Public works Department

Madras State

Administration Report

1951-52 Part I. E

PUBLIC WORKS DEPARTMENT
MADRAS STATE

ADMINISTRATION REPORT

FOR THE YEAR 1951-52

PART I-B
(STATISTICAL PORTION)

PRINTED BY THE SUPERINTENDENT
GOVERNMENT PRESS
MADRAS
1953

Price, 1 *rupee* 12 *annas*

IRRIGATION MAP

MADRAS STATE

SCALE OF MILES

50 0 50 100 MILES

I PRODUCTIVE WORKS

1 CAUVERY DELTA SYSTEM
2 SRIVAIKUNTAM ANICUT SYSTEM
3 GODAVARI DELTA SYSTEM
4 MEHAMATTUR ANICUT SYSTEM
5 THADAPALLI CHANNEL SYSTEM
6 KALINGARAYAN CHANNEL SYSTEM
7 VRIDDACHALAM ANICUT SYSTEM
8 CHEMBARAMBAKKAM TANK SYSTEM
9 MARUDUR ANICUT SYSTEM
10 PENNAR RIVER CANALS SYSTEM
11 ARKENKOTA CHANNEL SYSTEM
12 TIRUKKOYILUR ANICUT SYSTEM
13 SHATIATOPE ANICUT SYSTEM
14 CHEYYAR ANICUT SYSTEM
15 CUMBUM TANK SYSTEM
16 POINEY ANICUT SYSTEM
17 PERIYAR ANICUT SYSTEM
18 KISTNA DELTA SYSTEM
19 NANDIYAR CHANNEL SYSTEM
20 LOWER COLEROON ANICUT SYSTEM
21 KISTNA EAST BANK CANAL EXTENSION SCHEME
22 POLAVARAM ISLAND PROJECT
23 CAUVERY-METTUR PROJECT
24 KATTALAI SCHEME

2 UNPRODUCTIVE WORKS:

1 KURNOOL-CUDDAPAH CANAL
2 BARUR TANK
3 VALLUR ANICUT
4 MADRAS WATER-SUPPLY AND IRRIGATION SYSTEM
5 PELANDORAI ANICUT SYSTEM
6 PALAR ANICUT SYSTEM
7 CHICACOLE MINOR RIVER SYSTEM
8 MUNIYERU SYSTEM
9 DONDAPAD TANK
10 YERUR TANK
11 SAGILERU SYSTEM
12 ATMAKUR TANK
13 JANGAMAHESWARAPURAM TANK
14 ANAMASAMUDHAM-BERAPERU TANK
15 HAJIPURAM TANK
16 PONNALUR TANK
17 MARKAPUR TANK
18 NAGAVALLI RIVER SYSTEM
19 VENKATAPURAM TANK
20 BHAVANASI TANK
21 YELLANUR TANK
22 PANJAPATTI RESERVOIR
23 SIDDAPUR TANK
24 NAGAVARAM ANICUT AND SUPPLY CHANNEL
25 MOPAD RESERVOIR SYSTEM
26 KANNIYAMPALAYAM ANICUT
27 TOLUDUR RESERVOIR PROJECT
28 TIPPAYAPALEM PROJECT
29 BASAVANNAH CHANNEL
30 DUVVALERU PROJECT
31 UDUTHORAHALLA SCHEME

REFERENCE

EXISTING WORKS
IRRIGATED AREA
STATE BOUNDARY
RAILWAY LINE
MADRAS STATE
▲.P.1 PRODUCTIVE WORK } Nº 1,2,3 ETC GIVEN REFER TO THE SERIAL Nº IN THE STATEMENT ON THE LEFT CORNER
▲.U.1 UNPRODUCTIVE WORK }

TRACED BY V.P.N.

PUBLIC WORKS DEPARTMENT, MADRAS STATE

ADMINISTRATION REPORT

FOR THE YEAR 1951-52

PART II-A—IRRIGATION

Chapter I.

PERSONNEL.

1·1. Sri A. R. Venkatachari, B.E., M.I.E. (Ind.), M.AM. SOC.C.E., I.S.E., continued to be the Chief Engineer (Irrigation) in the year under report.

1·2. Sri M. S. Thirumale Iyengar, B.E., M.I.E. (Ind.), I.S.E., continued to be the Chief Engineer (Tungabhadra Project) in the year under report.

