed Standard Specifications |
| R.L. | . reduced level |
| F.R.L. | full reservoir level |
| mm | . millimetre |
| km | . kilometre |
| U/S | . upstream |

(2) Other terms

| | |
|---|---|
| AP | . Andhra Pradesh |
| MR . . . | . Maharashtra |
| MY . . . | . Mysore |
| K | . Krishna |
| G . . . | . Godavari |
| K-l to K-12 . | . sub-basins of Krishna basin |
| R.B.H.L.C. . | . Right Bank High Level |
| R.B.L.L.C. . | . Right Bank Low Level Canal |
| K..C. Canal . | . Kurnool-Cuddapah Canal |
| T.B. | . Tungabhadra |
| C.W. & P.C. | . Central Water and Power Commission. |
| C.W.& P.R. S. | . Central Water and Power Research Station. |
| pp. | . pages |
| Ann. | . Annexure |
| N . . . | . National |
| Ld. | . Edition |
| Art. | . Article |
| U.N. . | . United Nations |
| U.S.A. | . United States of America |
| COPP | . Committee on Plan Projects |
| K.G.C.R. | . Krishna Godavari Commission Reports |

*Certain volumes containing records of the Krishna case have been cited in an abbreviated form thus*

| | |
|---|---|
| MRK . . . . | Volume containing the pleadings filed in the Krishna case by the State of Maharashtra. |
| APK . . . . | Volume containing the pleadings filed in the Krishna case by the State of Andhra Pradesh. |
| MYK . . . . | Volume containing the pleadings filed in the Krishna case by the State of Mysore. |
| MPK | Volume containing the pleadings filed in the Krishna case by the State of Madhya Pradesh. |
| ORK | Volume containing the pleadings filed in the Krishna case by the State of Orissa. |
| MRDK | Volume containing relevant documents filed in the Krishna case by the State of Maharashtra. |
| APDK | Volume containing relevant documents filed in the Krishna case by the State of Andhra Pradesh. |
| MYDK | Volume containing relevant documents filed in the Krishna case by the State of Mysore. |
| MRPK | Volume containing Projects Reports or Notes filed in the Krishna case by the State of Maharashtra. |
| APPK | Volume containing Project Reports or Notes filed in the Krishna case by the State of Andhra Pradesh. |
| MYPK | Volume containing Project Reports or Notes filed in the Krishna case by the State of Mysore. |
| CWPC(K) . | Volume containing relevant documents obtained in the Krishna case from the Central Water and Power Commission. |
| MIP(K) | Volume containing relevant documents obtained in the Krishna case from the Ministry of Irrigation and Power. |
| SP . . . . | Volume containing Supplemental Pleadings. |
| PC(K) | Volume containing relevant documents obtained in the Krishna case from the Planning Commission. |

## APPENDIX C

### Agreement of 1892 between Madras and Mysore

GOVERNMENT OF MADRAS

(Public Works Department)

IRRIGATION

G. O. No. 162, 1 18th Feb. 1892 Irrigation works—Mysore State—Restoration and Construction—certain rules and schedules. Read the following paper:—

From General Sir H.N.D. PRENDERGAST, R.E., KCB V.C., Officiating Resident in Mysore to the Chief Secretary to Government, dated Bangalore, the 15th January 1892, No. 144/346-90.

With reference to correspondence ending with your letter Political No. 636, dated the 16th December, 1890. I have the honour to forward, for the formal acceptance of the Government of Madras, a copy of the rules and schedules regarding the restoration and construction of irrigation works in Mysore, prepared by the Mysore Darbar, which embody the arrangements which have been come to in an informal manner both by personal discussion and demi official correspondence between the Chief Engineer, Madras Irrigation Branch and the Chief Engineer in Mysore.

2. 1 shall be glad to be informed if the Madras Government agree with the rules proposed.

3. A copy of Colonel Bowen's letter on the subject is enclosed for information.

No. 3—1. dated the 4th January, 1892.

ENCLOSURES

From Colonel C. Bowen, R.E., Secretary to the Government of Mysore, Public Works Department to the Assistant to the Resident in Mysore, dated Bangalore, the 4th January, 1892—No. 3—1.

With his letter No. 1-A of 10th June 1890, the Diwan submitted to the Resident a memorandum on the subject of the restoration and construction of irrigation works in Mysore, the right to effect which without restriction had been disputed by the Madras Government. In that letter he urged the Resident to represent the matter in full to the Government of India, in view to a settlement of the Points at issue.

2. Colonel Sir Oliver St. John informed the Diwan in April last that the Government of India would prefer the matter to be settled, if possible, by some understanding between Madras and Mysore, and, before leaving Ootacamund, this year he, arranged for a conference between officers of the two Governments. Under such circumstances the Darbar again made endeavours, in conference with the Madras Government, to arrive at an amicable understanding regarding our future irrigation operations, so that controversy might be obviated in regard of individual works and a sphere of operations, declared in Mysore projects should be absolutely untrammelled. At the same time restric tions to be accepted by the Darbar on certain classes of work on certain rivers and in certain valleys which might affect prejudicially Madras works beyond the frontier.

3. The rules and schedules which I now forward embody the arrangements which have been come to in an informal manner by personal discussion or by demi-official communications, and I am desired to request you will be good enough to move the Resident to now obtain from the Government of Madras their formal acceptance of the same. They will then be adopted by Mysore for future guidance of the irrigation officers.

4. Annexed to the final rules and schedules is printed the demi-official correspondence which led to the modification of the rules after they were first framed and discussed at Ootacamund in May last. These letters will show that the general terms of the settlement have, with one exception, been informally agreed to by both Governments.

5. The exception I allude to is that referred into in the secondary clause to rule V. The decision of the Government of India will be necessary on that point viz., the existence of a liability on the part of Mysore, on account of three large reservoirs now act ually under construction, and if such liability exists, the extent of it; but the definite acceptance by Madras of the rules and schedules as now drawn up is desirable before the controverted cases are specially referred.

Transferred to the Public Works (Irrigation) Department 21st January, 1892.

J. F. PRICE
*Chief Secretary*

Order No. 162-1 (Public Works), dated 18th February, 1892. Ordered that the following letter be sent.

(True copy or extract.)

W. C. LEWIS,
*Under Secretary to Government*
P.W.D. (Irrigation Brandt).

To

The Chief Engineer for Irrigation, with copy of draft letter to the Resident.

"Political Department with draft letter to the Resident.

"Superintending Engineer, III Circle.

ANNEXURE TO G.O. No. 162-1

(PUBLIC WORKS), Dt. 18th Feb. 1892.

Rules defining the limits within which no new irrigation works arc to be constructed by the Mysore State without previous reference to the Madras Government.

I. In these rules :—

(1) "New irrigation reservoirs" shall mean and include such irrigation reservoirs or tanks as have not before existed, or, having once existed, have been abandoned and been in disuse for more than 30 years past.

(2) A "new irrigation Reservoir" fed by an anicut across a stream shall be regarded as a "New Irrigation reservoir across" that stream

(3) "Repair of irrigation Reservoirs" shall in clude (a) increase of the level of waste weirs and other improvements of existing irriga tion reservoirs or tanks, provided that either the quantity of water to be impounded, or the area to be irrigated is not more than the quantity previously impounded, or the area previously irrigated, by them; and (b) the substitution of a new irrigation reservoir for and in supersession of an existing irrigation reservoir but in a different situation, or for and in supersession of a group of existing irrigation reservoirs, provided that the new work either impounds not more than the total quantity of water previously impound-ed by the superseded works, or irrigates not more than the total area previously irrigated by the superseded works.

(4) Any increase of capacity other than what falls under "Repair of irrigation Reservoirs" as defined above shall be regarded as a

"New Irrigation Reservoir". ,

II. The Mysore Government, shall not without the previous consent of the Madras Government or before a decision under rule 4 below, build (a) any "New irrigation reservoirs", across any part of the fifteen main rivers named in the appended, Schedule A, or across any stream named in schedule B, below the point specified in column 5 of the said schedule B, or in any drainage area specified in the said schedule B or (b) any "New anicut" across the stream of Schedule A, Nos. 4 to 9 and 14 and 15, or across any of the streams of Schedule's, or across the following streams of Schedule A, lower than the points specified here under.

Across 1. Tungabhadra-Lower than the road crossing at Honahalli.

"10. Cauvery-lower than the Ramaswami anicut, and

"13. Kabani-Lower than the Rampur anicut,

III. When the Mysore Government desires to construct any "New Irrigation reservoir" or any new anicut requiring the previous consent of the Madras Government under the last proceeding rule, then full information regarding the proposed work shall be for warded to the Madras Government and the consents of that Government shall be obtained previous to the actual commencement of work. The Madras Government shall be bound not to refuse such consent except for the protection of prescriptive right already acquired and actually existing, the existence, extent and nature of such right and the mode of exercising it being in every case determined in accordance with the law on the subject of prescriptive right to use of water and in accordance with what is fair and reasonable under all the circumstances of each individual case.

IV. Should there arise a difference of opinion between the Madras and Mysore Government in any case in which the consent of the former is applied for

under the last preceding rule, the same shall be referred to the final decision either of arbitrators appointed by both Governments or of the Government of India.

V. The consent of the Madras Government is given to new irrigation reservoirs specified in the appended Schedule C, with the exception of the Srinivasasagara new reservoir across the Pennar, the Ramasamudram" new reservoir across the Chitravati and the Venkalesasagara new reservoir across the Papaghni. Should, owing to the omission of the Mysore Government to make or maintain these works in a reasonable adequate standard of safety, irrigation works in Madras, themselves in a condition of reasonably adequate safety, be damaged, the Mysore Government shall pay to the Madras Government reasonable compensation for such damage.

As regards three new reservoirs excepted above the admissibility of any compensation from Mysore to Madras on account of loss occurring to Madras irrigation works from diminution of supply of water caused by the construction of the said works, will be referred to the Government of India whose decision will be accepted as final, and should such compensation be decided, to be admissible, the decision of the Government of India as to the amount thereof will be accepted, after submission to them of the claims of Madras which would be preferred in full detail within a period of five years after the completion of said works.

VI. The foregoing rules shall apply as far as may be to the Madras Government as regards streams flowing through British territory into Mysore.

SCHEDULE 'A'

| Main Rivers | Remarks |
|---|---|
| 1. Tungabhadra . . | |
| 2. Tunga . . . | Tributary of Tungabhadra. |
| 3. Bhadra . . | -do- |
| 4. Hagari or Vedavati . | -do- |
| 5. Pennar or Northern Pinakini . . . | |
| 6. Chitravati . . . | Tributary of Pennar or Northern Pinakini. |
| 7. Papaghni . . . | -do- |
| 8. Palar . . . | |
| 9. Pennar known as the 'Ponniar' in Madras or Southern Pinakini. | |
| 10. Cauvery . . . | |
| 11. Hemavati . . . | Tributary of the Cauvery. |
| 12. Lakshmantirtha . . | -do- |
| 13. Kabani . . . | -do- |
| 14. Honhole (or Suvarnavati) | -do- |
| 15. Yagachi, upto the Belur Bridge | Tributary of the Hemavati. |

SCHEDULE 'B'

*A list of the Minor Streams and Catchments in Mysore Territory on which no new Irrigation Reservoirs are to be built within the limit specified without previous reference to the Madras Government.*

| Sl.No. in Schedule 'A' | Drainages | Sl. No. in map | Minor branches | Defined limit on a stream below which, or defined drainage area within which no new irrigation reservoirs are to be built without previous reference to Madras Government | Distance from frontier as measured up the stream (approximate) | Remarks |
|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 1. | Tungabhadra | l(a) | Charodi or Kumadvati | Upto the bridge on this river on Honnali-Shikarpur road | 10 miles | |
| | | 1. | Sulikere-halla | The bund of Sulikere tank | 46 miles | The Sulikere tank seldom discharges. This stream joins the Tungabhadra in Mysore territory. |
| | | 2. | Sagali-halla | Upto the boundary line of the Channagiri taluk. | 40 miles | About this point there are numerous existing tanks, and the run-off from these smaller catchments are of no appreciable importance to floods in the Tungabhadra river. |
| | | 3. | Sarati-halla | As far as the boundary line of the Kakkargola, and Avar-gola villages | 9 ½ miles | A stream of insignificant importance to floods in the Tungabhadra river. This stream joins the Tungabhadra river in Mysore territory. |
| | | 4. | Branch of Sarati-halla from east | Upto Kadaji tank bund | 16 ½ miles | Catchment above the Kadaji tank, small and insignificant. |
| | | 5. | North Hagari | Upto boundary of Chitaldrug taluk | 12 ½ miles | There are no existing Madras works on this branch of the Tungabhadra. |
| | | 6. | Branch of Hagari | Upto Anaji tank bund | 10 miles | -do- |
| | | 7. | Sokke-halla | Upto the Hoskere tank bund | 9 miles | No existing Madras works on this stream before it joins the North Hagari. Catchments above Kos-kere and Kyasenhalli tanks, very small and insignificant. |
| | | 8. | Branch of Sokke-halla | Upto the Kyasenhalli tank bund | 9 miles | -do- |
| | | 9. | Jiganhalli tank (Madras) catchment | The whole of the out lying bit of Mysore territory which drains into the Madras tank. | | This is an outlying bit of Mysore territory in latitude 14°-55' longitude 76°-38'. |
| | | 10 | Anantapur tank (Madras) catchment. | The whole of the area of the extreme northern portion of the Molakalmuru taluk in Mysore which drains northwards into the Anantapur (Madras) tank catchment. | | There are existing Madras tanks below, and the whole area which drains into such tanks is included. |
| IV | Vedavati or Hagari | 11. | Chinna-Hagari | Upto where the stream crosses the frontier near Rangayan-droog. | 16 miles | This stream joins the main river about 8 miles beyond the frontier. |

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| | | 12. | Sherikola-halla or Nagalapura tank (Madras) catchment | The whole catchment area in Mysore territory. | •• | Affects the supply to Madras tank below. |
| | | 13. | Rangasamudram tank (Madras) catchment | The whole area of catchment of the tank in Mysore territory. | | The stream from this catch ment leaves Mysore territory in latitude 14°-37'-30'' and longitude 76°-48'-30''. |
| | | 14. | Yeradkere tank (Madras) catch-ment | -do- | | The Yeradkere in Madras is on latitude 14°-30', longitude 76°-57'-30". |
| | | 15. | Main stream of the taluk drainage | Upto the bridge over this stream on the Salem-Bellary road. | 15 ½ miles | The road is a convenient point for a limit. This stream joins the Vedavati river within Mysore limits. |
| | | 16. | Main stream of the Doderi drainage | Upto the boundary of the Hosa-halli village. | 17 ½ miles | Latitude 14°-21' ; longitude 76°-49'. This stream joins the Vedavati river within Mysore territory. |
| | | 17. | Virappasamudram and Amarapur tank (Madras) catchment | The whole area of catchment of this series in Mysore terri-tory. | | This area represents a large proportion of the Pavagada taluk of Mysore. |
| V | Pennar or Northern Pinakini | 18. | Mulkalkara tank (Madras) catchment | The whole area of catchment of this series in Mysore terri-tory. | | This Madras tank is situated in latitude 14°-8' ; longitude 77°-26'-20". |
| | | 19. | Ruddam tank (Ma-dras) catchment | -do- | | A considerable area in the north of the Maddagiri taluk of Mysore is on this catchment. |
| | | 20. | Virapasamudram tank (Mysore) catchment | -do- | | This terminal tank is in S.F. corner of the Pavagada taluk of Mysore, but there are some Madras tanks above in the Madakasira Tahsil-dari. The catchment excluded from Mysore operations is chiefly in the north of the Maddagiri |
| | | 21. | Purgitank (Madras) catchment | -do- | | The catchment excluded from Mysore operations is in the north of the Maddagiri taluk. |
| | | 22. | Jayamangali river | Upto its junction with the Garu-dachala stream. | 28 miles | The river above this point is of minor importance to Madras. |
| | | 23. | Suvarnamukhi branch of Jaya-mangali | Upto site of Rampur anicut. | 25 miles | Joints the Jayamangali a few miles below this point. |
| | | 24. | Kumadvati | Upto the site of anicut feeding the Kodagatur and Gunda-gal tanks in Mysore. | 9 ½ miles | This stream joins the Pennar on the Mysore frontier. |
| | | 25. | Chaulur tank (Madras) catch-ment | The whole direct catchment of this tank in Mysore terri-tory. | | This Madras tank is on the west bank of the Pennar just outside Mysore territory. |
| | | 26. | Western or Thon-debhavi branch of the Pennar or N. Pinakini | Upto its source. | 27 to 30 miles | |
| | | 27. | Central or Var-vani branch of the Pennar or N. Pinakini | -do- | 25 miles | - |

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| | | 28. | Hindupur tank (Madras) catch-ment | The whole area of catchment of this series in Mysore territory | | An important and large area of the Goribidnur taluk is here excluded from Mysore operations in a part where water for irrigation is much appreciated. |
| VI. | Chitravati | 29. | Kushavati stream (Bukkapatna tank catchment in Madras) | Upto site of Daparti anicut | l0 ½ miles | The large Gudibanda tank in Mysore and the 20 smaller tanks above impound a very large proportion of the Upper catchment already. |
| | | 30. | Chitravati catch-ment (Bukkapatna tank catchment) | The whole area to the North of the Chelur-Bagenhalli road | | This portion of the Chitravati catchment being more hilly and barren, the runoff is greater than in the more cultivated and level catchment to the south of the Chelur-Bagen-halli Road. |
| VII. | Papaghni river | 31. | Vademan-halla | Upto Naremadipalli tank | 9½ miles | No Madras works affected upto the junction of this stream with the Papaghni river. |
| | | 32. | Guntpalli tank (Madras) catch-ment | The whole area of catchment in Mysore territory | | This Madras tank is situated just above the large Vyasa-samudram tank. |
| | | 33. | Sadam tank (Madras) catchment | The main stream up to its source | 17 to 18 miles | This Madras tank, the water-spread of which is partly in Mysore territory drains into the Papaghni river just above the Vyasasamu-dram tank. |
| | | 34. | Kotagal branch of the Papaghni | Upto Kotagal tank | -do- | The catchment above Kotagal tank is comparatively small and unimportant with numerous small tanks already on it.- |
| | | 35. | Tippasamudram tank (Madras) catchment x | The Marasanappalli Digavakote stream upto Digavakote patha-cheruvu tank, and the Mara-sanappalli Gundedu stream upto Gundedu tank | 9 ½ miles 13 miles | These are the only two im-portant streams on this catchment, and above these terminal tanks there are a large number of small tanks on the small drainages. These terminal tanks are only situated from 4 to 5 miles from the water-shed of the Palar. |
| | | 36. | Rangasamudram tank (Madras) catchment | Adgal stream upto Adgal Vasantanayikankere tank. | 6 ½ miles | The Adgal tank is situated 6 miles from the watershed, and there are numerous tanks in this distance. |
| | | | | Kurigepalli branch stream upto the Kurigepalli tank | 4 ½ miles | The Kurigepalli tank is only 4 miles from the water-shed, and there are some 18 small tanks above it. |
| VIII. | Palar River | 37. | Nangli (Mysore) tank drainage | Main stream upto its source | 17 ½ miles | There are 12 Mysore tanks situated on this main stream. |
| | | 38. | Shettikal (Mysore) tank drainage | -do- | 10 miles | There are about 5 existing Mysore tanks and 1 breached tank on this main stream. |
| | | 39. | Malinayakanhalli (Mysore) drainage | -do- | 6 1/2 miles | There are 4 existing Mysore tanks on this main stream. |

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| | | 40. | Vegmadgu (Mysore) drainage | Main stream upto its source. | 7 miles | There are 4 existing , Mysore tanks on this main stream. |
| | | 41. | Tailur tank (Mysore) drainage | -do- | 23 miles | There are 10 Mysore tanks on this important branch of the Palar, the terminal tank being 12 1/2 miles from the frontier. |
| [X. | Pennar* or Pinakini | South 42. | Verushuvavati river | Main stream upto Koppa (or Kuppam tank). | 16 miles | There are 76 tanks above the Koppa tank which is only some 12 miles from the water-shed. |
| | | 43. | Budikote stream | Main stream upto Thimmanayakanhalli tank. | 21 miles | There are 146 tanks above this terminal tank which is only about 12 miles from the water-shed. |
| | | 44. | Masti catchment | The whole area of catchment in Mysore Territory. | | About 45.40 sq. miles in area in which there are 63 tanks in existence. |
| | | 45. | Kadgodi drainage | Main stream upto its source. | 36 miles | There are 10 Mysore tanks on this main stream now in use, most of them of large size. |

*Known as the "Ponniar" in Madras.