1·3. Sri T. S. Venkatarama Ayyar, B.E., M.I.E. (Ind.), I.S.E., continued to be the Chief Engineer (Grow More Food) in the year under report.

1·4. Sri M. D. Narasimhachari, B.A., B.E., continued to be the Deputy Chief Engineer (Irrigation) in the year under report.

1·5. Sri V. A. Krishnaswami, B.E., continued to be the Additional Deputy Chief Engineer (Irrigation) in the year under report.

1·6. Sri A. Krishnamurthi Ayyar, B.E., continued to be the Deputy Chief Engineer (Tungabhadra Project) till 14th May 1951, *a.n.* when Sri K. Padmanabha Pillai, B.E., A.M.I.E. (Ind.) took charge of the post and continued to be in charge of the post.

Chapter II.

A BIRD'S-EYE VIEW OF IRRIGATION IN MADRAS STATE.

2·01. A brief summary of the irrigation systems in the State is given below.

2·02. In the Circars, we first have in the extreme north of the Presidency, the Bahuda river and Padmapuramgedda irrigating an extent of 6,000 acres; next the Chicacole Minor Rivers System comprising a number of channels taking off from the rivers the Vamsadhara and the Langulya and also the hill stream Garibulagedda and irrigating about 67,000 acres. The Nagavalli system irrigates the next largest area in Visakhapatnam district. By means of a regulator across the river at Thotapalli, sufficient water is diverted through a main canal and its branch channels to irrigate roughly 28,000 acres. The project was completed in 1909 and has been of great benefit to the ryots. In the southern portion of the Visakhapatnam district, there are again a number of channels taking off from the Varaha and the Sarada rivers. The former system irrigates about 18,000 acres and the latter 9,000 acres.

2·03. The next is the Godavari delta. To those who have not the local knowledge the fact that the value of the crops now grown annually in this delta is several crores will convey a very meagre idea of the benefits of irrigation. The Godavari ryots have recently erected at Dowlaishwaram, Bobberlanka and Chettipetta statues to commemorate the memory of Sir Arthur Cotton, the originator of the scheme, and by doing so have shown their appreciation of what he has done for the district by his monumental works for securing copious supply of precious water to their lands. Roughly one and half million acres of both first and second crops are irrigated by the network of canals and channels thousands of miles long; the value of the crops grown annually exceeds nine crores. The canals

have been designed not only for irrigation but also for navigation. Sixty locks have been built and more are being considered. About 400 miles of canals are navigable for boats up to 90 tons capacity and the major part of the exports and imports from and to the delta is conveyed by boat. That this connected system of navigation has helped a great deal to the prosperity of the Godavari and the Krishna ryots will be appreciated when it is stated that the cost of transport to Madras by water is only one-eighth to one-tenth of the cost of transport by cart or other means. For instance, the cost of transport per bag of rice from the Kakinada port to Rajahmundry is 6 pies whereas that from Nagapattinam port to Tanjore is four annas even though the distance to be covered is the same in both the cases ; this is because water transport is available in the former and not in the latter case. By means of the Godavari and Krishna canals and Buckingham Canal, one can go by boat from Madras to Kakinada, a distance of 400 miles, and from Rajahmundry one can continue the journey by boat beyond Bhadrachalam right up to the Central Provinces, a further distance of 188 miles.

2·04. The next is the Krishna delta. Just over a century ago, famines were recurrent in these parts and the appalling conditions that were then prevailing induced the Government of the day to push forward the Godavari and Krishna projects. At Vijayavada in the Krishna district, an anicut was built across the Krishna in 1855 (shortly after the completion of the anicut at Dowlaishwaram). The anicut diverts water through a network of canals and channels to irrigate over nine lakhs acres in Krishna and Guntur districts. The Krishna canals are also navigable and the greater part of the trade of the deltaic portions of the two districts is carried on by boats. Our Godavari and Krishna projects are probably the most beneficial and most successful irrigation schemes ever executed by any Government in the world. They have improved the condition of the people of the districts beyond the highest expectations of the originator, while the return on the capital invested in building them has sufficed not only to maintain and keep the systems up to date but has provided a continuous source of revenue which has enabled Government to initiate other projects, far less attractive financially in less favoured districts.

2·05. It should be stated here that we have till now utilized only six per cent of the annual flow of the Godavari and seven per cent of the annual flow of the Krishna and we are still a great way from utilizing the large quantity of water that flows to the sea.

2·06. Leaving the rich districts of Guntur and Krishna and coming down to Nellore, we meet a dry and barren district but advantage has been taken of such facilities as exist for extending irrigation. Near the sea coast, the rainfall is generally favourable, and with the addition of some extra water, supplied by means of irrigation, excellent crops are grown. Nellore rice is famous for its quality. Two anicuts across the Pennar divert water to the Kanigiri and the Sarvapalli reservoirs and about 165,000 acres of paddy are cultivated under them annually. Further inland, the Mopad reservoir built in 1921 as a famine-protective work has fulfilled the purpose for which it was intended.

2·07. Leaving Nellore, we shall divert from our course for a few moments and strike west and north-west to have a glimpse at Cuddapah, Kurnool, Bellary and Anantapur districts. These districts known as " Rayalaseema " are in the famine zone and are periodically liable to failure of rain and consequent drought. Irrigation in Rayalaseema is by the very nature of the country difficult. Rainfall with its consequential river and stream flow is the first requirement for a successful irrigation scheme and when rain fails in the locality we propose to benefit, we must look to some external source, for example, a river whose main catchment area is outside the districts liable to failure for supply. Irrigation schemes in Rayalaseema depending on local rains must, generally speaking, be of doubtful utility. Proposals for tapping the supplies from the perennial Tungabhadra have been under examination, for a pretty long time and it was only recently that an agreement was arrived at between the Hyderabad and Madras Governments in the matter

of sharing the water for irrigation purposes. The Government have sanctioned the scheme which is now under execution. The reservoir to be formed by constructing a dam at Mallapuram near Hospet is designed to have a capacity of 113,000 m.c.ft. and to irrigate at present about 3 lakhs of acres in Madras. Larger area on the Madras side can be irrigated when the final apportionment of waters has been made. Hydro-electric power will also be developed at two places along the canal. The project is estimated to cost about Rs. 17 crores at present prices. It is hoped that the spectre of famine in the Rayalaseema will vanish with the completion of the project in spite of the general deficiency of rainfall and the heavy black cotton soils in these parts. The Kurnool-Cuddapah canal which flows through a black cotton belt has not been successful though in years of deficient rainfall its water is eagerly sought after by the ryots for their crops.

2·08. South from Nellore we come to Chingleput where there are no major irrigation schemes, but about 450,000 acres are irrigated by as many as 653 tanks. The district is peculiarly suited to tank irrigation ; rainfall is generally favourable and the topography of the district favours this method of irrigation.

2·09. In South Arcot district also, there is a large number of tanks which irrigate over 300,000 acres. In addition, advantage has been taken of the fact that the district is traversed by two fairly large rivers, the Ponniar and the Vellar. An anicut across the Ponniar at Tirukkoyilur diverts sufficient water for about 30,000 acres. Regulators combined with road bridges have been built across the Vellar at Toludur, and the Shatiatope ; the former diverts water to Willingdon reservoir for over 25,000 acres (the ayacut is still expanding) and the latter diverts water through the Vellar Rajan channel and its branches to irrigate about 34,000 acres between Cuddalore and Porto Novo. Coleroon water is diverted at the Lower Anicut to irrigate about 118,000 acres in Chidambaram taluk. Besides, there are two anicuts at Vriddhachalam and Mehmattur across Manimutha nadhi, a branch of the Vellar, which irrigate about 10,000 and 5,000 acres respectively.

2·10. Deviating from the southerly course for a few moments, we meet the North Arcot, Salem and Coimbatore districts. The Palar river which rises in Mysore is the main feeder for North Arcot. Water is diverted through a series of canals and channels of the Palar anicut, 15 miles from Vellore, to irrigate over 100,000 acres. The district had many old tanks which have been retained and which now form an essential part of the system. Flow in the Palar is intermittent and in the old tanks the flood flow of the river is stored which without tanks would be wasted over the anicut. The Poiney anicut in the same district irrigates over 36,000 acres. The Cheyyar anicut also in the same district irrigates over 37,000 acres.