## SCHEDULE 'C'

*A list of work already in progress, and which are to be allowed to be completed, although they would be barred by the proposed rules for restriction of Mysore operations*

| Sl. No. in Schedule A | Main river drainage | Sl. No, of stream or catchment in schedule | Name of work in progress | Date on which work was sanctioned | Amount of estimate in Rs. | Expenditure incurred to end of March, 1891 | Descriptive remarks |
|---|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| I. | Tungabhadra | | | | | | No works in progress on these catchments which are affected by the proposed rules submitted to Madras. |
| II. | Tunga | | | | | | |
| III | Bhadra | | | | | | |
| IV. | Hagari or Vedawati | 17 | Restoration of the Arsikere-Hampaiyandurga tank | May, 1889 | 4,362 | | The estimate provides for raising the weirs by 2 feet and increasing capacity from 107 to 163 units. Work in abeyance owing to objection raised by Madras Government. But it is not intended to irrigate, more than the area of land (189 acres) assessed as wet by the revenue survey. |
| v | | 17 | Restoration of the Arsicere-Gujjaranpankere Tank | -do- | 3,582 | | The estimate provides for raising the weir by 1 foot and to increase the capacity from 149 to 186 units. The raising of the weirs by 1 foot will not do more than compensate for the silting up of the bed for years. |
| *V.* | Pennar or Northern pinakini | Main stream | New reservoir (Srini- vasagars) across the river near Kotagara-halli. | July 1888 | 99,206 | 66,696 | This new masonry dam with earthen, bund on flanks is two-thirds completed. No Madras works affected. The capacity of the tank will be 610 units and it is intended to irrigate 800 or more acres. This work is referred to by Colonel H. Smalley, R.E., in his No. 674, dated l0th June, 1890, to Chief Engineer for Irrigation, Madras. |

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|
| | | 28 | Restoration and improvement of Myalya tank | Sept 1887 Dec. 1889 | Original estimate 14,452 Revised estimate 17,168 | 13,130 | The capacity was increased from 95 units to 318 units, and the work is nearing comp-letion. This tank is on the Hindupur (Madras) tank catchment but only has a catchment of 38.80 sq. miles of its own. |
| | | 28 | Raising the weirs of Mahamaleswara tank. | Sept. 1890 | 3,165 | 865 | This is a small tank above the Myala noted above. The estimate provides for increasing the capacity of the tank from 62 to 102 units, the for-mer capacity having proved insufficient to irrigate the 198 acres of assessed wet lands. No increased area of irrigation is provided for the total catchment above this tank is only 3 sq. miles. |
| | | 28 | Restoring the Manivala tank | Feb. 1889 | 4,094 | 2,860 | The tank weir is to be raised 2 feet, and capacity increased from 139 to 211 units, but only in order to impound sufficient water to irrigate the tanks original atchcut of 350 acres. |
| VI. | Chitravati | Main Stream | in New Reservoir (Ramasamudram) near peri yasandra. | May , 1888 | 75,077 | 51,824 | This reservoir is noticed by Colonel H. Smalley R.E. in his No. 674, dated 10th June 1890 to Chief Engineer for Irrigation. It is to have a capacity of 1,207 units to irrigate 1,200 acres. The catchment area above the tank is 47.61 sq. miles. |
| | | 30 | Restoration of the Malsandra-Rachevar tank. | Dec. 1888 | 4,742 | 4,724 | Weirs of the tank were raised 2 feet increasing the capacity from 105 units to 159 units It is not intended to increase the area originally irrigated, 258 acres. The capacity of the tank is even now insufficient unless the tank fills l ½ times in the year. Work is nearly completed. |
| VII. | Papaghni River | Main Stream | New reservoir (Venkatesagara) near Devaganhalli | June, 1888 | 60,985 | 28,423 | This work is noticed by Colonel H. Smalley R.E. in his No. 674 dated 10th June 1890, to Chief Engineer for Irrigation, The tank will impound 517 units as designed, and will perhaps irrigate 750 acres if it fills 1 ½ times. The catchment above the tank is 61 sq. miles. |

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|
| | | Main Stream | Restoring the Buradagunte anicut, channel and tank. | Dec. 1888 | 25,575 | 17,350 | This work consists in (1) building a masonry anicut with the usual earth Hank bunds across the main stream (2) restoring the old channel therefrom & (3) restoring the Buradagunte Timmasani tank and increasing its capacity from 111 units to 167 units. This project is also noticed by Colonel Smalley in his report No. 674 dated 10-6-1890. |
| | | | Restoring the Timmanayakanhalli Agrahar tank. | Aug. 1888 | 16,776 | 13,234 | Noticed also in Colonel Smalley's letter above quoted. This is a restoration of an old breached tank 26 miles up the main stream and 2 miles above the Chintamani Bagenhalli road. The tank is to impound 240 units and irrigates 250 acres as against its original atchakat (irrigable area) of 330 acres as per revenue survey maps. Work is nearing completion. |
| | | 35 | Restoring Kotekallur tank. | Apr. 1888 | 6,564 | 5,690 | This project consists in the restoration of a tank which breached in 1874, and for increasing its capacity from 25 to 80 units. It is 6 miles from the frontier on the Tippasamudram (Madras) tank catchment. |
| VIII. | Palar River | 37 | Restoring the Byatnurnagavara tank. | Sept. 1888 | 14,300 | 8,102 | This is the terminal tank of the series. The capacity being increased from 152 to 320 units, it is only intended to irrigate the original area of 365 acres included in the atchakat. |
| | | 37 | Restoring Marandhalli tank. | March, 1886 revised estimate in July, 1888 | 5,345 | 5,254 | The project provides for raising the weirs 3 feet and increasing the capacity from 121 to 186 units, to irrigate, perhaps 250 acres. Work is nearing completion. |
| | | 41 | Restoring Jagalkashti-Dodkere tank. | April, 1888 revised estimate in Jan. 1890 | 7,246 | 7,210 | Project provides for raising the weirs 3 feet and increasing the capacity from 50 to 107 units. Work is nearly completed. No Madras works affected. |

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|
| IX. | Pennar* or Southern Pinakini | Main | Restoring Bhadram tank | April, 1888 | 21,689 | 15,033 | The project provides for raising the weirs of this tank by 3 feet and increasing the capacity from 701 units to 1,225 units. The work to the tank itself is nearly completed and only channels have now to be extended. |
| | | 44 | Restoration of Santhalli tank. | Nov. 1889 | 7,480 | 4,076 | This tank is in ,the Masti catchment. The weirs are to be raised 3 feet and capacity increased from 93 to 154 units. No Madras works are affected. |

*Known as the "Ponniar" in Madras

## APPENDIX D

### Agreement of 1933 between Madras and Mysore

G.O.No.2796.I/Dated 28th Dec. 1933.

**Appendix I**

Agreement Reached at the Conference of Mysore and Madras held in the Secretariat at Bangalore on 4th and 5th September, 1933.

(1) As regards repairs to Irrigation reservoirs falling within the definition in rule 1(3) of the Agreement of 1892—whether they involve the increase of the level of waste weirs the construction of new reservoirs in substitution of old ones—intimation will, as far as possible, be given by Mysore in future before the work is commenced with details of what is proposed to be done. The Madras Government will, as far as possible, give similar information in respect of similar works in the Madras Presidency which may affect the prescriptive rights for which protection may be claimed under the rules in the Agreement of 1892.

(2) By analogy, the construction of new anicuts in place of existing ones will be treated similarly, but Mysore and Madras Governments will, as far as possible, give similar-intimation before work is commenced.

(3) An anicut will include any construction of rough stone (dry) or masonry across a river either in part or fully and in any direction, which will have the effect of diverting water from the river, but the consent of the Madras Government will not be required under the Agreement of 1892 for the construction of any new anicut if there is to be no irrigation under it.

2. Construction of a new tank across the Bandihalla at Thippaganahalli, Goribidnur taluk—if the Mysore Government agree to reduce the maximum storage capacity of the Srinivasasagara by 200 units to 410 units and to reduce the maximum atchcut by 100 acres to between 700 and 800 acres, the Madras Government will consent to the proposal to construct the new tank with a storage capacity of about 450 units and an atchcut of 600 acres.

3. Rajavanti tank, Pavagada taluk—The recommendations made in the notes of joint inspection are accepted as equitable to both the Governments.

4. Distribution of water of the Swarnamukhi, tributary of the Hagari between the British Agali channel and the Mysore Kittagali channel—The Mysore Government agreed to the provision of shutters for the vents to be reopened in the anicut, provided that they are operated not necessarily after the Agali tank fills, but as soon as the flow in the Agali channel attains a certain height, which will be determined by agreement between the two Chief Engineers,

The draft agreement, already forwarded, may be concluded with this modification.

5. Diversion of water from the Handihalla stream into the supply channel to the Bodimarlur tank—As the Mysore Government have shown from records that the tank is an old one which existed at the time of the Agreement of 1892, and had then an irrigated area not less than it has now, the proposals of the Mysore Government will be accepted.

Note:—The Mysore Government will send a note on this subject. (This they have done.)

6. Distribution of waters between the Mysore village of Katamaguntapalli and the British village of Byrangi in Chittoor district—After examining the plans of the anicut and head works and the irrigation interests of the ryots of both parties, it was agreed that the two existing channels in the river bed leading to the respective vents in the anicut may be linked by Madras by means of a connecting channel parallel to the anicut somewhere above it, subject to the condition that the Mysore Jodidar shall have a right to put up a temporary cross-bund, not exceeding 18 inches above the cill level of the vents in the anicut across this connecting channel and also a temporary cross-bund across the Byrangi channel just below the existing regulator, in order to enable him to utilise the summer flow between 1st January and 30th April every year.

7. Groyne wall at the head of the Gangasandra feeder channel from the North Pennar—As the object of the feeder is to divert flood waters and not low supplies, Mysore has no objection to dismantling, if considered necessary, a portion of the groyne wall, retaining the remaining length so as to give an entrance to the channel during floods. In order to determine by mutual agreement what exactly this length should be, it was agreed to make a joint survey of the river at the feeder head.

8. Rampur anicut across the Jayamangali river—It is agreed to allow the anicut to remain as construct ed, on the understanding that the size and the number of vents in it and the head sluice, of the channel will be altered by Mysore, if this is found necessary after an examination of the figures of irrigation under the anicut and lower down the river both in Mysore and British limits, which figures should be furnished as early as possible by either party to the other, the interests of the direct irrigation under the channel from the anicut being adequately safeguard.

9. Interception of the supplies to the British Manchnillu cheruvu of Kodikonda village in the Hindupur taluk—It is agreed that there is no objection to closing the vents in the anicut since they have been held to be vents left during the construction of the anicut.

10. Application of the definition of "Repairs to irrigation reservoirs" to "Repairs of anicuts" by analogy—This is agreed to [Vide Item 1 (2)]. It is also agreed that there should be no objection to Madras carrying out simple or ordinary repairs to anicuts or other works of the Madras Government situated in Mysore territory. An intimation will be given to the Mysore Government of what is proposed to be done in such cases.

11. Deficient supplies in the Jayamangali river—The Mysore Government agree to supply to the Madras Government figures of storage and irrigation under the tanks and channels fed from the river in Mysore territory below its junction with the Garudachala river.

12. Deficient supplies in the Palar river—The My sore Government agree to examine whether and to what extent, it is possible to supply the information asked for by the Madras Government, and if so, at what cost.

M. G. RANGIAH,

*Chief Engineer and Secretary to the*

*Government of Mysore*

*Dated 5th September,* 1933

N. GOPALASWAMI,

*Secretary to the Govt. of Madras,*

*Public Works and Labour Department*

*Dated 5th September,* 1933

## APPENDIX E

### Agreement of June 1944 between Madras and Hyderabad

Conclusions reached at the Conference held at Shah Munzil, Hyderabad, on the 24th, 25th and 26th June 1944 in regard to the Scheme for the Partial Utilisation of the Tungabhadra Waters.

**Present:—**

*On the Madras side:*

Mr. S. V. Ramamurthy, C.I.E., I.C.S., Fourth Advisor to His Excellency the Governor of Madras, Representative, Government of Madras.

Sri Rao Bahadur N. Govindaraja Ayyangar, B.A., B.E., Chief Engineer for Irrigation, Madras.

Sri A. R. Venkataraman, B.A., B.E., Deputy Chief Engineer for Irrigation, Madras.

*On the Hyderabad side:*

Nawab Ali Nawaz Jung Bahadur F.C.H., Consulting Engineer, Representative, His Exalted Highness the Nizam's Government.

Mr. Md. Anwarulla, B.Sc., Chief Engineer, P.W.D.. Hyderabad.

Mr. C. C. Dalai, B.E., A.M.I.C.E.. Superintending Engineer, Hyderabad.

Mr. Khaja Azeemuddin, B.Sc., A.C.G.I., Special Engineer, Hyderabad.

(Mr. Dalai was not present during the discussions on the 26th).

The Conference was without commitment on either side, i.e., the conclusions arrived at would not be binding unless and until they are ratified by the two Governments.

2. The object at present is to make it possible to start immediately a joint scheme between Hyderabad and Madras for a partial appropriation of the Tungabhadra waters at Mallapuram leaving all matters of absolute rights and claims and disputed points for future settlement.

3. It is agreed that this agreement will supersede the previous agreement of 7th November, 1938.

4. It is agreed that Madras and Hyderabad may each draw off 65 Thousand Million Cubic Feet (including evaporation losses) from the reservoir to be constructed across the river Tungabhadra at Mallapuram. The total abstraction of water from the reservoir for use under the Tungabhadra works will be 130,000 Million Cubic Feet and no more under the present arrangement. This will be open to consideration as in paragraph 5 below. This quantity will provide for the needs of all the irrigation under the Tungabhadra works i.e., the needs of the new and pre-Moghul irrigation and also the assistance to the Kurnool-Cuddapah Canal and the Rajulibanda canal proposed by Hyderabad, the latter being treated on an equal status with the former. This scheme of equal abstraction of water is not to be considered as any settlement of the rights in the waters of the Tungabhadra nor is it to serve as a basis for the building up of any rights of the Governments concerned.

5. Madras asked that the share of each Government in this partial allocation should be 75 Thousand Million Cubic Feet. Hyderabad could not see their way to agree to an allocation of more than 65 Thousand Million Cubic Feet immediately. It was agreed that the raising of the figure of 65 Thousand Million Cubic Feet will be examined after ten years from now or such later date as the two Governments may agree to, considering the needs of the projects.

6. Madras first claimed the low flows up to their requirements for the Tungabhadra and Kistna irrigation, but later agreed to forego this claim in the present arrangement, the needs of such irrigation being provided for by regulated supplies from the reservoir.

7. The contribution to the Kistna will be met by regulated supplies from the reservoir and such waters can be utilized to develop power both by Hyderabad and Madras but will not be debited to the 65 Thousand Million Cubic Feet mentioned in paragraph 4 above.

8. It will be left to the option of the respective Governments to supply through the existing head-sluices
in the river or otherwise the pre-Moghul channels.

9. Natural flow in the river below the Mallapuram reservoir, i.e., floods from the reservoir, flow from intermediate catchment and separate into the Tungabhadra river, can be utilized by Madras and Hyderabad for pre-Moghul irrigation in Madras and Hyderabad and also for irrigation under the Rajulibanda canal of Hyderabad and the Kurnool-Cuddapah canal of Madras. These waters realized at the points of diversion will be drawn to the limit of their requirements in the pre-Moghul channels but at the point of diversion of the Rajulibanda canal the natural flow will be divided half and half between Madras and Hyderabad after making an extra allowance to the Rajulibanda canal equivalent to the additional draw-off by the Madras pre-Moghul channels over the draw-off of pre-Moghul channels of Hyderabad.

10. If either Government use the river for carrying water down to any lower point on the river, such Government shall retain their property rights in those waters.

11. Madras and Hyderabad are prepared to have the dam constructed to impound a sufficient quantity for a larger eventual utilisation than now agreed to, and to bear half the cost of such construction.

12. Madras and Hyderabad need not restrict their canal capacities to utilize their present share of 65 Thousand Million Cubic Feet each. In designing them for larger capacities each Government take their own risk.

13. So far as this Conference goes, it has been conducted in order to facilitate a joint partial scheme between Hyderabad and Madras without prejudice to the rights and interests of the other Governments concerned.

14. The following matters will be subject to examination by the Chief Engineers of Madras and Hyderabad who will arrive at a common settlement which will be subject to ratification by the two Governments:—

(a) Whether it is necessary to provide one set or more of sluices on each side for the requirements of new irrigation, old irrigation and for contribution to the Kistna.

(b) To fix the full reservoir level and sills of sluices and also the minimum level below which water may not be allowed to go down, no party being entitled to ask for a higher level to be maintained at any time, when once the minimum level is fixed.

(c) To determine, the contribution to the Kistna and the period over which it is to be distributed keeping in view the requirements of irrigation and development of seasonal power for not less than six months.

(d) To determine the apportionment between the two Governments, of the contribution to the Kistna to be drawn for power purposes, giving some weightage to Hyderabad for the reason that at present such water will be used only for power by Hyderabad and for power and irrigation by Madras. This weightage is to apply until a Kistna reservoir comes to function.

(e) To examine and give their views as regards the estimate of the dependable supply at Mallapuram now put at 336 Thousand Million Cubic Feet.

(f) To examine and give their views as regards
the extra allowance to be given to the Rajolibanda canal from the natural flow of the river at Rajolibanda anicut as per paragraph 9 above fixing on a percentage basis the allocation of natural flow at Rajolibanda anicut between Madras and Hyderabad.

S. V. RAMAMURTHY,

*Representative, Govt. of Madras*

*Dated 26th June,* 1944

ALI NAWAZ JUNG,

*Representative, His Exalted Highness*

*the Nizam's Govt.*

Dated 26th June, 1944

## APPENDIX F

### July, 1944 agreement between Madras and Mysore in regard to sharing of Waters of Tungabhadra River

Agreement between the representatives of the Government of Madras and Mysore in regard to the sharing of the waters of the Tungabhadra.