2·11. The Salem district is particularly not favoured by nature. The largest irrigation scheme in it is Barur. An anicut across the Ponniar diverts water to the Barur reservoir which irrigates over 7,000 acres. The district depends mainly on tanks many of which get a supply over and above that contributed by their own catchment through channels taking off from anicuts built across adjacent streams. Though Mettur Reservoir is in the district it has not been possible owing to very unfavourable conditions to devise any scheme to benefit Salem from this source. The Cauvery channel in Namakkal taluk irrigates 7,000 acres of very rich and fertile lands.

The Coimbatore district depends mainly on the Bhavani which irrigates at present a large area of paddy. There are in addition several tanks and the waters of the Chitrachavadi, the Noyel and the Amaravathi are also utilized to the greatest extent possible by means of anicuts.

2·12. Continuing the southerly route from South Arcot, Tanjore is reached. Irrigation of about 7·8 lakhs of acres has been practised in Tanjore for centuries and with the modern works recently built, the ayacut now is about nine lakhs of acres. The Cauvery-Mettur Project completed in 1934 is intended to ensure supply to the new delta as well as to extend irrigation by 301,000 acres in Pattukkottai, Mannargudi and Arantangi taluks. Tanjore has had a hoary tradition of irrigation works dating back to some 2,000 years. The benefits of Mettur reservoir to landholders in Tanjore delta are manifold. The reservoir acts as a flood moderator

and protects the Tanjore ryots from the ravages of the Cauvery floods in the south-west monsoon to which they were subject hitherto. It secures to the ryots the benefits of early supplies in June and ensures steady and regular flow throughout the irrigation season.

2·13. A part of the Tiruchirappalli district, like Tanjore, depends mainly on the Cauvery for its irrigation and prosperity. Many channels take off directly from the river to irrigate about 135,000 acres of fertile valuable lands.

2·14. A part of the Madurai benefits mainly from the Periyar project. A dam built across the Periyar river in Travancore holds up water in the Periyar lake and a tunnel 5,700 feet long, conveys this water to the Vaigai valley and thence to Madurai. One hundred and thirty-four thousand acres roughly are irrigated by the Periyar project. The difference that this scheme has made to the prosperity of Madurai district is enormous. The chief merit lies in its sociological effects on the population of the district. The Kallars and Maravars whose habits of life were none too helpful to the society have now settled down in peace and prosperity to tilling land and adding to the wealth of the country.

2·15. The Tirunelveli district, which adjoins Madurai, depends mainly on the Tambraparni river across which several anicuts have been built to irrigate about 75,000 acres. The irrigated portion of Tirunelveli is noted for its fertility.

2·16. In Tirunelveli, the Papanasam Hydro-Electric Scheme with a dam 170 feet high on the Tambraparni has been completed. Though the reservoir is formed mainly for power, it benefits irrigation also occasionally.

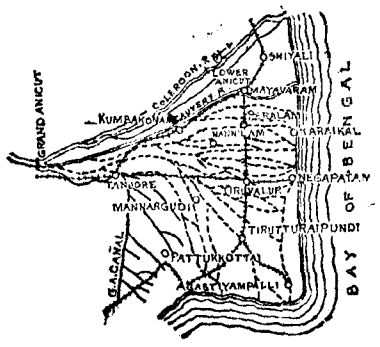
2·17. Tank irrigation is of the greatest importance in this Presidency where 2,670,000 acres are irrigated under tanks. Similarly, wells are another important source of supplies and are responsible for irrigation of about 1,540,000 acres. Attempts are being made to extend well irrigation by means of electric pumps in suitable areas.

Chapter III.

Brief description of important irrigation and navigation works.

3·01. *The Cauvery Delta System.*—The Cauvery rises in Coorg and flows for a considerable distance over the Mysore plateau. It then drops into the plains of Madras at the Hogainkal or Megadatu falls. The chief tributaries of the river are the Hemavathi, Lakshmanathirtha and Kabbini in Mysore and the Bhavani (rising in the Nilgiris) in Madras. The Cauvery is 500 miles long and drains 31,000 square miles. The river benefits by the south-west and north-east monsoons and irrigates a large area in Mysore before it enters Madras. There are two big reservoirs on the river—the Krishnarajasagara near Mysore and the Stanley Reservoir near Salem. Hydro-electric power is developed at Sivasamudram and at Stanley Dam at Mettur, at the former by utilizing the natural fall of the river and at the latter by utilizing the head due to storage at the dam.

3·02. Irrigation in the Cauvery Delta System is of great antiquity dating back to the ancient Hindu kings of Tanjore said to be about the second century B.C. The delta begins at the head of the Srirangam Island where the river divides into two, the right arm called the Cauvery carrying irrigation supplies and the left arm, the Coleroon being the flood carrier. There is a barrage with lift shutters—the Upper Anicut—across the Coleroon at its head to divert requisite supplies to the Cauvery over the Cauvery dam.



3·03. About 20 miles below the Cauvery dam is the Grand Anicut, an ancient masonry anicut built across a by-pass from the Cauvery into the Coleroon below the

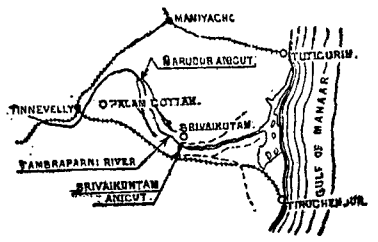
Srirangam Island. This anicut, intended to hold up and divert the normal flow of the Cauvery to the rivers supplying Tanjore delta, was converted into a regulator with lift shutters to permit effective disposal of surplus from the Cauvery and for passing supplies to the Lower Coleroon Anicut System.

3·04. At the Grand Anicut, the Cauvery branches into the Cauvery and the Vennar, which in turn throw off a number of branches and irrigate the fertile lands of the Tanjore delta, the well-known "Granary of South India." The new Grand Anicut canal of the Cauvery-Mettur Project also takes off at this point.

3·05. The delta is long, fertile and level, some 2,000 square miles in area with a seaboard over a 100 miles long extending from Point Calimere in the south to as far north as Porto Novo and some distance beyond to Cuddalore. It is served with a network of rivers and channels, supplies into which are controlled by several regulators. Many of the smaller rivers of the delta function both as irrigation and drainage channels.

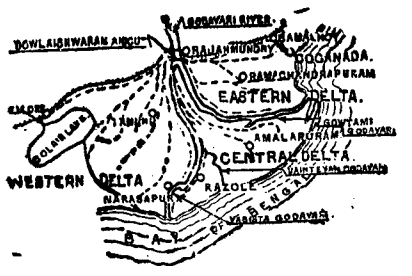
3·06. The area irrigated under the Cauvery Delta System alone is about 870,000 acres (first crop) and just over a million acres including the second crop. The value of the crops yielded is about Rs. 9·82 crores. Over 87 lakhs have been spent on improvements since the system was taken over from the Tanjore kings. The system yields a return of about 12·47 per cent on the capital outlay after giving credit for about 38 lakhs of rupees towards old revenue.

3·07. *Srivaikuntam Anicut System.*—The Srivaikuntam anicut is the last of the anicuts across the Tambraparni in Tirunelveli district. Two channels take off at the anicut. On the left is the North Main channel feeding a series of tanks and finally emptying into the Morumpallam tank. On the right side, the South Main channel takes off and supplies the large Kadamba tank and a series of tanks below it and irrigation under it extends as far as Tiruchendur with its famous temple on the seashore.



The system irrigates about 26,000 acres. The capital expenditure was about Rs. 17·75 lakhs and the return is 5·58 per cent on the outlay.

3·08. *The Godavari Delta System.*—The Godavari rises in the Western Ghauts within 50 miles of the Arabian sea and flows across the Peninsula for 900 miles before it falls into the Bay of Bengal. Its chief tributaries are the Manjira from Hyderabad and the Pranahita made up of three smaller streams from the Central Provinces, the Indravathi and the Sabari. Shortly after the Sabari joins it, the Godavari now deep and narrow winds its way through the spurts of the Eastern Ghauts and for 2 miles it flows through a picturesque gorge clothed with luxuriant tropical vegetation. Some distance below, it leaves the last ranges of the Ghauts, enters the plains at Polavaram and flows onward as a broad and shallow river until some distance below Rajahmundry where it divides into two main branches, the Gautami and the Vasishta Godavari rivers. Between the two arms lies the central delta, while the eastern and western deltas lie to the east and west of the two arms respectively. The two arms split up into branches, as they approach the sea, dividing the central delta into a number of islands. The river drains about 115,000 square miles and carries as much as 1½ million cubic feet per second in very high floods.