Whereas the Government of Madras propose to construct a reservoir on the Tungabhadra beyond the territory of Mysore;

And whereas the Government of Mysore also propose to construct a reservoir at Lakkavalli or at any other place on the Bhadra (hereinafter referred to as the Lakkavalli Reservoir) a tributary of the Tungabhadra;

And whereas the Governments of Madras and Mysore consider it necessary and expedient to come to a settlement *inter-se* in regard to the sharing of the waters of the Tungabhadra Basin above Mallapuram;

And whereas the question of the sharing of the waters of the Tungabhadra Basin between the Governments of Madras and Mysore and the question relating to Sivasamudram royalty payable by the Government of Mysore to the Government of Madras were discussed by the Representatives of both the Governments at Fort St. George, Madras, on 3rd, 4th and 5th December, 1936;

And whereas the Governments of Mysore and Madras have come to a mutual settlement in regard to the sharing of the waters of the Tungabhadra Basin above Mallapuram and in regard to the amount of royalty-paid to the Government of Madras in respect of utilisation of their share of the waters in the Cauvery at Sivasamudram by the Government of Mysore for power purposes;

And whereas the waters of the Bhadra and Tungabhadra were jointly guaged by the Representatives of the Governments of Madras and Mysore at Lakkavalli, Mallapuram and Sunkesula anicut;

And whereas as a result of the said gauging and discussion, the net dependable flow at Mallapuram after meeting the requirements of existing irrigation above Mallapuram, was agreed to as 3,40,000 Million Cubic Feet.

Now these presents witness that His Excellency the Governor of Madras and the Government of Mysore do hereby agree and bind themselves, their successors and representatives as follows:—

**PART I—Relating to "Sharing of the waters of the Tungabhadra."**

1. From the total yearly flow of the Bhadra river at Lakkavalli, the Government of Mysore shall be entitled to draw off through sluices a quantity of water not exceeding 57,000 Million Cubic Feet, net for irrigation and power purposes from the Lakkavalli Reservoir. The Reservoir shall be of such capacity as may be agreed upon between the two Governments and as is necessary to enable the Government of Mysore to draw off annually through sluices 57,000 Million Cubic Feet, referred to herein and the additional quantity referred to in clause 6.

The Government of Mysore shall not be entitled to draw any supply for any purpose at any other point on the Bhadra river save and except the Government of Mysore may draw off water:—

(a) For supply to factories and towns from the said river ;

(b) at the existing Bhadra anicut for the irrigation of an area not exceeding 20,800 acres inclusive of the area now irrigated from the anicut.

Neither the existing Bhadra anicut nor its scouring sluices nor the head sluices for the right and left bank channels shall be altered in any manner save with the previous consent of the Government of Madras, which consent shall not be unreasonably withheld or refused.

Nothing in this clause shall be deemed to affect the rights of the riparian landowners to take water to which they may be entitled under the law.

2. The Government of Madras agree to the Government of Mysore increasing the capacity of the Lakkavalli reservoir beyond the limit permissible under the clause 1 in order to enable the Government of Mysore to have additional storage solely for power purposes, the supply required for such purposes being drawn off through the sluices, but such additional storage shall be returned without diminution (except diminution by reason of evaporation and per colation) within the same year to the river Bhadra above the existing Bhadra anicut through sluices or in such other manner as may be mutually agreed upon by the Governments of Madras and Mysore and in accordance with the working tables and rules of regulation approved by the Chief Engineers of the two Governments.

3. The Government of Mysore agree to furnish full details of the works proposed to be executed by them in pursuance of clauses 1 and 2 together with the rules of regulation proposed for the new Reservoir, to the Government of Madras, and obtain their specific consent of such execution and to those rules before starting such works and the said consent shall not be unreasonably withheld or refused.

4. The Government of Mysore also agree to prepare and furnish to the Government of Madras detailed working tables showing how the Government of Mysore propose to give effect to clauses 1 and 2 and the rules of regulation referred to in Clause 3. Separate working tables shall be prepared to show :—

(a) the capacity of the reservoir required to ensure to the Government of Mysore the draw off of 57,000 Million Cubic Feet referred to in clause (1) and the additional quantity referred to in Clause 6 ; and

(b) the capacity required in addition to ensure the Government of Mysore, their power requirements according to Clause 2.

If when working tables are drawn up it is found that the supplies to existing irrigation as it stood in 1936 below Lakkavalli reservoir would be adversely affected by the draw off for irrigation or power purposes under clause 1 or clause 2, the working tables and rules of regulation shall be so revised as to provide for passing such flow, limited to the natural flow, down the river as may be necessary to safeguard the interests of such existing irrigation as well as to ensure the draw off for the Lakkavalli reservoir as provided in this agreement.

The Chief Engineers of the Governments of Mysore and Madras will prepare the working tables after such examination as may be necessary and come to a common speedy settlement in the matter of proportion factors, rules of regulation, monthly limit flows, etc., which will be subject to ratification by the two Governments; and on such ratification such settlemerit shall be deemed to form part of this agreement.

5. The Government of Mysore further agree that immediately the draw off from the Lakkavalli reservoir mentioned in clause 1 begins, issues from the reservoir shall conform to the working tables mention ed in Clause 4.

6. The Government of Mysore shall also be per mitted to draw off for all their new irrigation (in cluding extension to existing irrigation) in the Tungabhadra Basin above Mallapuram besides the water which the Government of Mysore may draw off at the existing Bhadra anicut (under clause 1) a total quantity of water not exceeding 15,000 Million Cubic Feet, (Evaporation losses being included in this quantity only in the case of tank and reservoir schemes) in the aggregate in the year provided that such draw off shall not take place from the Bhadra. Nothing in this clause shall be deemed to effect the rights of the Government of Mysore to draw off water for factories and towns from the water-courses in the Tungabhadra Basin or the rights of the riparian land owners to take water to which they may be entitled under the law.

The Government of Madras note that the Government of Mysore have already prepared a scheme for utilizing not more than 11,500 Million Cubic Feet, from an anicut to be constructed across the Tunga near Sacrebyle. The Government of Mysore will be at liberty to proceed with this scheme and the quantity of water drawn off at the anicut shall count towards the 15,000 Million Cubic Feet, herein mentioned. In the event of the Government of Mysore not utilizing the 11,500 Million Cubic Feet for the above scheme, the Government of Mysore shall be at liberty to utilize the unutilized quantity for schemes in the minor valleys in the Tungabhadra Basin. Such unutilized quantities shall include evaporation losses.

Full details of every other scheme proposed to be executed by the Government of Mysore for the draw off the remaining quantity shall be furnished to the Government of Madras and their specific consent obtained before work is started on the scheme. In

framing such schemes the interests of all existing, irrigation in the respective valleys extending upto the Tungabhadra river shall be fully safeguarded.

In the event of the Government of Mysore being unable for any reason to frame such schemes for valleys other than the Bhadra valley in the Tungabhadra Basin above Mallapuram, or if the Government of Madras should withhold or refuse consent to any such scheme, the Government of Mysore shall be permitted to draw off from the Lakkavalli reservoir a quantity of water not exceeding 3,500 Million Cubic Feet, (including evaporation losses) out of the unutilized quantity of the said 15,000 Million Cubic Feet. This draw off shall be in addition to the 57.000 Million Cubic Feet, refered to in Clause 1.

7. The means and methods of measuring all in flows, issues draw off, and the like at any of the works authorised by the Clauses 1 and 2 or by clause 6 shall be settled by the Chief Engineers of the Governments of Madras and Mysore before such works are started.

8. For the purpose of this Agreement "the year" shall commence on such dates as may be fixed by mutual agreements between the Chief Engineers of the Governments of Madras and Mysore, after work ing tables for such years as may be agreed upon by the two Chief Engineers have been drawn up and approved by them.

9. After the draw off to which the Government of Mysore is entitled under clauses 1 and 6 and after making an allowance of 12,000 Million Cubic Feet, for miscellaneous irrigation above Mallapuram, there will be available at Mallapuram an estimated supply of 2,56,000 Million Cubic Feet in respect of which the Government of Mysore do not claim any share as against the Government of Madras.

10. The Governments of Mysore and Madras agree that so far as they are concerned, the foregoing clauses shall constitute a final settlement of the rights of the respective Governments in the waters of the Tungabhadra Basin above Mallapuram.

If at any time at the instance of any other party claiming a right to the waters of the Tungabhadra it becomes necessary to have recourse to arbitration in respect of the sharing of the Tungabhadra waters and if the arbitration tribunal were to award to the Governments of Mysore and Madras a quantity different from those referred to in clauses 1, 6 and 9 above, the two Governments hereby agree to abide by such award.

The Government of Madras agree that the Siva-Samudram royalty of Rs. 20,000 per annum now agreed to--vide Part II of this agreement shall—not in any circumstances, be re-opened or revised.

11. Nothing contained in the foregoing clauses shall be deemed to qualify or limit in any manner the operation of the agreement, dated the 18th February, 1892, between the Governments of Madras and Mysore in regard to matters other than those to which this agreement relates.

12. The Government of Madras and Government of Mysore hereby agree that if at any time there should arise any dispute between them touching the interpretation or operation or carrying out of this agreement, such dispute shall be referred for settlement by the two Arbitrators, one to be appointed by each Government and in case of difference of opinion between the Arbitrators, the matter shall be referred to an Umpire appointed by both the Governments.

**PART II—Relating to the Sivasamudram Royalty**

13. In consideration of Government of Mysore agreeing to the foregoing clauses in Part I the Government of Madras agree, in modification of the terms accepted by the Government of Mysore in their letter No. 150-D.C., dated 26th May, 1900, regarding the royalty payable by the Government of Mysore for the utilization of the waters of the Cauvery Falls at Sivasamudram for the generation of electrical power, to accept (in lieu of the payment of Rs. 5 per electric horse power per annum for half the total water power utilized), a consolidated sum of Rs. 20,000 per annum with effect from the date of the expiry of the previous agreement.

Provided always that any water diverted from the river above the falls for the generation of power shall be returned to the river below the falls without being fouled or diminished in quantity as explained in letter No. 4221/302-94, dated 24th August 1900, from the First Assistant to the Hon'ble the Resident to the Diwan and that the other terms and conditions

of the previous agreement, namely, those contained in sub-paragraphs (iv) and (v) of paragraph 3 of the Government of Mysore's letter referred to above and herein reproduced below shall continue in full force.

OTHER TERMS AND CONDITIONS REFERRED TO

"(iv) that a cessation on the part of the Darbar to utilize the water of the falls for the generation of electrical power for two years shall operate to terminate the agreement;

(v) that for purpose of power works the Darbar to be vested with the control over the discharge in the river and its branches at and above the falls and to be permitted to build two low dams, subject to the following stipulations:

(a) that the Darbar shall not restrict or interfere with the amount of water for irrigation or other purposes, to which amount the Jaghirdar of Sivasamudram may be legally entitled; and

(b) that the Darbar shall reimburse and make good to the Madras Government all loss or damage which under the decision of a competent civil court may secure in consequence of the Darbar's operation through the infringement of the legal rights of private persons."

N. MADHAVA RAO,

*Representative, Govt. of Mysore.*

*G.* W. PRIESTLEY,

*Representative, Govt. of Madras.*

Dated 24th July, 1944.

## APPENDIX G

### Supplement to 1944 Agreement executed in December 1945 by the representatives of Governments of Hyderabad, Mysore, Madras and India.

A. Mysore may proceed with the construction of the Sacrebyle anicut on the Tunga river subject to the condition that pending the construction of the Tungabhadra Dam. Mysore shall not extract supplies from the Tunga at the Sacrebyle anicut during low flow period when such extraction is likely to adversely affect the existing Pre-Moghul irrigation. To ensure that the spirit of this clause is complied with regulation rules in this respect shall be framed by the Chief Engineers of the three Governments.

B. With regard to allowance for the rights of the Government of Mysore to draw off water for factories and towns from the water course in the Tunga bhadra basin or the right of the riparian land owners to take water to which they may be entitled under the law or for the minor tanks in the Tungabhadra basin Hyderabad agrees to a specific figure limited to 4,000 M. Cft. of water.

C. Regarding the quantity of 57,000 M. Cft. Exclusive of evaporation losses at the Lakkavalli reservoir under Clause (1) of the Mysore-Madras Agreement, Hyderabad does not commit herself either way to its acceptance or otherwise and shall be free to act under Clause (10) sub para (2) of that Agree ment. Subject to the above, Hyderabad does not object to the construction of the Lakkavalli reservoir.

D. The extension of irrigation from the existing Bhadra Anicut provided for under Clause (1) (b) of the Madras-Mysore Agreement, shall be permitted to subject to the same condition as laid down for the irrigation from the Sacrebyle scheme, mentioned under (A) above.

E. The Governments of Hyderabad, Madras and Mysore recognise the claims of Sangli, Bombay and any other riparian areas (excluding those of Mysore, Madras and Hyderabad which are already covered by the two Agreements between Madras and Hyderabad and Madras and Mysore) to an equitable share of waters which shall be decided by a tribunal set by the Government of India for the purpose of final appor tionment of the Tungabhadra water between all the interested parties. Further the three Governments agree that the schemes under the two Agreements mentioned above are not intended to prejudice in any way the claims of Bombay, Sangli, etc.

F. In Clause (2) of Madras-Mysore Agreement substitute "Below" for "Above" in the sentence "… .....river Bhadra above the existing Bhadra Anicut ..... "

Sd.
(Ali Nawaz Jung)

| | |
|---|---|
| Sd. | Sd. |
| (A. N. Khosla) | (S. M. Younus) |
| 24-12-1945 | 24-12-1945 |
| Sd. | Sd. |
| (M. Narasimhaiya) | (A. R. Vankatachari) |
| 27-12-1945 | 26-12-1945 |
| Chief Engineer for Irrigation (Mysore). | Chief Engineer for Irrigation (Madras). |

## APPENDIX H

### Supplemental agreement of 1946 among Madras, Mysore and Hyderabad.

No. 15/2/45-G.G. (A)

SECRETARIAT OF THE GOVERNOR-GENERAL (PUBLIC)

From

Rao Bahadur V. P. Menon, C.I.E.,

Secretary to the Governor General (Public).

To

The Secretary to the Government of Madras,

Public Works Department.

New Delhi 3, the 23rd April 1946.

*Subject :*—Agreement between the Madras, Hyderabad and Mysore Governments on the distribution of the waters of the Tungabhadra River.

Sir,

I am directed to invite a reference to your letter No. 495-D/45-9, dated the 31st January 1946 on the above subject, and to forward a copy of Supplements I and II to the Madras-Mysore and the Madras-Hyderabad Agreements which were agreed to by technical representatives of the three Governments in December last.

2. The following minor verbal changes were proposed by His Exalted Highness the Nizam's Government for incorporation in the Madras-Mysore Agreement, and are understood to have been accepted by the Governments of Madras and Mysore:—(1) In Sub-paragraph 2 of the preamble, the word "near" should be substituted for the word "at" before "Lakkavalli" and the words "or at any other place" should be deleted after "Lakkavalli"; and (2) in sub-paragraph 2 of clause 10 after the words "other party" the words "such as Hyderabad" should be inserted.

3. Attention is also invited to an alteration in clause (2) of the Madras-Mysore Agreement, which is understood to have been proposed by the Government of Madras and accepted by the Mysore Government, *viz.*, the substitution of the word "below" for the word "above" in the phrase reading "river Bhadra above the existing Bhadra anicut".

4. The Government of Bombay and the Sangli Durbar have also been consulted on the terms of the agreement, and their concurrence obtained.

5. I am now to invite the Government of Madras to ratify the agreement and to request that this ratification may kindly be communicated to me at a very early date. His Exalted Highness the Nizam's Government and the Government of Mysore are also being addressed with a view to their ratification being obtained.

I have the honour to be,

Sir,

Your most obedient servant,

Sd/- V. P. MENON,

*Secretary to the Governor General (Public).*

**Supplement—I** (Page 1)

A. Mysore may proceed with the construction of the Sacrabyle anicut on the Tunga river subject to the condition that pending the construction of the Tungabhadra Dam Mysore shall not extract supplies from the Tunga at the Sacrabyle anicut during low flow period when such extraction is likely to adversely affect the existing pre-Moghul irrigation. To ensure that the spirit of this clause is complied with regulation rules in this respect shall be framed by the Chief Engineers of the three Governments.

B. With regard to allowance for the rights of the Government of Mysore to draw off water for factories and towns from the water courses in the Tunga-

bhadra basin or the rights of the riparian land owners to take water to which they may be entitled under the law or for the minor tanks in the Tungabhadra basin, Hyderabad agrees to a specific figure limited to 4,000 M.C. ft. of water.

C. Regarding the quantity of 57,000 M.C. ft. exclusive of evaporation losses at the Lakkavalli Reservoir under clause (i) of the Mysore-Madras Agreement, Hyderabad does not commit herself either way to its acceptance or otherwise and shall be free to act under clause (10) sub-para (2) of that Agreement. Subject to the above, Hyderabad does not object to the construction of the Lakkavalli Reservoir.

D. The extension of irrigation from the existing Bhadra anicut provided for under clause (i) (b) of the Madras-Mysore Agreement, shall be permitted subject to the same condition as laid down for the irrigation from the Sacrabyle Scheme mentioned under (A) above.

E. The Governments of Hyderabad, Madras and Mysore recognise the claims of Sangli, Bombay and any other riparian areas (excluding those of Mysore, Madras and Hyderabad which are already covered by the two Agreements between Madras and Hyderabad and Madras and Mysore) to an equitable share of waters which shall be decided by a tribunal set up by the Government of India for the purpose of final apportionment of the Tungabhadra Waters between all the interested parties; further the three Governments agree that the schemes under the two Agreements, mentioned above are not intended to prejudice in any way the claims of Bombay, Sangli, etc.

F. In clause (2) of Madras-Mysore Agreement substitute "below" for "above" in the sentence "..... ..... river Bhadra above the existing Bhadra anicut. ……."

Sd/- AL1 NAWAZ JUNG

Sd/- A. N. KHOSLA
24-12-45

Sd/- S. M. YOUNUS
24-12-45

Sd/- A. R. VENKATACHARI
26-12-45
Chief Engineer for
Irrigation (Madras).

Sd/- M. NARASIMHA1YA
27-12-45
Chief Engineer for
Irrigation (Mysore).

**Supplement—I** (page 3) Enclosure (i)

OFFICE OF THE CHIEF ENGINEER
(IRRIGATION) MYSORE

Camp : Erode. Dated
27th Dec., 1945

My dear Mr. Khosla,

With reference to the Memorandum of Six clauses jointly signed by Hyderabad, Madras and Mysore Chief Engineers and Technical Advisers, I would like to draw your specific attention to the question of setting up of a Tribunal by the Government of India under Cl. E. with a request that you will please have the point examined by the Political as well as the Legal experts in the Government of India to see that it does not conflict in any way with the provisions of the Government of India Act or the Treaty signed by the States.

At my end I will place this matter before the Dewan Saheb and communicate to you by telegram or express letter, his views if any on the matter.

This D.O. should be considered as an enclosure to the Memorandum referred to above.

Yours sincerely, Sd/- M.
NARASIMHAIYA.

To

Rai Bahadur
A. N. Khosla, ISE,
Consulting Engineer to the Government of India,
W & I, New Delhi. (Camp : Erode).

M. Narasimhaiya,
Chief Engineer for Irrigation.

Bangalore,
Dated 29-12-1945.

**Supplement-I** (Page 4) Enclosure (ii)

SHARING OF THE TUNGABHADRA WATERS

My dear Mr. Khosla,

1 submitted the papers to the Dewan and the Minister for Public Works.

The Dewan sees no personal objection, prima facie, to the proposals now made and awaits communication from the Government of India on receipt of

which the matter will be dealt with as promptly as possible by the Government of Mysore.

With high regards,

Yours sincerely,

Sd/- M. NARASIMHAIYA.

Supplement-II (Page-5)

Regarding the Madras-Hyderabad Agreement the question raised by Mysore in respect of safeguarding her irrigation interest in the Vedavati basin does not concern Hyderabad and should therefore be settled between Madras and Mysore.

Sd. ALI NAWAZ JUNG.

Sd. M. NARASIMHAIYA.
27-12-45
*C.E. for Irrigation, Mysore.*

Sd. A. N. KHOSLA.
24-12-45.

Sd. S. M. YOUNUS
24-12-45

Sd. A. R. VENKATACHARI,
26-12-45
*C.E. for Irrigation, Madras.*

Enclosure to Supplement 1 and II (Page-6)

On the Memorandum of Hyderabad relating to Vedavati, Madras would agree to the following remark provided Mysore agrees too:—

The agreement between Madras and Hyderabad docs not affect the rights of Mysore or Madras in regard to the utilization of the waters of the Vedavati.

On the main Memorandum of six paragraphs A to F it is provisionally agreed to and :—

We agree to the Memorandum subject to the remark that as regards paragraph F of the Memorandum, Madras would agree provided Mysore agrees to let down the water into the river not lower than just below the Bhadra Anicut.

Sd. A. R. VENKATACHARI,
26-12-45
*Chief Engineer, Irrigation, Madras.*

Sd. A. N. KHOSLA,
27-12-45
*Chief Engineer to the Government of India.*

Sd. M. NARASIMHAIYA,
*Chief Engineer for Irrigation, Mysore.* 27-12-45.

Sheet-III (Page 7)

With regard to the technical details for settlement provided under clause (14) of the Madras-Hyderabad Agreement, Hyderabad requests very early action with a view to settlement of these details without which there will be the possibility of delays at different stages of the Project.

Sd. ALI NAWAZ JUNG.

Sd. S. M. YOUNUS
24-12-45

Sd. A. N. KHOSLA
24-12-45

SHEET IV (Page 8)

Hyderabad reiterates her request for the setting up of a tribunal for the final apportionment of the Tungabhadra waters and requests for a very early action in this respect.

Sd. ALI NAWAZ JUNG.

Sd. S. M. YOUNUS.

24-12-45

Sd. A. N. KHOSLA.
24-12-45

## APPENDIX I

### Agreed statement of catchment areas at different points in Krishna basin

| Item No. | Description | Areas in sq. miles | | | As agreed (on 31-3-71) |
|---|---|---|---|---|---|
| | | Maharashtra | Mysore | Andhra Pradesh | |
| 1 | 2 | 3 | 4 | 5 | 6 |
| 1 | The Krishna upto Khodshi weir . . . . . | 1,322 | 1,322 | 1,322 | 1,322 |
| 2 | The Krishna upto Junction with Koyna including the Koyna | 2.081 | 2,062 | 2,141 | 2,081 |
| 3 | The Krishna upto Maharashtra border (m Maharashtra) | 6,939 | 6,581 | 6,939 (Entire K-l) | 6,613 |
| 4 | Thc Krishna from Maharashtra border upto Almatti dam including Ghataprabha (K-2 and K-3 full) & K-l of Mysore . . . . . | 6,164 | 7,290 | 5,459 (excluding K-l of Mysore) | 6,273 |
| 5. | From Almatti dam to Narayanpur dam including the Malaprabha . . . . . | 5,628 | 4,604 | 5,568 | 5,589 |
| 6. | The Krishna from Narayanpur dam upto Mysore border (Part of K-2 sub basin including K-7 of Mysore) | 2,825 | 3,761 | 3,521 | 3,761 |
| 7. | The Krishna from Mysore border to Srisailam (excluding Bhima & Tungabhadra) . . . . . | 4,939 | 2,456 | 4,789 | 4,647 |
| 8. | The Krishna from Srisailam to Nagarjunasagar (Part of K-7) . . . . . | 3,704 | 3,557 | 3,493 | 3,493 |
| 9. | The Krishna from Nagarjunasagar to Vijayawada (Areas of K-10, K-11, K-l2 are according to Krishna-Godavari Commission's report given by all the States) and Part of K-7 . . . . . | 13,879 | 15,522 | 14,044 | 14,044 |
| 10 | The Bhima upto Ujjani dam (Part of K-5) | 5,736 | 5,736 | 5.736 | 5,736 |
| 11. | The Bhima from Ujjani dam upto junction with Nira including the Nira (Part of K-5) . . . . . | 2,808 | 2,524 | 3,074 | 2,941 |
| 12. | The Bhima from the junction with the Nira upto mile 303 i.e. where com non Maharashtra-Mysore border along the river begins (Part K-5) . . . . . | 3,524 | 3,353 | 3,537 | 3,530 |
| 13. | The Bhima from mile 303 to mile 349 (where common Maharashtra-Mysore Border along the liver ends) | 1,664 | 1,823 | 1,663 | 1,664 |
| 14. | The Sina upto Junction with the Bhima (Part K-5) | 4,637 | 4,595 | 4,272 | 4,600 |
| 15. | The Bhima from mile 349 upto Mysore border (excluding Andhra Pradesh area Part K-6) . . . . . | 8,918 (including Andhra Pradesh area in K-6) | 9,233 | 7,736 | 7,821 |
| 16. | The Ghataprabha upto Maharashtra border (Part K-3) . | 416 | 776 | 390 | 400 |
| 17. | The Ghataprabha from Maharashtra border upto junction with the Krishna excluding complete Hiranyakeshi catch ment (Part K-3) . . . . . | 2,993 (including Hiranyakeshi) | 2,633 | 2,695 | 2,633 |
| 18. | The Dudhganga upto Maharashtra border excluding Vedganga in Maharashtra territory . . . . . | 669 (including Vedganga) | 279 | 304 | 290 |
| 19. | The Dudhganga from Maharashtra border upto junction with Krishna (Part K-l) . . . . . | 326 | 133 | 306 | 326 |
| 20 | The Tungabhadra upto Tungabhadra Dam (Part K-8) | 10,880 | 10,880 | 10,880 | 10,880 |

| 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|
| 21. | Tungabhadra from Tungabhadra Dam to Rajolibunda (Part K-8 and entire K-9) . . . . . | 12,837 | 12,837 | 12,837 | 12,837 |
| 22. | Tungabhadra from Rajolibunda to Mysore border (Part K-8) including area in Andhra Pradesh . . . . . | 785 | 872 | 1,238 | 1,238 |
| 23. | The Tungabhadra from Mysore border upto junction with the Krishna (Part K-8 in Andhra Pradesh) . . . . . | 2,192 | 2,985 | 2,619 | 2,619 |
| 24. | Don upto Maharashtra border (Part K-2) . . . . . | 30 | 35 | 52 | 35 |
| 25. | Balance of Don upto its junction with the Krishna (Part K-2) . . . . . | 1,268 | 1,290 | 1,167 | 1,290 |
| 26. | Hiranyakeshi into Maharashtra Border (Part K-3) | 324 | 376 | 300 | 352 |
| 27. | Markandeya upto Maharashtra border (Part K-3) | 36 | 22 | 24 | 24 |
| 28. | Agrani upto Maharashtra border (Part K-2) | 522 | 475 | 380 | 501 |
| 29 | Bori upto Maharashtra border (Part K-6) | 710 | 760 | 705 | 710 |
| 30. | Bemthora upto Maharashtra border (Part K-6) | 330 | 365 | 308 | 330 |
| 31. | Doddahilla (Nargel) upto Maharashtra border (Part K-5) | 340 | 260 | 472 | 357 |
| 32. | Bor upto Maharashtra border (Part K-5) | 340 | 448 | 372 | 340 |
| 33. | Amarja upto Maharashtra border (Part K-6) | 30 | 69 | 99 | 69 |
| 34. | The Kagna upto Mysore border (K-6 in Andhra Pradesh) | 972 | 827 | 1,246 | 972 |
| 35. | Chikka Hagari upto Mysore border (Part K-9) | 1,107 | 1,190 | 798 | 1,150 |
| 36. | Vedavathi Entire Mysore area (K-9) | 6,718 | 7,830 | 7,247 | 7,034 |
| 37. | Unnamed tributary No. 1 (Tributary joining Suvarnamukhi) (K-9 sub basin) | 463 | 500 | 543 | 520 |
| 38. | Unnamed tributary No. 2 (Joining Vedavati below con fluence of Suvarnamukhi) | 176 | 317 | 276 | 296 |
| 39. | Unnamed tributary No. 3 (Joining Vedavati below con-fluence of Chikkahagari) | 71 | 385 | 374 | 380 |
| 40. | Unnamed tributary No. 4 (Joining Tungabhadra below confluence of Vedavati and Tungabhadra) | 308 | 276 | 292 | 292 |
| 41. | The entire catchment area of the Krishna basin in Maha rashtra | 26,805 | 26,805 | 26,805 | 26,805 |
| 42. | The entire catchment area of the Krishna basin in Mysore . | 43,734 | 43,734 | 43,734 | 43,734 |
| 43. | The entire catchment area of the Krishna basin in Andhra Pradesh upto Vijayawada | 28,407 | 29,441 (upto sea) | 28,719 | 28,719 |
| | Total area in Krishna basin upto Vijayawada . | 98,946 | 99,980 (upto sea) | 99,258 | 99,258 |
| 44. | Catchment area of Krishna below Vijayawada and upto sea | 1,034 | 722 | 722 | 722 |

Sd/-
K. M.SEERVAI
*for* the State of Maharashtra
7-5-1971

Sd/-
P. RAMACHANDRA REDDI
*for* Andhra Pradesh 7-5-1971

Sd/-
T. KRISHNA RAO
*for* the State of Mysore
7-5-1971

## APPENDIX J

Having regard to the fact that there is no available data relating to underground water which the parties can place before this Honourable Tribunal for the purpose of deciding the present dispute, the parties state, for the purpose of this dispute, as follows :—

1. The underground water resources of the States concerned will not be regarded as alternative means of satisfying their needs and will not be taken into account for purposes of the equitable apportionment of the waters of the river Krishna and the physical basin (river-valley) thereof.

2. The States do not ask the Tribunal to put any restrictions on the use of underground water by the States.

| | | |
|---|---|---|
| Sd/- | Sd/- | Sd/- |
| P. RAMACHANDRA REDDI, | T. KRISHNA RAO, | H. M. SEERVAI, |
| *for* Andhra Pradesh. | *for* Mysore State. | *for* Maharashtra. |
| 1-4-1971 | 1-4-1971 | 1-4-1971 |

## APPENDIX K

### Supplementary agreement

I. With reference to Annexure 'A' to the Order of the 1st April, 1971, the States of Andhra Pradesh, Maharashtra and Mysore are agreed that for clause 2 of the said Annexure 'A' the following clauses 2 and 3 be substituted:

"2. The States will be free to make use of underground water within their respective State territories.

3. This agreement will not be taken in any way to alter the rights, if any, under the law for the time being in force, of private individuals, bodies or authorities."

Sd/-
T. KRISHNA RAO
Counsel
for the State of Mysore
25-9-1972

Sd/-
P. RAMACHANDRA REDDI
Advocate General
*for* the State of Andhra Pradesh
25-9-1972

Sd/-
H. M. SEERVAI
Advocate General
*for* the State of Maharashtra
25-9-1972



3 I&P/73—5.

## APPENDIX L

The States of Maharashtra, Mysore and Andhra Pradesh agree as follows:—

The uses mentioned in column No. 1 below shall be measured in the manner indicated in column No. 2:—

| Use | Measurement |
|---|---|
| Domestic and municipal water supply. | By 20 per cent of the quantity of water diverted or lifted from the river or any of its tributaries or from any reservoir, storage or canal. |
| Industrial use | By 2.5 per cent of the quantity of water diverted or lifted from the river or any of its tributaries or from any reservoir, storage or canal. |

Sd/-
**E. C. SALDANHA**
20-8-73
Maharashtra

Sd/-
**S. G. BALEKUNDRY**
20-8-73
Mysore

Sd/-
**G. K. S. IYENGAR**
20-8-73
Andhra Pradesh

Sd/-
**T. R. ANDHYARUJINA**
Counsel
*for* State of Maharashtra
20-8-73

Sd/-
**T. KRISHNA RAO**
*for* State of Mysore
20-8-73

Sd/-
**P. RAMACHANDRA REDDI**
*for* the State of Andhra Pradesh
20-8-73

## APPENDIX M

### Agreement between the State of Mysore and the State of Andhra Pradesh regarding protection to irrigation works in their respective Territories in Vedavathy Sub-Basin

It is agreed between the State of Mysore and the State of Andhra Pradesh that the State of Mysore will not put up any new work on the streams mentioned in Schedule (1) within the limits shown in the said Schedule and marked in the map* appended herewith, without the previous consent of Andhra Pradesh to protect the irrigation interests under the existing irrigation works in Andhra Pradesh and similarly it is agreed that the State of Andhra Pradesh will not put up any new work on the streams mentioned in Schedule (2) within the limits shown in the said Schedule and marked in the map* appended herewith, without the previous consent of Mysore State to protect the irrigation interests under the existing irrigation works in Mysore State.

It is further agreed between the State of Mysore and the State of Andhra Pradesh that the State of Mysore will not put up any new construction on Suvarnamukhi river so as to affect the supply of Agali tank in Andhra Pradesh for the irrigation of an ayacut of 884 acres, the supplies for which are drawn from the Agali Anicut in Mysore State.

Having regard to this concession the parties are agreed that the Tribunal need not decide issue No. IV.

Sd/-
**T. KRISHNA RAO**
Counsel
*for* the State of Mysore
2-9-71

Sd/-
**P. RAMACHANDRA REDDI**
Counsel
*for* the State of Andhra Pradesh
2-9-71

*See Map II in Volume IV of the Report.

**SCHEDULE 1**

**List of streams on which no new constructions should be undertaken by the State of Mysore without the previous concent of Andhra Pradesh**

| Sl. No. | Name of the Stream or Catchment | Location in the Map | Limits within which no new construction should be undertaken by Mysore without the previous consent of Andhra Pradesh |
|---|---|---|---|
| 1 | 2 | 3 | 4 |
| 1. | Hagari (Vedavathy) . . . . . | A | From Vanivilas Sagar in Mysore upto Bhairavanithi-ppa Dam in Andhra Pradesh. |
| 2. | Dodderi tank halla (Garanihalla) . . . . | B | 4 ½ mites up-stream of confluence with Hagari. |
| 3. | Talak tank halla (Garanihalla) . . . . | C | From the Salem-Bellary road bridge over this stream upto confluence with Hagari. |
| 4. | Chinnahagari . . . . . | D | Upto 16 miles upstream from Mysore-Andhra Pradesh boundary. |
| 5. | Amarapuram tank catchment . . . . | E | Catchment of Amarapuram tank in Mysore State. |
| 6. | Virapasamudram tank catchment . . . . | F | Catchment of Virapasamudram tank in Mysore State. |
| 7. | Yeradkere tank catchment . . . . | G | Catchment of Yeradkere tank in Mysore State. |
| 8. | Rangasamudram tank catchment . . . . | H | Catchment of Rangasamudram tank in Mysore State. |
| 9. | Nagalapuram tank catchment . . . . | 1 | Catchment of Nagalapuram tank in Mysore State. |

Sd/-
T. KRISHNA RAO
Counsel
*for* the State of Mysore
2-9-71

Sd/-
P. RAMACHANDRA REDDI
Counsel
*for* the State of Andhra Pradesh
2-9-71

**SCHEDULE 2**

**List of streams on which no new constructions should be undertaken by the state of Andhra Pradesh without the previous consent of Mysore**

| Sl No | Name of the Stream | Location in the map | Limits within which no new construction should be undertaken by Andhra Pradesh without the previous consent of Mysore State |
|---|---|---|---|
| 1 | 2 | 3 | 4 |
| 1 | Madalur Doddakere nale . . . . . | J | Entire catchment of the nala in Andhra Pradesh |
| 2 | Madalur Gidaganahalli Kattenala . . . . . | K | Entire catchment of the nala in Andhra Pradesh |
| 3 | Doddabanagere Doddakere nala . . . . . | L | Entire catchment of the nala in Andhra Pradesh |
| 4. | Dharmapur tank nala . . . . . | M | Entire catchment of the nala in Andhra Pradesh |
| 5. | Parasurampur Doddakere nala . . . . . | N | Entire catchment of the nala in Andhra Pradesh |
| 6 | Kadehoda Achuvalikere nala . . . . . | 0 | Entire catchment of the nala in Andhra Pradesh |
| 7 | Parasurampura tank nala . . . . . | P | Entire catchment of the nala in Andhra Pradesh |
| 8 | Gowripura Palayadakere nala . . . . . | Q | Entire catchment of the nala in Andhra Pradesh |
| 9 | Jajur tank nala . . . . . | R | Entire catchment of the nala in Andhra Pradesh |
| 10 | Thippareddihally Kyatanakere nala . . . . | S | Entire catchment of the nala in Andhra Pradesh |
| 11 | Oblapur tank nala . . . . . | T | Entire catchment of the nala in Andhra Pradesh |
| 12 | Hagari (Vedavathi) . . . . . | U | Below Bhairavanithippa Dam up to Andhra Pradesh Mysore border |
| 13 | Chinnahagari . . . . . | V | From Mysore-Andhra Pradesh border upto its confluence with Vedavathy (Hagari) |

Sd/
T. KRISHNA RAO
Counsel
*for* the State of Mysore
2-9-71

Sd/-
P RAMACHANDRA REDDI
Counsel
*for* the State of Andhra Pradesh
2-9-71

## APPENDIX N

### Supplementary Agreement regarding Gauging Sites in the Krishna River System

The Engineers for the States of Maharashtra, Mysore and Andhra Pradesh agree that the river Krishna and its tributaries should be gauged at the following sites :

**I. At all the dam & weir sites—existing, under construction and future projects—utilising annually 1 T.M.C. or more :—**

At all such sites the following measurements will be made and recorded three times a day—6 A.M. in the morning, 12 Noon and 6 P.M. in the evening.

(a) Diversions into canals, penstocks, tunnels etc.

(b) Water let down through the various sluices in the dam, weir or barrage.

(c) Overflow over waste weir or spillways.

(d) Estimated evaporation losses.

(e) Water lifted from the river or reservoirs for irrigation, water supply and for any other purpose. These measurements will be made by the States in which the dams & weirs are situated.

The cost of such measurements will be borne by the States concerned.

**II. Gauging on Inter-State Streams:—**

Three times daily at 6 A.M., 12 Noon and 6 P.M.

A. *Inter-State streams between Mysore and Andhra Pradesh :*

| | |
|---|---|
| 1. The Krishna River near | Deosugar (at present a CW&PC gauging site). |
| 2. The Bhima River near . | Yadgir (CW&PC gauging site). |
| 3 The Tungabhadra River near | Madhwaram bridge site. |
| 4. (a) The Vedavathi River near | Bhairavanithippa. |
| (b) The Vedavathi River near | Rampur (at present a CW&PC site). |
| 5. The Kagna river near | Jiwargi. |
| 6. The Chikkahagari river near | Amkundi Bridge or Aqueduct site on High Level Canal. |

The location of these stations may be changed from time to time as the river channels and flow conditions of the river channels and flow conditions of the rivers may require. The river gauging at Deosugar, Yadgir, and Rampur. will be continued to be done by the CW&PC as at present the State bearing the cost as being done now. The river gauging at Madhawaram, Bhairavanithippa, Jiwargi and Amkundi Bridge will be done jointly by the States of Mysore and Andhra Prasdesh or by the CW&PC if willing to do so, and the cost will be shared between all the three States equally.

B. *Inter-State Streams between Maharashtra and Mysore :*

| | |
|---|---|
| 1. The Krishna river near | Shirti (at present a CW&PC guaging site). |
| 2. The Bhima river near | Takali (-do-) |
| 3. The Ghataprabha river near | Daddi. |
| 4. The Vedganga river near | Bastawad. |
| 5. The Dudhganga river near | Kagal at the bridge site on N. Highway. |
| 6. The Panchaganga river near | Terwad (at present a CW&PC gauging site). |
| 7. The Agrani river near | Pendagaon. |
| 8. The Hiranyakeshi river near | Gotur weir. |
| 9. The Bornala river near . | Konkangaon. |
| 10. The Borinala near . | Diksanga site or Railway bridge near Rudewadi. |
| 11. The Doddahalla river near | Shivadhan. |
| 12. The Benithora river near | Diggi. |

The location of the said stations may be changed from time to time as the river channels and water flow conditions of the rivers may require.