3·09. Prior to 1840, the Godavari district was frequently the scene of bad famines. In 1832–33, a terrible famine ravaged the district and the calamitous famine of 1840–41 followed after some more bad years. The recurring famines, the decreasing population and the dwindling revenue spurred the Government to action and Major Cotton (later Sir Arthur Cotton), who had just then completed great improvements in Tanjore, proposed the construction of an anicut across the Godavari at Dowlaishwaram with three canals, one for each of three deltas. The works were sanctioned almost immediately and carried out expeditiously under his guidance. It is to the genius, keenness and intrepidity of Sir Arthur Cotton, that Madras owes these monumental works unprecedented both as to type and magnitude and which have proved to be a veritable gold mine.

3·10. The Godavari anicut system consists of an anicut and three main canals irrigating three deltas. The anicut is in four sections, linking the islands in the broad river, the Dowlaishwaram section 4,839 feet long, the Ralli section 2,859 feet long, the Maddur section 1,550 feet long, and the Vazeswaram section 2,601 feet long. It was subsequently found necessary to raise the anicut slightly and fit up falling shutters, 2-feet high on the crest. In 1935, the 2-feet shutters were replaced by 3-feet shutters. The shutters which fall automatically during floods are lifted as the flood subsides by means of power-operated ploughs, so as to maintain the requisite water level in the river.

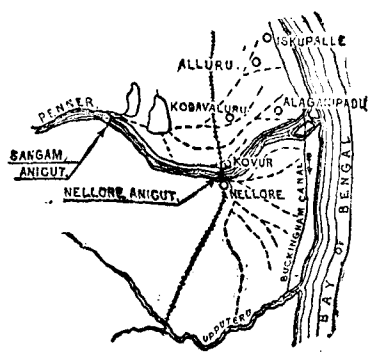
3·11. The headworks of the canals consist of a head sluice, and under sluice and a head lock for each of the three deltas. The eastern delta is about 450 square miles, the central delta 500 square miles, while the western delta about 1,000 square miles in extent stretches down to the Collair lake.

3·12. In the eastern and western deltas, the Samalkota and Eluru canals define the limits of irrigation to the areas enclosed between them and the River Godavari. They also form the link between Kakinada Port and Eluru town where the (Krishna) Eluru canal of the Krishna Delta System joins the (Godavari) Eluru canal. The central delta, particularly the "Nagaram" island, is the "Garden of the Godavari district" and is noted for the Gannavaram aqueduct which was completed in about eight months in the fifties of the last century, a remarkable feat due to Captain Orr. The Polavaram aqueduct at Annampalli is a similar recent construction to irrigate Polavaram island. The river and its branches are banked throughout to protect the deltas from the floods.

3·13. The net work of canals in all the deltas are navigable throughout their length for eleven months in the year and carry annually cargo valued at nearly Rs. 24·71 crores besides timber worth about Rs. 2·40 crores and passengers over a million a year.

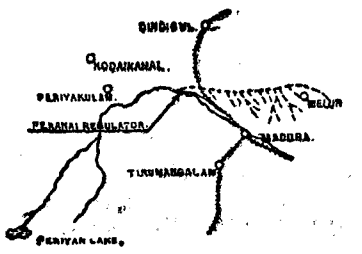
3 14. The canals irrigate about 820,000 acres but the total area irrigated during the year including the second-crop area is over 1 million acres. The value of crops grown is Rs. 11·77 crores. The capital outlay on the system is about Rs. 2·20 crores and the return is 18·22 per cent.

3·15. *Pennar River Canals System.*—The system consists of two anicuts, one at Sangam and the other at Nellore. Two canals take off at the Sangam anicut and the left, one to feed the Duvvur tank and the other the large Kanigiri tank, one of the largest tanks in the Circars. Another channel taking off at right side of the anicut feeds the Nellore tank. At the Nellore anicut about 20 miles down-stream of Sangam, a canal takes off on the right and feeds a number of tanks, the largest of which is the Sarvapalli tank. The Sangam anicut has recently been raised by 1 foot and with Nellore anicut system and they have been provided with two feet falling shutters. An extent of about 167,500 acres is being irrigated; the capital expenditure is Rs. 71 lakhs and the return is 5·88 per cent.