The river gauging at Shirti, Takali and Terward will be continued to be done by the CW&PC as at present the States bearing the cost as being done now. The river gauging at Daddi, Bastaward, Kagal, Pendagaon, Gotur, Konkangaon, Diksanga or Rudewadi, Shiradhan, and Diggi will be done jointly by the states of Maharashtra and Mysore or the CW&PC if willing to do so, and the cost of gauging at these sites will be shared between all the three States equally.

C. *C.W. & P.C. gauging sites.*

In addition to the CW&PC gauging sites mentioned in A & B above, the CW&PC will continue to do the river gauging as at present at the following sites the cost being borne by the three States as at present.

(a) *On the Krishna river at*

(1) Karad (in Maharashtra)

(2) Almatti (in Mysore)

(3) Dhannur (in Mysore)

(4) Yaparla (in Andhra Pradesh)

(5) Moravakonda (in Andhra Pradesh)

(6) Srisailam (in Andhra Pradesh)

(7) Damerapadu (in Andhra Pradesh)

(8) Wadenpalli (in Andhra Pradesh)

(9) Vijayawada (in Andhra Pradesh)

(b) *on the Koyna river at*

(10) Koyna dam (Maharashtra)

(11) Warunji (Maharashtra)

(c) *on the Warna river at*

(12) Samdoli (Maharashtra)

(d) *on the Dudhganga river at*

(13) Sadalgi (Maharashtra)

(e) *on the Ghataprabha river at*

(14) Dhupdal weir (in Mysore)

(15) Bagalkot (in Mysore)

(f) *on the Malaprabha river at*

(16) Huvanur (in Mysore)

(g) *on the Bhima river at*

(17) Dhond (in Maharashtra)

(18) Narsingpur (in Maharashtra)

(h) *on the Nira river at*

(19) Sarati (in Maharashtra)

(i) *on the Sina river at*

(20) Wadakbal (in Maharashtra)

(j) *on the Tungabhadra river at*

(21) Harlahalli (in Mysore)

(22) Manuru (in Mysore)

(23) Mantralyam (in Mysore)

(24) Bawapuram (in Andhra Pradesh)

(k) *on the Tunga river at*

(25) Shimoga (in Mysore)

(1) *on the Bhadra river at*

(26) Lakhavali (in Mysore)

(m) *on the Varada river at*

(27) Marol (in Mysore)

(n) *on the Musi river at*

(28) Damercherla (in Andhra Pradesh)

(o) *on the Pattern river at*

(29) Palleru bridge (in Andhra Pradesh)

(p) *on the Munneru river at*

(30) Keesra (in Andhra Pradesh)

Sd/-
E C. SALDANHA
20.8.73

Sd/-
S. G. BALEKUNDRY
20.8.73
(Mysore)

Sd/-
G. K. S. IYENGAR
20.8.73
(Andhra Pradesh)

Sd/-
T.R. ANDHYARUJINA
Counsel
for State of Maharashtra
20.8.73

Sd/-
T. KRISHNA RAO
for the State of Mysore
20.8.73

Sd/-
P. RAMACHANDRA REDDI
for the State of Andhra Pradesh
20.8.73

## APPENDIX O

## MAHARASHTRA "X"

### Annual flow series at Vijayawada for the years 1894- 95 to 1971-72 filed by the State of Maharashtra

The parties requested the Tribunal that for the purposes of allocation of water the 75 per cent dependable flow of Krishna river upto Vijayawada be determined at this stage. With the able assistance of Counsel for the parties and after thorough examination of all the material on record and after careful consideration of the matter, the Tribunal directed that the flow series from 1894-95 to 1971-72 be prepared on the following lines : —

(1) The Tribunal has come to the conclusion that for 1901-02 to 1950-51 the flows should be deemed to be modular on all the days except 116 days (vide pages 170 to 173 of C.W. & P.C. K-5).

(2) The Tribunal is of the opinion that for the years 1929-30 to 1950-51 for which there is complete flow data the flows be calculated by applying the following equations as given in MRK-334 filed on 10-4-1973.

(a) $Q = C_1 L[(H+h_a)^{3/2} - h_a^{3/2}]$ -------- (1)

(b) $Q = 3.1\ L\ [(h+h_a)3/2 - h_a 3/2] + CLD\sqrt{2g(h+h_a)}$
for non-modular flows …… (2)
with the coefficient C1 as determined.
by the Tribunal.

and (c) $Q = 3.33Lx\left[ (h_1+h_a)^{3/2} - h_a^{3/2} \right]$ (3)

where h1 is the depth of flow over the top of standing shutters for flows over the standing shutters. In equation (2) above values of coefficients C for different values of 'd' are taken as given MRK-334. (3) The coefficients $\mathbf{C_1}$ as in equations 1, 2 and 3 in p. 2 above as determined by the Tribunal be adopted as under :

| | |
|---|---|
| 0' to 3' . . . . . | 2.60 |
| 3' to 6' . . . . . | 2.75 |
| 6' to 9' . . . . . | 3.00 |
| 9' to 11' . . . . . | 3.10 |
| above 11' . . . . . | 3.20 |

(4) The Tribunal accepts the contention of the State of Maharashtra in MR Note 1 that for the years 1925-26 to 1928-29 the flows be taken in the manner set forth in that note.

(5) The Tribunal accepts the contention of Andhra Pradesh in para 9 of AP Note 10 that for the years 1901-02 to 1924-25 the flows be calculated as set forth in that note.

(6) The Tribunal accepts the contention of Maharashtra as set forth in MR Note 2 that for the years 1951-52 to 1970-71 and in MR Note No. for the year 1971-72, the flows should be taken as set forth in those notes.

(7) The Tribunal is of the opinion that for the years 1894-95 to 1900-1901 the recorded flows as mentioned in the Krishna Reservior Project Report (Exh. APK 403) should be adopted.

(8) So far as the upstream utilisations are concerned, for the period 1894-95 to 1900-1901, in the absence of data or agreed figures the same utilisations as for the year 1901-1902 be adopted. So far as the utilisations for the years 1901-1902 to 1955-56 are concerned, the utilisations as agreed to between the States be adopted (vide Tribunal's order dated 7th May 1972.)

(9) For the years 1956-57 to 1968-69, the figures of upstream utilisations as agreed to by the States of Maharashtra and Mysore and as given in Maharashtra chart MRA-15 in MR Note 2 have been adopted. The figures of upstream utilisations according to the contention of A.P. for these years are given in brackets.

(10) As the data of utilisations for the years 1969-70 to 1971-72 are not before the Tribunal, the same figures of utilisations as for the year 1968-69 be taken for these years disregarding higher utilisations, if any. The runoff series for 1894-95 to 1971-72 is annexed hereto as annexure I. Based on the above series the 75 per cent dependable flow comes to 2060 T.M.C. This series may be adopted for the purposes of this case, and the 75 per cent dependable flow may be held to be 2060 T.M.C.

Sd/-
H. M. SEERVAI
*for* the State of
Maharashtra
4-5-1973

**ANNEXURE-I**

**Run-off series of Gross yields of Krishna at Vijayawada for the period 1894-95 to 1971-72**

| Sl. No | Year | Flow over anicut inclusive of flow through sluices | Up-stream uses | Gross yield | Yields arranged in descending order | | Dependability |
|---|---|---|---|---|---|---|---|
| | | | | | Year | Gross yield | |
| | | TMC | TMC | TMC | | TMC | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| 1 | 1894-95 | 1838.55 | 245.71 | 2084 | 1956-57 | 4166 (4165) | |
| 2 | 1895-96 | 1937.00 | 245.71 | 2183 | 1961-62 | 3760 (3755) | |
| 3 | 1896-97 | 2365.4 | 245.71 | 2611 | 1916-17 | 3721 | |
| 4 | 1897-98 | 2449.52 | 245.71 | 2695 | 1959-60 | 3482 (3477) | |
| 5 | 1898-99 | 2342.02 | 245.71 | 2588 | 1964-65 | 3397 (3385) | |
| 6 | 1899-1900 | 879.03 | 245.71 | 1125 | 1903-04 | 3160 | |
| 7 | 1900-01 | 2549.51 | 245.71 | 2795 | 1958-59 | 3116 (3113) | |
| 8 | 1901 02 | 1811.60 | 245.71 | 2057 | 1962-63 | 3079 (3075) | |
| 9 | 1902-03 | 1623.40 | 245.71 | 1869 | 1960-61 | 3069 (3060) | |
| 10 | 1903-04 | 2914.50 | 245.71 | 3160 | 1914-15 | 3049 | |
| 11 | 1904-05 | 1524.30 | 245.71 | 1770 | 1917-18 | 3029 | |
| 12 | 1905-06 | 1026.00 | 246.71 | 1273 | 1955-56 | 2969 | |
| 13 | 1906-07 | 1641.40 | 248.71 | 1890 | 1933-34 | 2936 | |
| 14 | 1907-08 | 2026.40 | 249.71 | 2276 | 1953-54 | 2919 | |
| 15 | 1908-09 | 2222.20 | 249.71 | 2472 | 1931-32 | 2903 | |
| 16 | 1909-10 | 1893.00 | 250.71 | 2144 | 1946-47 | 2840 | |
| 17 | 1910-11 | 2171.0 | 250.71 | 2422 | 1900-01 | 2795 | |
| 18 | 1911-12 | 1199.70 | 251.71 | 1451 | 1963-64 | 2757 (2751) | |
| 19 | 1912-13 | 1712.90 | 251.71 | 1965 | 1970-71 (1957-58) | 2745 (2730) | |
| 20 | 1913-14 | 1556.50 | 251.71 | 1808 | 1957-58 (1970-71) | 2732 (2725) | |
| 21 | 1914-15 | 2786.40 | 262.71 | 3049 | 1932-33 | 2703 | |
| 22 | 1915-16 | 2120.80 | 252.71 | 2374 | 1897-98 | 2695 | |
| 23 | 1916-17 | 3468.30 | 252.71 | 3721 | 1969-70 | 2685 (2665) | |
| 24 | 191718 | 2775.90 | 252.71 | 3029 | 1950-51 | 2629 | |
| 25 | 1918-19 | 746.10 | 260.71 | 1007 | 1938-39 | 2613 | |
| 26 | 1919-20 | 2009.70 | 260.71 | 2270 | 1896-97 | 2611 | |



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| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|
| 27. | 1920-21 . . . . . | 1429.70 | 260.71 | 1690 | 1898-99 | 2588 | |
| 28. | 1921-22 . . . . . | 1903.60 | 260.71 | 2164 | 1949-50 | 2544 | |
| 29. | 1922-23 . . . . . | 1791.40 | 271.71 | 2063 | 1967-68<br>(1947-48) | 2538<br>(2525) | |
| 30. | 1923-24 . . . . . | 2199.70 | 271.71 | 2471 | 1947-48<br>(1967-68) | 2525<br>(2519) | |
| 31. | 1924-25 . . . . . | 2052.20 | 271.71 | 2324 | 1908-09 | 2472 | |
| 32. | 1925-26 . . . . . | 2014.80 | 265.93 | 2281 | 1923-24 | 2471 | |
| 33. | 1926-27 . . . . . | 1910.74 | 266.29 | 2177 | 1954-55 | 2439 | |
| 34. | 1927-28 . . . . . | 2028.29 | 276.94 | 2305 | 1910-11 | 2422 | |
| 35. | 1928-29 . . . . . | 1935.16 | 276.86 | 2212 | 1915-16 | 2383 | |
| 36. | 1929-30 . . . . . | 1615.42 | 302.44 | 1918 | 1943-44 | 2332 | |
| 37. | 1930-31 . . . . . | 1889.68 | 306.45 | 2196 | 1924-25 | 2324 | |
| 38. | 1931-32 . . . . . | 2593.43 | 309.45 | 2903 | 1948-49 | 2311 | |
| 39. | 1932-33 . . . . . | 2390.71 | 312.42 | 2703 | 1927-28 | 2305 | |
| 40. | 1933-34 . . . . . | 2620.96 | 315.41 | 2936 | 1940-41 | 2287 | |
| 41. | 1934-35 . . . . . | 1766.21 | 318.39 | 2085 | 1925-26 | 2281 | |
| 42. | 1935-36 . . . . . | 1605.56 | 321.36 | 1927 | 1907-08 | 2276 | |
| 43. | 1936-37 . . . . . | 1666.27 | 324.03 | 1990 | 1919-20<br>1928-29 | 2270<br>2212 | |
| 44. | 1937-38 . . . . . | 1718.19 | 327.25 | 2045 | 1930-31 | 2196 | |
| 45. | 1938-39 . . . . . | 2284.83 | 327.83 | 2613 | 1939-40 | 2194 | |
| 46. | 1939-40 . . . . . | 1865.41 | 328.41 | 2194 | 1895-96 | 2177 | |
| 47. | 1940-41 . . . . . | 1957.86 | 328.73 | 2287 | 1926-27 | 2177 | |
| 48. | 1941-42 . . . . . | 1358.64 | 356.20 | 1715 | 1942-43 | 2169 | |
| 49. | 1942-43 . . . . . | 1833.87 | 335.30 | 2169 | 1921-22 | 2164 | |
| 50. | 1943-44 . . . . . | 1982.69 | 350.55 | 2332 | 1971-72<br>(1909-10) | 2157<br>.(2144) | |
| 51. | 1944-45 . . . . . | 1790.60 | 338.64 | 2129 | 1909-10<br>(1971-72) | 2144<br>(2137) | |
| 52. | 1945-46 . . . . . | 1628.60 | 331.88 | 1960 | 1968-69<br>(1944-45) | 2136<br>(2129) | |
| 53. | 1946-47 . . . . . | 2500.40 | 339.78 | 2840 | 1944-45<br>(1968-69) | 2129<br>(2116) | |
| 54. | 1947-48 . . . . . | 2196.40 | 329.06 | 2525 | | | |
| 55. | 1948-49 . . . . . | 1988.63 | 322.67 | 2311 | 1934-35 | 2085 | |
| 56. | 1949-50 . . . . . | 2234.30 | 310.08 | 2544 | 1894-95 | 2084 | |
| 57. | 1950-51. . . . . | 2326.63 | 301.85 | 2628 | 1965-66 | 2074<br>(2063) | |
| 58. | 1951-52 . . . . . | 1583.00 | 387 | 1970 | 1922-23 | 2063 | 75 % dep. |
| 59. | 1952-53. . . . . | 1367.00 | 382 | 1749 | 1901-02 | 2057<br>2060 | 2060 |
| 60. | 1953-54 . . . . . | 2499.00 | 420 | 2919 | 1937-38 | 2045 | |
| 61. | 1954-55 . . . . . | 2023.00 | 416 | 2439 | 1936-37 | 1991 | |
| 62. | 1955-56 . . . . . | 2548.00 | 421 | 2969 | 1951-52 | 1970 | |
| 63. | 1956-57 . . . . . | 3726.00 | 440<br>(439) | 4166<br>(4165) | 1912-13 | 1965 | |
| 64. | 1957-58 . . . . . | 2265.00 | 467<br>(465) | 2732<br>(2730) | 1945-46 | 1960 | |

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|
| 65. | 1958-59 . . . . . | 2626.00 | 490<br>(487) | 3116<br>(3113) | 1966-67 | 1957<br>(1939) | |
| 66. | 1959-60 . . . . . | 2969.00 | 513<br>(508) | 3482<br>(3477) | 1935-36 | 1927 | |
| 67. | 1960-61 . . . . . | 2528.00 | 541<br>(532) | 3069<br>(3060) | 1929-30 | 1918 | |
| 68. | 1961-62 . . . . . | 3168.00 | 592<br>(587) | 3760<br>(3755) | 1906-07 | 1890 | |
| 69. | 1962-63 . . . . . | 2481.00 | 598<br>(594) | 3079<br>(3075) | 1902-03 | 1869 | |
| 70. | 1963-64 . . . . . | 2099.00 | 658<br>(652) | 2757<br>(2751) | 1913-14 | 1808 | |
| 71. | 1964-65 . . . . . | 2736.00 | 661<br>(653) | 3397<br>(3389) | 1904-05 | 1770 | |
| 72. | 1965-66 . . . . . | 1378.00 | 696<br>(685) | 2074<br>(2063) | 1952-53 | 1749 | |
| 73. | 1966-67 . . . . . | 1181.00 | 776<br>(758) | 1957<br>(1939) | 1941-42 | 1715 | |
| 74. | 1967-68 . . . . . | 1621.00 | 917<br>(898) | 2538<br>(2519) | 1920-21 | 1690 | |
| 75. | 1968-69 . . . . . | 1140.00 | 996<br>(976) | 2136<br>(2116) | 1911-12 | 1451 | |
| 76. | 1969-70 . . . . . | 1689.00 | 996<br>(976) | 2685<br>(2665) | 1905-06 | 1273 | |
| 77. | 1970-71 . . . . . | 1749.00 | 996<br>(976) | 2745<br>(2725) | 1899-1900 | 1125 | |
| 78. | 1971-72 . . . . . | 1161.03 | 996<br>(976) | 2157<br>(2137) | 1918-19 | 1007 | |
| | | | TOTAL : | 186622<br>(186451) | | | |

(i) Average as per Maharashtra & Mysore figures : . 2393 T.M.C.
(ii) Average as per Andhra Pradesh figures : . 2390 T.M.C.

NOTE : Figures in Brackets arc with upstream utilisations according to Andhra Pradesh.

## APPENDIX P

MYSORE "Y"

### Annual flow series at Vijayawada for the years 1894-95 to 1971-72 filed by the State of Mysore

Parties requested the Tribunal that for purposes of allocation the dependable flow of Krishna river at Vijayawada be determined at 75 per cent dependability With the able assistance of the Counsels for all the parties and after thorough examination of all material on record and after careful consideration of all the aspects of the matter the Tribunal directed that a flow series from 1894 to 1972 be prepared on the following lines :

(1) The Tribunal has come to the conclusion that for the years 1901-02 to 1950-51 flows to be deemed as modular for all days except 116 days as mentioned in C.W. & P.C. (K)-Vol. 19. P. 73 to 79.

(2) The Tribunal is of the opinion that for years 1925-26 to 1950-51 flows over the weir be calculated as per following equation :

$$Q = C_1 L \left[ (H + ha)^{3/2} - ha^{3/2} \right]$$

(H = Head of flow over the anicut)

Non-Modular flow formula

$$Q = 3\ 1L \left[ (h + ha)^{3/2} - ha^{3/2} \right] + 8CLD\sqrt{h + ha}$$

(h = difference between the upstream and downstream levels) with the coefficients as given by the Tribunal and formula $Q = 3\ 33\ L \left[ (h_1 + ha)^{3/2} - ha^{3/2} \right]$ for flow over the standing shutters

($h_1$ = head of flow over the top of shutter)

Modular flow formula

(3) The Tribunal accepts the contention of Maharashtra in Note No. 1 that for years 1925-26 to 1929-30 the flow may be taken in the manner set forth in that note.

(4) The Tribunal accepts the contention of Andhra Pradesh in A.P. Note No. 10 (filed on 3-5-1973), para 9, that for the years 1901-02 to 1924-25 the flows to be calculated as per para 9.

(5) The Tribunal accepts the contention of Maharashtra and Mysore that for the years 1951-52 to 1971-72 the flows as per recorded data may be adopted.

(6) The Tribunal is of the opinion that for the years 1894 to 1901 the recorded flows as mentioned in Krishna Reservoir Project Vol. II may be adopted.