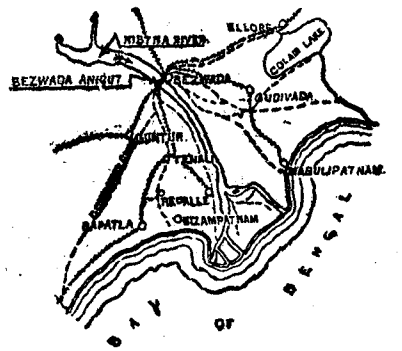


3·16. *The Shatiatope Anicut System.*—The system is a combined tank and canal system served by the Vellar Rajan channel taking off from the Shatiatope anicut across the Vellar. The old anicut was converted into a bridge and regulator fitted with lift shutters about 1906. The system irrigates about 33,000 acres in South Arcot district and irrigation extends almost as far east as Cuddalore. The Perumal tank is one of the largest tanks and is the terminal tank of the system. The capital expenditure on the system is about Rs. 11 lakhs and the return is 9·23 per cent.

3·17. *The Periyar System.*—The main feature of the Periyar System is the diversion across the Peninsula into the Bay of Bengal of a large river which nature had ordained should flow into the Arabian Sea. A huge dam across an inaccessible gorge in Travancore, about 3,000 feet above sea level, in malarial ridden jungle, forms a picturesque lake in the hills with a useful capacity of about 9,800 million cubic feet. The project is due to the genius of Colonel Pennycuick. The dam is of concrete with a masonry facing on the lake side about 170 feet high above river bed at the deepest point. A tunnel 5,700 feet long has been bored through the ridge on the east to carry the waters of the lake to the plains of Madurai. The water flows into the Suruliyar, tributary of the Vaigai, and after irrigating about 12,700 acres in the Suruliyar Valley, is again picked up at the Peranai regulator across Vaigai about 80 miles down-stream of the tunnel and diverted into the Periyar main canal about 35 miles long. The system irrigates about 143,000 acres in Madurai district. The capital expenditure on the system is about 108 lakhs and the return is about 6 per cent.



3·18. *The Krishna Delta System.*—The Krishna rises in the Western Ghauts near Mahabaleswar, some 4,000 feet above the sea level and runs southwards through the Bombay Presidency for some distance before it turns east into Hyderabad and receives the Bhima. Further down the Tungabhadra joins it and from here the river is for a considerable distance the boundary between Madras and Hyderabad. The last important tributary to join is the Musi. The river after flowing through a narrow gorge in the Nallamalais enters the plains of the Coromandal coast studded with hills. The last of the three hills is at Vijayavada where the river flows between two of them hardly 6 furlongs apart. Stretching away on both sides of the river beyond Vijayavada lie the two sections of the delta, the eastern delta lying on the left side and the western delta lying on the right. For 40 miles below the river runs in a single stream. It then throws out the Puligedda branch. Between this and the main river lies the Divi island. The main river then flows for 15 miles and splits into three branches before it empties into the sea. The river drains 97,000 square miles and its flood discharge is about a million cubic feet per second.



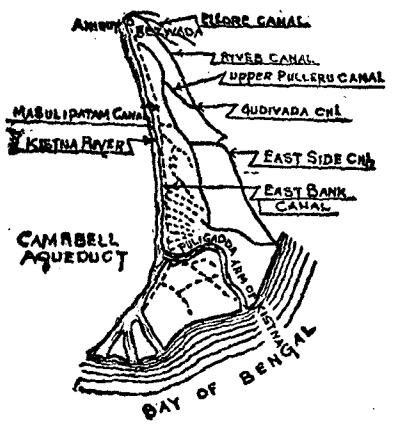
3·19. The history of the Krishna anicut follows almost the same course as that of the Godavari. Sir Arthur Cotton, who built the Godavari anicut, was again

responsible for the anicut at Vijayavada with its two canals, supplying the two sections of the delta on either bank of the river.

3·20. The anicut is about 6 furlongs in length; its crest was raised at a later date by one foot and fitted with 3 feet falling shutters to improve the supplies to the delta. In 1935 even this was found insufficient and 6 feet falling shutters were substituted. The shutters are tripped by hydraulic pressure to pass floods and a steam plough is used to lift them up as the flood subsides. The headworks of each canal consist of head and under sluice and a head lock.