(7) So far as upstream utilisations are concerned, Tribunal is of the opinion that the following shall be adopted :

(i) 1894 to 1901—same as for the year 1901-02 ;

(ii) 1901-02 to 1955-56—as per the agreed statement;

(iii) 1956-57 to 1968-69—figures given both by Andhra Pradesh on the one hand and Maharashtra and Mysore on the other should both be taken ;

(iv) 1969-70 to 1971-72 may be assumed as for the previous year 1968-69 as further details are not on record.

The parties are agreed that the series may be adopted for the purpose of estimating of yields in the present case. The parties submit/agree that the annual flow at Vijayawada including upstream utilisations as given in the series from 1894-95 to 1971-72 and the resultant 75 per cent dependable flow of 2060 T.M.C. may be adopted as a basis for the present allocations.

Sd/-
T. KRISHNA RAO
*for* the State of Mysore
4-5-1973

**Yield Series of the River Krishna at Vijayawada Anicut for the Period 1894-95 to 1971-72**

| SI. No. | Year | Flow at Vijayawada | Upstream uses | Gross yield at Vijayawada | Gross yield arranged in the descending order | |
|---|---|---|---|---|---|---|
| 1. | 2 | 3 | 4 | 5 | 6 | 7 |
| 1. | 1894-95 | 1839 | 245 | 2084 | 1956-57 | 4166 |
| 2. | 1895-96 | 1937 | 245 | 2182 | 1961-62 | 3760 |
| 3. | 1896-97 | 2366 | 245 | 2611 | 1916-17 | 3722 |
| 4. | 1897-98 | 2450 | 245 | 2695 | 1959-60 | 3482 |
| 5. | 1898-99 | 2342 | 245 | 2587 | 1964-65 | 3397 |
| 6. | 1899-1900 | 879 | 245 | 1124 | 1903-04 | 3160 |
| 7. | 1900-01 | 2550 | 245 | 2795 | 1958-59 | 3116 |
| 8. | 1901-02 | 1812 | 245 | 2057 | 1962-63 | 3079 |
| 9. | 1902-03 | 1623 | 245 | 1868 | 1960-61 | 3069 |
| 10. | 1903-04 | 2915 | 245 | 3160 | 1914-15 | 3048 |
| 11. | 1904-05 | 1525 | 245 | 1770 | 1917-18 | 3029 |
| 12. | 1905-06 | 1026 | 246 | 1272 | 1955-56 | 2969 |
| 13. | 1906-07 | 1642 | 249 | 1891 | 1933-34 | 2936 |
| 14. | 1907-08 | 2027 | 250 | 2277 | 1953-54 | 2919 |
| 15. | 1908-09 | 1922 | 250 | 2472 | 1931-32 | 2903 |
| 16. | 1909-10 | 1893 | 251 | 2144 | 1946-47 | 2840 |
| 17. | 1910-11 | 2171 | 251 | 2422 | 1900-01 | 2795 |
| 18. | 1911-12 | 1200 | 251 | 1451 | 1963-64 | 2757 |
| 19. | 1912-13 | 1713 | 252 | 1965 | 1970-71 | 2745 |
| 20. | 1913-14 | 1556 | 252 | 1808 | 1957-58 | 2732 |
| 21. | 1914-15 | 2786 | 262 | 3048 | 1932-33 | 2703 |
| 22. | 1915-16 | 2121 | 253 | 2374 | 1897-98 | 2695 |
| 23. | 1916-17 | 3469 | 253 | 3722 | 1969-70 | 2685 |
| 24. | 1917-18 | 2776 | 253 | 3029 | 1950-51 | 2628 |
| 25. | 1918-19 | 748 | 261 | 1009 | 1938-39 | 2613 |
| 26. | 1919-20 | 2009 | 261 | 2270 | 1896-97 | 2611 |
| 27. | 1920-21 | 1429 | 261 | 1690 | 1898-99 | 2587 |
| 28. | 1921-22 | 1903 | 261 | 2164 | 1949-50 | 2544 |
| 29. | 1922-23 | 1792 | 271 | 2063 | 1967-68 | 2538 |
| 30. | 1923-24 | 1200 | 271 | 2471 | 1947-48 | 2525 |
| 31. | 1921-25 | 2052 | 272 | 2324 | 1908-09 | 2472 |
| 32. | 1925-26 | 2009 | 272 | 2281 | 1923-24 | 2471 |
| 33. | 1926-27 | 1905 | 272 | 2177 | 1954-55 | 2439 |
| 34. | 1927-28 | 2022 | 283 | 2305 | 1910-11 | 2422 |
| 35. | 1928-29 | 1929 | 283 | 2212 | 1915-16 | 2374 |

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| 36 | 1929-30 . . . . . | 1610 | 308 | 1918 | 1943-44 | 2333 |
| 37 | 1930-31 . . . . . | 1884 | 312 | 2196 | 1924-25 | 2324 |
| 38 | 1931-32 . . . . . | 2588 | 315 | 2903 | 1948 49 | 2311 |
| 39 | 1932-33 . . . . . | 2385 | 318 | 2703 | 1927-28 | 2305 |
| 40 | 1933 34 . . . . . | 2615 | 321 | 2936 | 1940-41 | 2287 |
| 41 | 1934-35 . . . . . | 1761 | 324 | 2085 | 1925-26 | 2281 |
| 42 | 1935-36 . . . . . | 1600 | 327 | 1927 | 1907-08 | 2277 |
| 43 | 1936 37 . . . . . | 1660 | 330 | 1990 | 1919-20 | 2270 |
| 44 | 1937-38 . . . . . | 1715 | 330 | 2045 | 1971-72 | 2231 |
| 45 | 1938-19 . . . . . | 2280 | 333 | 2613 | 1928-29 | 2212 |
| 46 | 1939-40 . . . . . | 1860 | 334 | 2194 | 1930-31 | 2196 |
| 47 | 1940-41 . . . . . | 1953 | 334 | 2287 | 1939-40 | 2194 |
| 48 | 1941-42 . . . . . | 1353 | 362 | 1715 | 1895-96 | 2182 |
| 49 | 1942 43 . . . . . | 1828 | 341 | 2169 | 1926-27 | 2177 |
| 50 | 1941 44 . . . . . | 1977 | 356 | 2333 | 1942-43 | 2169 |
| 51 | 1944-45 . . . . . | 1785 | 344 | 2129 | 1921-22 | 2164 |
| 52 | 1945-46 . . . . . | 1612 | 348 | 1960 | 1909-10 | 2144 |
| 53 | 1946-47 . . . . . | 2494 | 346 | 2840 | 1968-69 | 2136 |
| 54 | 1947-48 . . . . . | 2190 | 335 | 2525 | 1944-45 | 2129 |
| 55 | 1948-49 . . . . . | 1983 | 328 | 2311 | 1934-35 | 2085 |
| 56 | 1949-50 . . . . . | 2228 | 316 | 2544 | 1894-95 | 2084 |
| 57 | 195O-51 . . . . . | 2320 | 308 | 2628 | 1965-66 | 2074 |
| 58 | 1951-52 . . . . . | 1583 | 387 | 1970 | 1922-23 | 2063 |
| 59 | 1952-53 . . . . . | 1357 | 392 | 1749 | 1901-02 | 2057 |
| 60 | 1953-54 . . . . . | 2499 | 420 | 2919 | 1937-38 | 2045 |
| 61 | 1954-55 . . . . . | 2023 | 416 | 2439 | 1936-37 | 1990 |
| 62 | 1955 56 . . . . . | 2548 | 421 | 2969 | 1951-52 | 1970 |
| 63 | 1956 57 . . . . . | 3726 | 440 (439) | 4166 (4165) | 1912-13 | 1965 |
| 64 | 1957-58 . . . . . | 2285 | 467 (465) | 2732 (2730) | 1945-46 | 1960 |
| 65 | 1958-59 . . . . . | 2626 | 490 (487) | 3116 (3113) | 1966-67 | 1956 |
| 66 | 1959-60 . . . . . | 2969 | 513 (508) | 3482 (3477) | 1935-36 | 1927 |
| 67 | 1960-61 . . . . . | 2528 | 541 (532) | 3069 (3060) | 1929-30 | 1918 |
| 68 | 1961 62 . . . . . | 3168 | 592 (587) | 3760 (3755) | 1906-07 | 1891 |
| 69 | 196261 . . . . . | 2481 | 598 (594) | 3079 (3075) | 1902-03 | 1868 |
| 70 | 1963-64 . . . . . | 2099 | 658 (652) | 2757 (2751) | 1913-14 | 1808 |
| 71 | 1964-65 . . . . . | 2736 | 661 (653) | 3397 (3389) | 1904-05 | 1770 |

| 1. | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| 72 | 1965-66 . . . . . | 1378 | 696 (689) | 2074 (2063) | 1952-53 | 1749 |
| 73 | 1966-67 . . . . . | 1181 | 776 (758) | 1957 (1939) | 1941-42 | 1715 |
| 74 | 1967-68 . . . . . | 1621 | 917 (898) | 2538 (2519) | 1920-21 | 1690 |
| 75 | 1968-69 . . . . . | 1140 | 996 (976) | 2136 (2116) | 1911-12 | 1451 |
| 76 | 1969-70 . . . . . | 1689 | 996 (976) | 2685 (2665) | 1905-06 | 1272 |
| 77 | 1970-71 . . . . . | 1749 | 996 (976) | 2745 (2725) | 1899-1900 | 1124 |
| 78 | 1971-72 . . . . . | 1235 | 996 (976) | 2231 (2211) | 1918-19 | 1009 |
| | Total 78 years | | 186695 (186524) | | | |
| | Average yield . . . | | 2394 (2392) | | | |
| | 75% dependable yield . . . | | 2060 | | | |

SOURCE: (A) 1894-95 to 1900-01
(i) Gauged flow as per APK-403.
(ii) Upstream utilisation same as for 1901-02.

(B) 1901-02 to 1924-25
(i) Gauged flow as per AP Note 10.
(ii) Upstream utilisation as per MRDK-VIII (P.I & pp. 25 to 53) + 5.71 for Vijayanagar channels.

(C) 1925-26 to 1950-51
Gauged flow and upstream utilisation as per Annexure-A to KW DT's order dated 10-4-1973.

(D) 1951-52 to 1970-71
(i) Gauged flow as per Chart APA-118.
(ii) Upstream utilisation from 1951-52 to 1960-61 as per MRA-15.
(iii) Upstream utilisation from 1961-62 to 1970-71 as per MRA-17.

(E) 1971 -72 . .
(i Gauged flow as per CWPC (K)-34.
(ii) Upstream utilisation same in 1970-71.
(iii) Upstream use of Vijayawada 275 TMC same as in 1968-69.

(F) . . .
Figures given in bracket are as per Andhra Pradesh.

Sd/-
T. KRISHNA RAO,
Counsel for Mysore State.
4-5-1973.

## APPENDIX Q

ANDHRA PRADESH "Z"

**Annual flow series at Vijayawada for the years 1894-95 to 1971-72 filed by the State of Andhra Pradesh**

DEPENDABLE FLOW OF THE RIVER KRISHNA UPTO VIJAYAWADA

Parties requested the Hon'ble Tribunal that for the purposes of allocation of water to the parties, 75 per cent dependable flow of the Krishna river upto Vijayawada including upstream utilisations may be determined at this stage With the able assistance of the counsel of the parties, after a thorough examination of the materials on record and after the careful consideration of all the aspects of the matter, the Hon'ble Tribunal directed that a flow series from 1894-95 to 1971-72 be prepared on the following lines:—

(1) The Hon'ble Tribunal has come to the conclusion that during the period 1901-02 to 1950-51 the flows on all days are modular except on the 116 days given at pages 170 to 172 of CW.PC. (K)-5.

(2) The Hon'ble Tribunal is of the opinion that for the period 1929-30 to 1950-51, for which the entire data is on record, the discharges are to be computed as per the following for mulae:

(a) For discharges, on modular days

$$Q = C_1 L \left[ (H+h_a)^{3/2} - h_a^{3/2} \right]$$

Where (i) H represents the head of flow over the anicut taking into consideration the average of the weighted averages of Vijayawada and Sitanagaram gauge readings

(ii) $h_a = 0.003025 H^2$

(iii) values of $C_1$ for different ranges of head are

| | | |
|---|---|---|
| O'— 3' | — | 2.60 |
| 3'— 6' | — | 2.75 |
| 6'— 9' | — | 3.00 |
| 9'— 11' | — | 3.10 |
| Above 11' | | 3.20 |

(b) for discharges on non-modular days.

$$Q=3.1L(h+h_a)^{3/2}-h_a^{3/2}+8CLd\sqrt{h+h_a}$$

(i) where h is the difference between the upstream and downstream water levels

(ii) d is the depth of the downstream water level above the anicut.

(iii) Values of c are as given at page (xvi) of K.G.C. Report Annexure-II.

(iv) $ha= 0.003625 (h+d)^2$

(c) for discharge over shutters

$$Q = 3.33 L \left[ (h_1+h_a)^{3/2} - h_a^{3/2} \right]$$

where $h_1$ is the head of flow over the top of the standing shutters and $ha= 0.003025 h_1^2$.

(d) The annual flows for the period 1929-30 to 1950-51 calculated as above and agreed to by all the parties in Exhibit MRK 334 be adopted.

(3) The Hon'ble Tribunal accepts the contention of Maharashtra as set out in their MR-Note 1 that for the period 1925-26 to 1928-29, the flow may be calculated in the same manner set forth in that note and the annual flows for that period, as agreed to by all the parties in Exhibit MRK 334 be adopted.

(4) The Hon'ble Tribunal accepts the contention of the Andhra Pradesh in para 9 of A.P. Note 10 filed on 3-5-1973 that for the years 1901-02 to 1924-25 the flows over anicut should be calculated in the manner set forth in that note.

(5) The Hon'ble Tribunal accepts the contention of Maharashtra and Mysore as given in MR Note 2 and MR Note. . . that for the years 1951-52 to 1971-72, the annual flows as per the figures set forth therein be adopted.

(6) The Hon'ble Tribunal is of the opinion that for the years 1894-95 to 1900-01, the recorded flows given at page 10 of Krishna Reservoir Project Vol. II (Exhibit APK 403) be adopted.

(7) The annual flows for the series 1894-95 to 1971-72 be arrived at taking the Upstream utilisation for different periods as indicated below :

(i) So far as the upstream utilisations for the period 1894-95 to 1900-01 are concerned, the same upstream utilisations as for the year 1901-02 be adopted.

(ii) The upstream utilisations for the period 1901-02 to 1955-56, as agreed to by all the parties be adopted.

(in) For the period 1956-57 to 1968-69, the upstream utilisations as per Mysore and Maharashtra be taken and the annual flows taking the upstream utilisation as per Andhra Pradesh be also shown in brackets against each year.

(iv) For the period 1969-70 to 1971-72, the same upstream utilisation as in 1968-69 be adopted, disregarding the extra utilisation if any, in these years. Parties agree that the flow series for the period 1894-95 to 1971-72 thus prepared be adopted for the purposes of determining 75 per cent dependable flow for the purposes of this case. The 75 per cent dependable flow as per the above series both as per Andhra Pradesh and also as per Mysore and Maharashtra is 2060 T.M.C.

**Statement Showing the Gross Yields of the Krishna River upto Vijayawada from 1894-95 to 1971-72**

(All Figures in T.M.C.)

| | | | Gross Yield in Descending Order | | | |
|---|---|---|---|---|---|---|
| | | | As per Maharashtra | | As per Andhra Pradesh | |
| Sl. No | Year | Gross Yield | Year of occurrence | Gross yield | Year of yield occurrence | Gross |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 1 | 1894-95 . . . . . | 2084 | 1956-57 | 4166 | l956-57 | 4165 |
| 2. | 1895-96 . . . . . | 2182 | 61-62 | 3760 | 61-62 | 3755 |
| 3. | 1896-97 . . . . . | 2611 | 16-17 | 3721 | 16-17 | 3721 |
| 4. | 1897-98 . . . . . | 2695 | 59-60 | 3482 | 59-60 | 3477 |
| 5. | 1898-99 . . . . . | 2587 | 64-65 | 3397 | 64-65 | 3389 |
| 6. | 1899-1900 . . . . . | 1124 | 03-04 | 3160 | 03-04 | 3160 |
| 7. | 1900-01 . . . . . | 2795 | 58-59 | 3116 | 58-59 | 3113 |
| 8. | 1901-02 . . . . . | 2057 | 62-63 | 3079 | 62-63 | 3075 |
| 9. | 1902-03 . . . . . | 1869 | 60-61 | 3069 | 60-61 | 3060 |
| 10. | 1903-04 . . . . . | 3160 | 14-15 | 3049 | 14-15 | 3049 |
| 11. | 1904-05 . . . . . | 1770 | 17-18 | 3029 | 17-18 | 3029 |
| 12. | 1905-06 . . . . . | 1272 | 55-56 | 2969 | 55-56 | 2969 |
| 13. | 1906-07 . . . . . | 1891 | 33-34 | 2936 | 33-34 | 2936 |
| 14. | 1907-08 . . . . . | 2276 | 53-54 | 2919 | 53-54 | 2919 |
| 15. | 1908-09 . . . . . | 2472 | 31-32 | 2903 | 31-32 | 2903 |
| 16. | 1909-10 . . . . . | 2144 | 46-47 | 2840 | 46-47 | 2840 |
| 17. | 1910-11 . . . . . | 2422 | 1900-01 | 2795 | 1900-01 | 2795 |
| 18. | 1911-12 . . . . . | 1451 | 63-64 | 2757 | 63-64 | 2751 |
| 19. | 1912-13 . . . . . | 1965 | 70-71 | 2745 | 57-58 | 2730 |
| 20. | 1913-14 . . . . . | 1809 | 57-58 | 2732 | 70-71 | 2725 |

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| 21. | 1914-15 . . . . . | 3049 | 1932-33 | 2703 | 1932-33 | 2703 |
| 22. | 1915-16 . . . . . | 2374 | 1897-98 | 2695 | 1897-98 | 2695 |
| 23. | 1916-17 . . . . . | 3721 | 1969-70 | 2685 | 1969-70 | 2665 |
| 24. | 1917-18 . . . . . | 3029 | 50-51 | 2629 | 50-51 | 2629 |
| 25. | 1918-19 . . . . . | 1007 | 38-39 | 2613 | 38-39 | 2613 |
| 26 | 1919-20 . . . . . | 2270 | 1896-97 | 2611 | 1896-97 | 2611 |
| 27. | 1920-21 . . . . . | 1690 | 98-99 | 2587 | 98-99 | 2587 |
| 23. | 1921-22 . . . . . | 2164 | 1949-50 | 2544 | 1949-50 | 2544 |
| 29. | 1922-23 . . . . . | 2063 | 67-68 | 2538 | 47-48 | 2526 |
| 30. | 1923-24 . . . . . | 2471 | 47-48 | 2526 | 67-68 | 2519 |
| 31. | 1924-25 . . . . . | 2324 | 08-09 | 2472 | 08-09 | 2472 |
| 32. | 1925-26 . . . . . | 2281 | 23-24 | 2471 | 23-24 | 2471 |
| 33. | 1926-27 . . . . . | 2177 | 54-55 | 2439 | 54-55 | 2439 |
| 34. | 1927-28 . . . . . | 2305 | 10-11 | 2422 | 10-11 | 2422 |
| 35. | 1928-29 . . . . . | 2212 | 15-16 | 2374 | 15-16 | 2374 |
| 36. | 1929-30 . . . . . | 1918 | 43-44 | 2333 | 43-44 | 2333 |
| 37. | 1930-31 . . . . . | 2196 | 24-25 | 2324 | 24-25 | 2324 |
| 38. | 1931-32 . . . . . | 2903 | 48-49 | 2311 | 48-49 | 2311 |
| 39. | 1932-33 . . . . . | 2703 | 27-28 | 2305 | 27-28 | 2305 |
| 40. | 1933-34 . . . . . | 2936 | 40-41 | 2287 | 40-41 | 2287 |
| 41. | 1934-35 . . . . . | 2085 | 25-26 | 2281 | 25-26 | 2281 |
| 42 | 1935-36 . . . . . | 1927 | 07-08 | 2276 | 07-08 | 2276 |
| 43. | 1936-37 . . . . . | 1990 | 19-20 | 2270 | 19-20 | 2270 |
| 44. | 1937-38 . . . . . | 2046 | 28-29 | 2212 | 28-29 | 2212 |
| 45. | 1938-39 . . . . . | 2613 | 30-31 | 2196 | 30-31 | 2196 |
| 46. | 1939-40 . . . . . | 2194 | 39-40 | 2194 | 39-40 | 2194 |
| 47. | 1940-41 . . . . . | 2287 | 1895-96 | 2182 | 1895-96 | 2182 |
| 48. | 1941-42 . . . . . | 1715 | 1926-27 | 2177 | 1926-27 | 2177 |
| 49. | 1942-43 . . . . . | 2169 | 42-43 | 2169 | 42-43 | 2169 |
| 50. | 1943-44 . . . . . | 2333 | 21-22 | 2164 | 21-22 | 2164 |
| 51. | 1944-45 . . . . . | 2129 | 71-72 | 2157 | 09-10 | 2144 |
| 52. | 1945-46 . . . . . | 1960 | 09-10 | 2144 | 71-72 | 2137 |
| 53. | 1946-47 . . . . . | 2840 | 68-69 | 2136 | 44-45 | 2129 |
| 54. | 1947-48 . . . . . | 2526 | 44-45 | 2129 | 68-69 | 2116 |
| 55. | 1948-49 . . . . . | 2311 | 34-35 | 2085 | 34-35 | 2085 |
| 56. | 1949-50 . . . . . | 2544 | 1894-95 | 2084 | 1894-95 | 2084 |
| 57. | 1950-51 . . . . . | 2629 | 1965-66 | 2074 | 1922-23 | 2063 |
| 58. | 1951-52 . . . . . | 1970 | 22-23 | 2063 | 65-66 | 2063 |
| 59. | 1952-53 . . . . . | 1749 | 01-02 | 2057 75% depend--able | 01-02 | 2057 75% depend--able |
| 60. | 1953-54 . . . . . | 2919 | 37-38 | 2046 | 37-38 | 2046 |
| 61. | 1954-55 . . . . . | 2439 | 36-37 | 1990 | 36-37 | 1990 |
| 62. | 1955-56 . . . . . | 2969 | 51-52 | 1970 | 51-52 | 1970 |
| 63. | 1956-57 . . . . . | 4166 (4165) | 12-13 | 1965 | 12-13 | 1965 |

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| 64. | 1957-58 . . . . . | 2732 (2730) | 1945-46 | 1960 | 1945-46 | 1960 |
| 65. | 1958-59 . . . . . | 3116 (3113) | 66-67 | 1957 | 66-67 | 1939 |
| 66. | 1959-60 . . . . . | 3482 (3477) | 35-36 | 1927 | 35-36 | 1927 |
| 67. | 1960-61 . . . . . | 3069 | 29-30 | 1918 | 29-30 | 1918 |
| 68. | 1961-62 . . . . . | 3760 (3755) | 06-07 | 1891 | 06-07 | 1891 |
| 69. | 1962-63 . . . . . | 3079 (3075) | 02-03 | 1869 | 02-03 | 1869 |
| 70. | 1963-64 . . . . . | 2757 (2751) | 13-14 | 1809 | 13-14 | 1809 |
| 71. | 1964-65 . . . . . | 3397 (3389) | 04-05 | 1770 | 04-05 | 1770 |
| 72. | 1965-66 . . . . . | 2074 (2063) | 52-53 | 1749 | 52-53 | 1749 |
| 73. | 1966-67 . . . . . | 1957 (1939) | 41-42 | 1715 | 41-42 | 1715 |
| 74. | 1967-68 . . . . . | 2538 (2519) | 20-21 | 1690 | 20-21 | 1690 |
| 75. | 1968-69 . . . . . | 2136 (2116) | 11-12 | 1451 | 11-12 | 1451 |
| 76. | 1969-70 . . . . . | 2685 (2665) | 05-06 | 1272 | 05-06 | 1272 |
| 77. | 1970-71 . . . . . | 2745 (2725) | 1899-1900 | 1124 | 1899-1900 | 1124 |
| 78. | 1971-72 . . . . . | 2157 (2137) | 1918-19 | 1007 | 1918-19 | 1007 |
| | | 1,86,623 | | | | |

| | AS PER MAHARASHTRA | AS PER A.P. |
|---|---|---|
| Gross average annual yield | 2393 TMC | 2390 TMC |
| Gross 75% dependable yield | 2060 TMC | 2060 TMC |

NOTE : Figures in Col. (3) for the period upto 1955-56 include upstream utilisations as agreed to by all the States. Figures in Col. (3) for the period 1956-57 onwards, include upstream utilisations as per Mysore & Maharashtra and those shown in Brackets include upstream utilisations as per Andhra Pradesh.

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Andhra Pradesh

Sd/-
P. Ramachandra Reddi
Counsel for Andhra Pradesh 4-5-73

## APPENDIX R

### Common draft of Part II prepared by Counsel for the States of Maharashtra, Mysore and Andhra Pradesh on 26-7-1973

*Clause XI (A) (i).*—An inter-State administrative Authority, to be called the "Krishna Valley Authority", (hereinafter referred to as "the Authority") shall be established. The Authority shall consist of 6 members who are, or have been, high ranking engineers with experience in irrigation. The States of Andhra Pradesh, Mysore and Maharashtra shall each appoint one such member. The three States shall make a joint request to the Government of India to appoint three members. The persons so appointed shall be independent of and shall not in any way be connected, directly or indirectly with any of the three States. The Government of India shall appoint one of the 3 members to be a Chairman of the Authority. As far as practicable, the first appointment of 6 Members of the Authority shall be made within 3 months from the publication of the decision of the Tribunal in the official Gazette.

(*ii*) Each member of the Authority shall be a full time member and shall be appointed for a term not exceeding 5 years. Each of the three States - shall nominate an alternate member to act during the period of absence of an appointed member. Any vacancy occurring in the Authority shall be filled in by the State or by the Government of India as the case may be. If any member appointed by the Government of India or by any of the States is unable or is unwilling to discharge his function for any length of time the respective Governments shall appoint another member in his place for such time as the appointed member is absent from duty. During the time that an appointed member is on leave and the alternate member nominated by the State is not available to act in his place, the State Government shall appoint a person who is qualified to be appointed as a member of the Authority to act during the period of leave. If any member appointed by the Central Government is on leave, the Central Government shall appoint another person who is qualified to be appointed as a member of the Authority to act in his place during the period of his leave.

(*iii*) The Government of India have consented to the appointment of three members to be members of the Authority and to filling in the vacancies arising among such members as provided in Sub-clauses (i) and (ii) above.

*(B)* Subject to the provisions of Clause (F) below, the Authority will dispose of any matter before it either by a circular or by holding a meeting. However, it will be open to any Member of the Authority to require that a meeting of the Authority shall be called or that a matter shall not be disposed of by a circular but at a meeting.

(C) The quorum for any meeting shall be 4 Members of the Authority and all decisions shall be taken by a majority of the votes cast by the Members present. If the Members are equally divided, the votes of the Members representing the States shall be ignored and the majority decision of the Members appointed by the Government of India shall prevail. If the Members appointed by the Government of India are equally divided, the matter shall be referred to the 3rd Member and shall be decided according to the majority vote of the three Members.

(*D*) The Authority shall from time to time prescribe by Rules of business, the class or classes of business which is of a formal or routine nature. The Authority shall not prescribe by Rules business to be of a formal or routine nature in which the interests of the States are conflicting.

(*E*) On any matter not being of a formal or routine nature where there is unanimity of 3 State Members on any matter, their decision shall be final and shall be implemented by the Authority. If, however, there is no unanimity among the three State Members, then the votes of the State Members shall be ignored and the matter shall be decided by a majority of the Members appointed by the Government of India.

(*F*) On the following matters the Authority shall record its decision by a resolution at a meeting in which all the three Members appointed by the Government of India are present:—

(i) Framing of Rules of Business.

(ii) Delegation of powers to a Member or Secretary or any official of the Authority.

(iii) Categorising a part of the business of the Authority as formal and routine.

(iv) Transfer or release of water from one State to another.

(v) Determination or adjustment of shares and/ or uses of the parties in accordance with the orders of the Tribunal.

(vi) Giving directions for the adjustment of water account of the parties.

(vii) Any other matter which the three States unanimously agree that it shall be decided at a meeting where all the three Members appointed by the Government of India are present.

*(G)* Subject to the preceding sub-clauses, the Authority shall frame its own Rules for the conduct of its business.

*Clause XII (A)*—It shall be the duty of the Krishna Valley Authority established under Clause XI (hereafter referred to as "the Authority") to ensure that waters of the river Krishna are stored, appropriated or used in the manner provided in the order of the Tribunal and for this purpose, it may do all things necessary, proper or convenient in the performance of its duties independently or in co-operation with the Governmental agencies of the three States and of the Government of India.

(*B*) For the effective discharge of the duties of the Authority, the Authority is empowered to do all or any of the following things :—

(i) The Authority shall determine the volume of water flowing in the river Krishna and its tributaries by such methods or devices as it thinks fit; it may utilise the information available from any existing gauge station or it may establish any gauge station anywhere in the territory of the three States.

(ii) The Authority shall determine the use of water made by any State at any place or any area at any lime and for that purpose it may take note of all diversions, or extractions whether natural or artificial, or partly natural and partly artificial from the river Krishna and its tributaries and measure such use by any method as it deems fit.

(iii) The Authority shall estimate the uses made for minor irrigation i.e., works utilising less than 1 T.M.C. each on the basis of the areas irrigated in each year and on the basis of the duties agreed upon by the three States in the agreement dated 26-8-1971 until another method or other duties are adopted by the Krishna Valley Authority either *suo motu* or on the application of any State to the Authority that the method and duties adopted in the agreement dated 26-8-1971 should be altered.

(iv) The Authority shall determine from time to time the water which has been stored by each State in any reservoirs, or any other storage. For the purpose of measuring of the water so stored, it may adopt any device or any method.

(v) In case of any doubt as regards storages, diversions or extractions on any project, the Authority shall exercise necessary check measurements to ascertain the correct figures of use on that project. Suitable check may also be exercised by that Authority on use made by the States on minor irrigation works.

(vi) The Authority shall employ a Secretary who shall be an Engineer and is not connected in any way with the three States. The Secretary shall not be a member of the Authority.

(vii) The Authority may request the State Governments to depute the services of the persons employed in State Government for part-time or whole-time employment with the Authority or for the performance of any work or services for the Authority.

(viii) The Authority shall employ such Engineering, Clerical and other personnel as it may consider necessary for the performance of its functions under the orders of the Tribunal as far as possible equally from the three States. The staff so employed shall be under the control of the Authority. The staff so employed shall be paid by and be responsible to and be under the control of the

Authority. The staff which is on deputation to the Authority shall be governed by the service regulations of the relevant State.

(ix) The Authority shall establish, maintain and operate such stream and other gauging stations, evaporation stations, telecommunications or other system of communication.

(x) The Authority shall determine necessary sluicing capacities required for the releases from reservoirs (existing as well as new) for the purpose of proper regulation and ensure that necessary works for the same are carried out immediately.

(xi) The Authority shall collect all facts and data requisite for determining that the provisions of the Tribunal's orders are at all times being complied with.

(xii) The Authority shall observe the operation of all developments in the Krishna basin and system.

(xiii) The Authority shall collect data from State Governments, on the area irrigated from each irrigation work using more than 1 T.M.C. power generation from each Hydro-electric Station, quantity drawn for domestic, municipal and industrial purposes.

(xiv) The Authority shall make and transmit to each of the States as early as possible and in any case before the end of the next water year a report covering the activities of the Authority for the preceding year and to make available to each State on its request any information within its possession any time and always provide access to its record to the States or their representatives.

(xv) The Authority shall keep a record of all meetings and proceedings, and maintain regular accounts, and shall maintain a suitable office where documents, records and accounts shall be kept open to inspection by the States or their representatives at such times and under such regulations as the Authority shall determine.

(xvi) The Authority shall enter into such contracts and agreements as may be necessary and essential to the full and complete performance of the powers and duties hereby conferred or imposed upon it.

(xvii) The Authority or any member duly authorised or a representative shall have power to enter upon any lands and property upon which any project or development of any project, or any work or gauging stations have been or are being constructed, operated or maintained by the States. Each State through its appropriate departments shall co-operate with the Authority in all matters which may be necessary to enable such Authority **to** exercise its powers and duties.

(xviii) The Authority shall publish annually and make available to the three States—

(1) water account of each water year;

(2) data of river discharges and gauges at all the gauging stations approved by it and at project sites (using more than 1 T.M.C- annually) during the water year;

(3) data of withdrawals for various uses at the project sites during the water year;

(4) estimated evaporation losses in storages during the water year;

(5) the data of water diversions out side the basin during the water year;

(6) the data of water wasted to sea below Vijayawada, if any during the water year;

(7) data of storage levels and capacities of the storages at regular intervals during the water year;

(8) methods of gauging adopted, formulae used and coefficients adopted at the various gauging sites and project sites ;

(9) data of area and crops irrigated during different seasons by the projects including minor irrigation schemes in the three States;

(10) duties adopted in working out utilisation on minor irrigation schemes; and

(11) data of units of power generated.

(C) The decision of the Authority on matters in sub-clauses (A) and (B) shall be final and binding on

the parties. However, the Authority may review its own decision either *suo motu* or on the application of any party.

(D) All the expenses incurred by the Krishna Valley Authority including the salaries or remuneration of the 3 Members appointed by the Central Government in the discharge of their work in operating this decree shall be borne by the three States equally.

*(E)* The Authority shall in the month of January of each year prepare detailed estimate for the amount of money required during the 12 months from the 1st day of April of the ensuing year showing the manner in which it is proposed to expend such money. A copy of the detailed estimate of this amount of money required for the working of the Authority shall be forwarded to each of the State Governments and the State Governments shall provide the amount of money so required.

(*F*) The Krishna Valley Authority shall decide the location of its central, regional and sub-regional offices.

Tentative Draft subject to approval of the State Governments.

Sd/-
P. RAMACHANDRA REDDI,
26-7-73
Advocate General, Andhra Pradesh,

Sd/-
T. KRISHNA RAO,
26-7-73
Counsel for the State of Mysore.

Sd/-
T. R. ANDHYARUJINA,
26-7-73
Counsel for the State of Maharashtra.

## APPENDIX S

**Agreed data regarding forests, minerals, industries and communications in the Krishna basin and a brief description of the population, topography, etc. of the State of Maharashtra, Mysore and Andhra Pradesh.**

*Forests :* In the Krishna basin, forests extend over nearly 3 million hectares. Forestry is an important industry.

In Maharashtra, the sub-tropical broad leafed hill forests of Mahabaleswar, Panchgani and Bhimashankar have luxuriant growths with evergreens predominating. Semi-evergreens and deciduous trees make their appearance on the slopes. The tropical moist and dry deciduous forests of the plains supply valuable limber, fuel and forest products.

Mysore has enormous forest wealth. The evergreen wet forests of the Western Ghats consist of huge trees set in thick masses of almost impenetrable vegetation, and interlaced with tufted bamboos with ground cover of bushes and profusion of climbers. The forests are rich in teak, ebony, cedar and blackwood. The rain-shadow belt of deciduos forests supply valuable timber and bamboo. The eastern districts are covered with deciduous and scrub forests with leak occurring at intervals. The northern parts have extensive grasslands.

In Andhra Pradesh, the principal forest areas are situated in Telengana and in the Nallamalai hills of Kurnool. They contain kosum, toon, teak, rosewood, and other varieties of useful timber and enormous quantities of bamboo.

In the forests of all the three States, a rich variety of medicinal herbs and forests produce are found.

*Minerals* : The Krishna basin is endowed with a variety of minerals. The minerals are being extensively exploited.

In Maharashtra, deposits of limestone occur in Sangli and Satara districts. Bauxite is found extensively in Kolhapur and Sangli districts. Basalt, granite and laterite furnish building material

Mysore has vast mineral resources. There are extensive and rich deposits of iron and Manganese ore in Bellary, Chikamagalur. Dharwar, Shimoga, Belgaum, Bijapur and Chitradurga districts. Bauxite deposits occur extensively in Belgaum district. There are deposits of chromite, copper, lead and tin. Non-metallic minerals such as feldspar, kaolin, limestone, kyanite, quartz, soapstone, ochre, granite, gneisses and marbles are found extensively. There are also deposits of asbestos, corundum, graphite and fireclay.

In Andhra Pradesh there are huge resources of coal in Khammam district. Iron ore is found in Khammam, Krishna, Anantpur, Cuddapah and Kurnool districts. There are extensive deposits of limestone in Hyderabad, Nalgonda, Mahbubnagar, Cuddapah, Kurnool and Guntur districts. Barytes occur in Anantpur, Kurnool, Khammam, Krishna and Cuddapah districts, while asbestos occurs in Cuddapah, Kurnool and Anantpur districts. Large deposits of talc are found in Anantpur, Kurnool and Mahbubnagar districts. Graphite is found in Khammam district and quartz in and around Hyderabad. Slate occurs in Kurnool district. Copper and Lead are found in sizeable quantities in Guntur district.

*Industries :* Since Independence, the Krishna basin has made rapid headway in industrialisation. Hyderabad and Poona are the two largest cities in the basin.

In Maharashtra, factory industries are highly diversified. Greater Poona, Bombay-Poona Road, Poona-Ahmednagar Road and Poona-Sholapur Road are becoming vast industrial complexes of diversified engineering, paper and other industries. Sholapur is an important centre of textile industry. The Krishna-Panchaganga basin, including Kolhapur and Sangli are developing important textiles, sugar and engineering industries. Sugar factories are located in the sugar belt of the Nira valley and also in the Krishna,

Warna and Panchaganga valleys. Small Scale agro-based industries, bidi making, metal products, printing, chemicals, woodwork and textile units are widely dispersed.

In Mysore, Bhadravathi is an important centre of iron and steel, cement and paper production. There are textile and spinning mills in Bijapur, Belgaum, Chitradurga, Gulbarga and Raichur districts. A large aluminium and steel industrial complex is coming up in Belgaum and Bellary districts. There are sugar industries in Tungabhadra, Ghataprabha, Malaprabha and Middle Krishna valleys. Cement factories exist in Bijapur and Gulbarga districts.

In Andhra Pradesh, Hyderabad and its environs have a vast industrial complex of heavy electricals, machine tools, synthetic drugs, detonators, textiles, aeronautics, electronics and other industries. There are factories for manufacture of sugar, cement, power, alcohol, paper, textiles and miscellaneous products in other industrial centres. Hyderabad is famous for its handicrafts. Guntur-Vijayawada region is a growing industrial zone with factories manufacturing cement, scooters, tyres and tubes, rice mills and tobacco processing factories. In Anantpur and Kurnool districts there are major textile and oil mills.

In all the three States, rural and small scale industries are being carefully fostered. Traditional handicrafts and household industries play an important part in the village economy. Animal husbandry and transport are important industries.

*Communications:* The basin is served by the Central, Southern and South Central Railways. The main line connecting Bombay and Madras passes through it in its upper reaches. The main Madras-Calcutta line passes through the basin just above the delta. The main line between Delhi and Vijayawada passes through the lower Krishna basin between Kazipet and Vijayawada. There are some branch lines, partly, or wholly in the basin, namely, Secunderabad-Wadi line, Poona-Bangalore line, Kazipet-Hyderabad line, Secunderabad—Dronachalam Guntakal-Bangalore line, Masulipatnam-Vijayawada - Guntur - Guntakal - Bellary - Hospet-Hubli-Marmagao line, Guntur-Macherla line. Dornakal - Yellandu (Singareni Collieries) line, Miraj-Kurudwadi-Lature line, Dhond-Manmad line, Birur-Talaguppa line and Godog-Sholapur line. These lines serve some of the prominent towns like Hyderabad, Secunderabad, Guntur, Vijayawada, Masulipatnam, etc., in Andhra Pradesh, Poona, Satara, Sangli, Miraj. Sholapur, Kolhapur, Ahmednagar in Maharashtra and Belgaum, Hubli-Dharwar, Raichur, Davangere, Bhadrawathi, Shimoga, Gulbarga and Bijapur etc. in Mysore.

National Highways connecting Bombay with Vijayawada, Hyderabad with Nagpur, Madras with Calcutta, Poona with Bangalore, Chitradurga with Sholapur, Bangalore with Hyderabad, Hyderabad with Sholapur traverse the Krishna basin. Besides these, there is a network of State Highways, district and village roads connecting important towns and villages.

*Population of States :* The total areas of the States of Maharashtra, Mysore and Andhra Pradesh are respectively 1,18,200 ; 74,210 ; 1,06,052 sq. miles and their respective population according to the Census of India 1971 final figures are 50,412,235; 29,299,014; and 43,502,708 respectively.

The following table prepared from the provisional population totals of the Census of India 1971 gives the distribution of working population by agricultural and other workers:—

| State/Distt. | Total workers | Cultivators | Agricultural labourers | Workers other than cultivators and agricultural labourers. |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |
| Maharashtra . . . . . | 18,732,169 | 6,572,447 | 5,429,631 | 6,730,091 |
| Mysore . . . . . | 10,291,184 | 4,088,722 | 2,647,851 | 3,554,611 |
| Andhra Pradesh . . . . . | 18,086,588 | 5,829,356 | 6,763,494 | 5,493,738 |

It will be seen that the precentage of total number of cultivators and agricultural labourers to total workers is 64.07 per cent in Maharashtra, 65.46 per cent in Mysore and 69.63 per cent in Andhra Pradesh.

**Brief description of the States**

ANDHRA PRADESH :

Andhra Pradesh is the fifth largest State in India with an area of 276,754 sq. km. (106,855 sq. miles) and a population (1971) of 43.503 million people which makes it the fifth most populous State of the country.

Topographically, there are four major divisions in the State—(i) the coastal belt, (ii) the Deccan Plateau south of the Krishna, (iii) the Deccan Plateau north of the Krishna and (iv)the Eastern Ghats Region.

The coastal belt lies in eight coastal districts of Srikakulam, Visakhapatnam, East Godavari, West Godavari, Krishna, Guntur, Prakasham and Nellore. The belt is 80 km. wide and 965 km. long and the area has an average rainfall of 1015 mm. The alluvial deltas of the Godavari, the Krishna and the Pennar rivers lie in the coastal belt.

The Deccan plateau south of the Krishna comprises the upland taluks of the coastal districts of Guntur, Prakasham and Nellore and the four Rayalaseema districts of Kurnool, Cuddapah, Anantpur and Chittoor. It lies at an altitude of 15 to 610 m above sea level and has scanty rainfall of 508 to 635 mm.

The Deccan plateau north of the Krishna is an extensive Plateau with an average elevation of 366 m above mean sea level comprising, in addition to the upland taluks of the coastal districts of Krishna and West Godavari, the Telangana districts of Hyderabad, Nizamabad, Adilabad, Medak, Warangal, Khammam, Nalgonda, Karimnagar and Mahbubnagar. The average rainfall is about 762 mm.

The Eastern Ghats Region consists of thickly forested hills climbing to an altitude of 1,067 m above sea level comprising the districts of Srikakulam, Visakhapatnam and East Godavari. It has heavy rainfall ranging from 1,778 mm. to 2,540 mm.

About 79 per cent of the cultivated area of the State is under food crops. Because of the extent of fertile delta and coastal areas, paddy is the predominant crop and covers 23 per cent of the cropped area. Other important food crops are jowar, bajra and ragi. Among commercial crops, the most important are tobacco, castor, sugarcane, groundnut, cotton and chillies.

MAHARASHTRA :

50.412 million people live in the 308,000 sq. km. of Maharashtra.

The State can be divided into three natural regions: (i) the Konkan coast; (ii) the basins of the Krishna and Godavari, and (iii) the basins of the Tapi and the Narmada.

The Konkan coastal strip is separated from the rest of the State by the Sahyadri range which throws out numerous low spurs towards the east and west. Between these spurs, the valleys are drained by streams running from the east almost due west into the Arabian Sea.

The basins of the Krishna and the Godavari vary in height from about 610 m. in the west to about 152 m. in the east. Summer temperatures in the West are lower than in the east.

The Krishna basin includes the Bhima sub-basin which lies between the Mahadeo range and the Balaghat range. The Krishna basin proper extends from the Mahadeo range to the southern boundary of the State, but much of it lies outside the State. With the exception of a strip spreading 40 to 56 km. from the western edge, the basin consists of the undulating plateau lands of the deccan.

Broadly speaking, the western part of the State, from the sea to a line about 65 km to the east of the Sahyadri range, is hilly and undulating. Elsewhere, the undulation is less marked and depends very largely on how close the area is to one or other of the watersheds between the several basins and sub-basins.

The prevalent climate is of the tropical monsoon type, though the plateaus and hill areas of the State have lower temperatures and less humidity than the coastal strip.

The average rainfall of the State is about 1,070 mm though there are wide variations in precipitation. The heaviest precipitation during the south-west monsoon is on the Sahyadri run of the plateau and in the Maval area to the east, up to a distance of 15-25 km. At the rim, the rainfall is very heavy and exceeds 6,500 mm at places like Mahabaleshwar. It decreases rapidly westwards towards the coast, where it is about 3,200 mm in the south and about 2,000 mm in the north.

East of the Sahyadri, the decrease is very marked and in areas 15 km from the ridge the precipitation drops to about 1,250 mm. In a strip about 30-50 km wide east of Maval and running parallel to the Sahyadri range, the average rainfall is less than 650 mm

and at places below 500 mm. Further east it gradually increases, till it averages 1,250 mm in the most eastern districts.

Geologically, major portion of the State is underlain by Deccan trap of volcanic origin and of more or less uniform composition. The entire Krishna drainage basin in Maharashtra is underlain by Deccan trap. The main districts with trap formations are Ratnagiri, Kolhapur, Satara and Poona. The eastern districts are underlain by granites, gneisses and other mixed rock formations.

The most important food crops are jowar, bajra, paddy and wheat. Among the cash crops, the most important are cotton, groundnut and sugarcane.

MYSORE :

With an area of 1,91,773 sq- km. and a population (1971) of 29.299 million, Mysore is the sixth largest State in the country in size and the eighth in population.

The State consists of four distinct regions: (i) the coastal belt lying between the Western Ghats and the Arabian Sea ; (ii) Malnad to the east of the Western Ghats; (iii) the northern plateau and (iv) southern plateau.

Mysore's 320 km. long coastal strip is only 32 km. in width. It has heavy and sustained rainfall during the south-west monsoon season.

The land-locked Malnad area adjoining the coastal belt to the east runs north to south for about 644 km. with a width of 48 to 65 km. It is an area of forests and hills with a rugged topography, characterised by deep ravines and steep hills rising to heights of 1,250 to 1,890 m. which are the source of all the east and west flowing rivers of the State. Malnad gets heavy and assured rainfall, ranging from an average of 254 cm with peaks of 635 cm in the hills to 105 cm in the east towards the plains. The mean monthly temperatures range between 18°C and 24°C which are normally lower than those on the coast. On terraced fields, paddy is the major crop followed by garden crops like coffee, arecanut and coconut.

The Northern plateau drained by the Krishna, the Bhima and the Tungabhadra rivers is an extensive plateau with an average elevation of 610 m above mean sea level. It has an average rainfall of only 61 cm or less. The western region has between 58 and 91 cm of rain while other areas get 40.6 to 91 cm. It is a region of hot summers and warm winters, where the winter temperatures range between 22°C and 25°C and summer temperatures go up to 43°C. The landscape is monotonous, with vast areas of treeless fields and black cotton soils on which jowar, wheat and cotton are grown.

The Southern plateau has a rolling topography with predominantly red soils intermixed with black soils. The rainfall is variable but not heavy, increasing from east to west. Irrigation is from a large number of tanks dotted all over the plateau and the crops grown are rice and sugarcane. The bulk of the dry land is under jowar, bajra, ragi, castor and pulses. In the valleys, there are plantations of coconut and arecanut. Temperatures in the southern plateau are lower than those in the north.

The seasons are clearly marked ; a short (January-February) cold weather is followed by three months (March to May) of hot weather. The south-west monsoon prevails from June to September and the north-east monsoon which sets in October continues till December.

## APPENDIX T

**Particulars of Visits by the Krishna Water Disputes Tribunal to Various Works and Sites in the Krishna Basin in the States of Maharashtra, Andhra Pradesh and Mysore.**

| | | Distance travelled (by road) K.M. | |
|---|---|---|---|
| **October, 1971** | | | |
| 3rd to 4th | | | Assembled at Bombay. |
| 5th | Bombay to Khopoli . . . . | 115 | Visit to Tata Hydel works. |
| 5th | Khopoli to Poona . . . . | 83 | Halt overnight. |
| 6th | Halt at Poona . . . . | 93 | Inspection of 3-D model of Old Krishna Anicut at Central Water & Power Research Station, Poona; visit to Khadakwasla Dam and APanchet Dam. |
| 7th | Halt at Poona . . . . . | 315 | Visit to Bhima Irrigation Project site and works under construction. |
| 8th | Poona to Mahabaleshwar . . . | 144 | Visit to Bhatgarh Dam en route. |
| 9th | Mahabaleshwar to Koynanagar. . . | 200 | Visit to Mahabaleshwar temple, the traditional source of the river Krishna. |

| | | Distance travelled (by road) K.M. | |
|---|---|---|---|
| **October, 1971** | | | |
| 10th | Halt at Koynanagar . . . | 76 | Visit to Model Room and inspection of the models of Koyna Dam, underground works, intake tower, surge tank, penstocks, etc.; visit to Koyna Dam, Navaja Intake Tower and other works; visit to Pophali Power House. |
| 11th | Koynanagar to Poona . . | 205 | Inspection of Lift Irrigation Schemes en route |
| 11th | Poona to Hyderabad . . . | | By Secunderabad Express. |
| 12th | Halt at Hyderabad . . . | | General review of the tour in Maharashtra. |
| 13th | Halt at Hyderabad . . . | 70 | Visit to Andhra Pradesh Engineering Research Laboratories and inspection of Demonstration Model, Landscape Model 2-D Model, etc. ; visit to Himayatsagar and Mir Alam Tank. |

| | | Distance travelled. (by road) K.M. | |
|---|---|---|---|
| **October, 1971** | | | |
| 14th | Hyderabad to Nagarjunasagar Dam. | 255 | Inspection of areas of Nalgonda district en route; visit to Nagarjunasagar Dam; inspection of Right Bank Canal upto tunnel and Left Bank Canal Head Regulator. |
| 15th | Nagarjunasagar Dam to Vijayawada. | 223 | Inspection of Nagarjunasagar Right Bank Canal and its command areas en route; visit to Model Room. Inspection of Prakasam Barrage, Old Krishna anicut site, plough and plough tracks. |
| 16th | Vijayawada to Nagarjunasagar Dam. | 260 | Inspection of Prakasam Barrage, old ploughs, Sitanagaram and Vijayawada gauges and portion of Krishna Delta canal at Vijayawada. |
| | | | Inspection of command area of Nagarjunasagar Left Bank Canal, sub-basins |

| | | Disnce travelled (by road) K.M. | |
|---|---|---|---|
| **October, 1971** | | | of Muneru, Paleru, Musi, Regulator at M. 72/0 of Nagarjunasagar Left Bank Canal en route. |
| 17th | Nagarjunasagar Dam to Srisailam . . | 245 | Halt overnight. |
| 18th | Halt at Srisailam . . . . . | 15 | Inspection of Srisailam Project site and works under construction. |
| 19th | Srisailam to Kurnool . . . . | 238 | Inspection of Mittakondala Ridge, Kurnool-Cuddapah Canal and ayacut en route; inspection of Sunkesula anicut. |
| 20th | Halt at Kurnool . . . . | 152 | Inspection of site of proposed Jurala Project and areas in Gadwal and Alampur Taluks. |
| 21st | Kurnool to Tungabhadra Dam . . | 432 | Inspection of South Gadwal Branch canal alignment ; entry into Mysore territory near Yargera; inspection of Rajolibunda Diversion Headworks; Mysore's Lift Irrigation Schemes en Rajolibunda main canal, command areas of Tungabhadra Left Bank Canal. |

| | | Distance travelled (by road) K. M. | |
|---|---|---|---|
| **October, 1971** | | | |
| 22nd | Halt at Tungabhadra Dam. . . | 127 | Visit to Munirabad Power House, Tungabhadra Dam, Headworks of Left Bank Low Level and High Level Canals, Raya & Basavanna Channels, Headworks of Right Bank Power Canal and High Level Canal; Right Bank Power House and Hampi Power House. |
| | 23rd Halt Tungabhadra Dam . . | 223 | Inspection of command areas of Tungabhadra Left Bank Canal, Sanapur Anicut, Anigundi Channel and Relief Model of Tungabhadra Dam. |
| 24th | Tungabhadra Dam to Bagalkot . . | 318 | Inspection of Gundlakeri Regulator, Tungabhadra Right Bank Low Level Canal Head Sluices, Turtha Channel, Head Sluices, from Gundlakeri Vank into Turtha Channel, command areas of Malaprabha Right Bank Canal and Ghataprabha Right Bank Canal, site of Ramthal Lift Irrigation Scheme. |

| | | Distance travelled (by road) K. M. | |
|---|---|---|---|
| **October 1971** | | | |
| 25th | Bagalkot to Narayanpur Dam . . . | 191 | Inspection of Almatti Dam works, Narayanpur Dam work and Left Bank Canal work under construction. |
| 26th | Narayanpur Dam to Bijapur . . . | 279 | Inspection of command area of Left Bank Canal of Upper Krishna Project. |
| 27th | Bijapur to Belgaum . . . . | 246 | Inspection of Command areas of Ghataprabha Left Bank and Right Bank Canals, Gokak Falls, Dhupdal Weir, Headworks of Gokak Canal and Hidkal Dam and works under construction. |
| 28th | Belgaum to Jog Falls | 337 | Inspection of Malaprabha Dam site and Right Bank Canal and works under construction. |

| October 1971 | | Distance travelled (by road) K. M. | |
|---|---|---|---|
| 29th | Jog Falls to Bhadravathi . | 252 | Inspection of Tunga Anicut. |
| 30th | Halt at Bhadravathi | 316 | Visit to confluence of the Tunga and the Bhadra Rivers; inspection of command area of Upper Bhadra Project. |
| 31st | Bhadravathi to Hassan . | 211 | Visit to Bhadra Dam and inspection of command area of Bhadra Project. |

| November, 1971 | | Distance travelled (by road) K. M. | |
|---|---|---|---|
| 1st | Hassan to Mysore . | 188 | Journey. |
| 2nd to 3rd | Halt at Mysore . . | | General review of the entire tour. |
| 4th | Mysore to Delhi via Bangalore. | | |

Sd/-
K.S. SHANKER RAO
7-11-73
Maharashtra

Sd/-
H.S.S. IYENGAR
7-11-73
Karnataka

Sd/-
G.K.S. IYENGER
7-11-73
Andhra Pradesh

## APPENDIX U

**Orders of the Tribunal dated the 19th April, 1971 and the 27th July, 1971.**

KRISHNA : 19th April, 1971.

**BEFORE THE KRISHNA WATER DISPUTES TRIBUNAL**

IN THE MATTER OF A WATER DISPUTE AND CONNECTED MATTERS REGARDING THE INTER-STATE RIVER KRISHNA AND THE RIVER VALLEY THEREOF—

ORDER

The parties have jointly handed over agreed minutes of the order (Annexure A) signed by Counsel for the States of Andhra Pradesh, Maharashtra, Mysore, Madhya Pradesh and Orissa. There will be an order in terms of the agreed minutes.

Sd/-
(R. S. BACHAWAT)
*Chairman*

Sd/-
(SHAMSHER BAHADUR)
*Member*

Sd/-
(D. M. BHANDARI)
*Member*

NEW DELHI :
Dated : April 19, 1971.

**ANNEXURE 'A'**

**IN THE KRISHNA RIVER DISPUTE**

1. Parties have agreed that each of the States concerned will be at liberty to divert any part of the share of the Godavari waters allocated to it by the Godavari Tribunal from the Godavari basin to any other basin.

2. In view of the pleadings and the statements of the States concerned, none of the States asks for a mandatory order for diversion of the Godavari waters into the Krishna basin.

3. All the other contentions of the parties are reserved and will be decided in the Krishna case.

4. The Krishna case will be decided separately from the Godavari case.

5. The States of Madhya Pradesh and Orissa are ordered to be discharged from the record of this case and will no longer be parties to this case.

6. The States of Madhya Pradesh and Orissa will bear and pay their own costs.

Sd/—P. Rama Chandra Reddy, Advocate General, Andhra Pradesh.
Sd/—H. M. Seervai, Advocate General, Maharashtra.
Sd/—T. Krishna Rao, Advocate, Mysore.
Sd/—K. A. Chitale, Advocate General, Madhya Pradesh.
Sd/—L. M. Singhvi, Senior Advocate, Orissa.

KRISHNA : 27th July, 1971.

**BEFORE THE KRISHNA WATER DISPUTES TRIBUNAL**

**In the matter of a water dispute and connected matters regarding the inter-state river Krishna and the river valley thereof.**

ORDER

There will be an order in terms of the agreed minutes (Annexure 'A') which have been signed by Counsel for all the parties and have been jointly handed over to the Tribunal.

Sd/-
(R. S. BACHAWAT)
*Chairman*

Sd/-
(SHAMSHER BAHADUR)
*Member*

Sd/-
(D. M. BHANDARI)
*Member*

NEW DELHI :
Dated : July 27, 1971.

ANNEXURE 'A'

KRISHNA WATER DISPUTES TRIBUNAL

By consent of the parties Clause (1) of Annexure 'A' to the Order dated 19th April, 1971, is amepded by inserting the words "which may be" between the word 'waters' and the word 'allocated' so that the amended Clause (1) will now read as follows :—

(1) Parties have agreed that each of the States concerned will be at liberty to divert any part of the share of the Godavari waters which may be allocated to it by the Godavari Tribunal from the Godavari basin to any other basin.

Sd/- P. Rama Chandra Reddy, Advocate General, Andhra Pradesh.

Sd/-H. M. Seervai, Advocate General, Maharashtra.

Sd/- T. Krishna Rao, Advocate, Mysore.

Sd/- K. A. Chitale, Advocate General. Madhya Pradesh.

Sd/-Santosh Chatterjee, Advocate for the State of Orissa.

Dated : 27th July, 1971.

MGIPRRND-3 I&P/73—Sec, III Day—26-8-74—2000