3·21. The eastern delta has an area of about 1,160 square miles and stretches as far north as the Collair. The western delta is about 950 square miles and extends to the south as far as Pedda Ganjam. The Krishna-Eluru canal in the eastern delta connects the Godavari-Eluru canal in the north and the Commamur canal of the western delta joins the Buckingham canal in the south. These contour canals and the interior canals form a net-work of irrigation and navigation canals affording means of irrigation and transport for the two deltas. The Divi island was irrigated with water pumped from the river by diesel engine driven pumps. Pumping from the river was the practice till 1935 when the Campbell aqueduct was built at Puligedda to carry the Krishna East Bank canal across the river to Divi. This canal now irrigates by direct flow the entire ayacut in the Divi island.

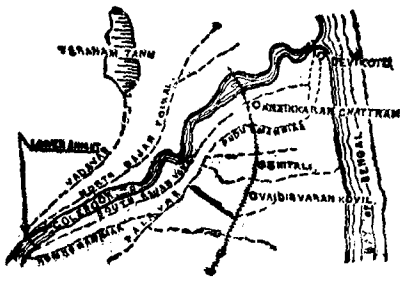
3·22. The Krishna East Bank canal takes off at about mile 4/0 of the Masulipatnam canal. The canal is navigable and runs alongside the river for a considerable distance before it crosses the Puligedda arm of the Krishna river by the Campbell aqueduct. The aqueduct is the longest reinforced concrete aqueduct bridge in India and carries a roadway 16 feet wide and a footpath 4 feet wide. The aqueduct is submersible during the high floods. The capital expenditure on the canal is Rs. 58 lakhs and the return is 7·76 per cent.



3·23. The river and its arms forming the Divi island are banked to protect the delta from floods.

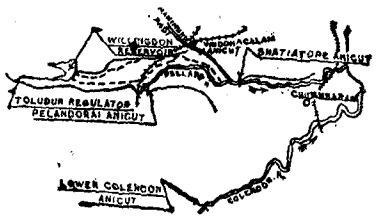
3·24. The canals are navigable for about 10 months in the year and carry annually cargo valued at about Rs. 16·35 crores, timber worth about Rs. 44·59 lakhs and over 2 lakhs of passengers. The system irrigates about 10 lakhs acres excluding the Krishna East Bank canal. The value of the crops grown is about Rs. 12 crores. The capital expenditure is Rs. 2·28 crores and the return is 16·20 per cent.

3·25. *Lower Coleroon Anicut System.*—The lower anicut across the Coleroon was built about 1840 by Sir Arthur Cotton to ensure supply to the areas originally irrigated by river channels. The old works were substantially improved in 1906. The weir was converted into a regulator of 70 vents fitted with lift shutters 33 feet 4 inches span and 8 feet high. The Vadavar and North Rajan channels taking off on the left side irrigate lands in the Chidambaram taluk of the South Arcot district. The Kumikimanniyar and South Rajan channels take off on the right and irrigate lands in the Shiyali taluk of the Tanjor district



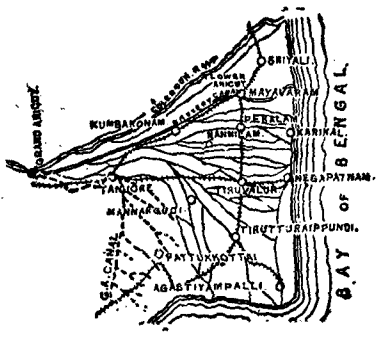
The Vadavar is a contour canal supplying the large Veeranam tank, which also supplements supplies in the river valleys through a sluice at its northern end. The system irrigates about 118,700 acres. The capital expenditure is Rs. 30 lakhs and the return is 9·17 per cent.

3·26. *Willingdon Reservoir.*—Originally known as the Toludur Project is a comparatively new work in South Arcot district opened in 1923. There is a bridge and regulator fitted with lift shutters across the Vellar at Toludur from which a canal three and a half miles long takes off and feeds the reservoir which has a capacity of about 2,400 million cubic feet. The bridge carries the Great Southern Trunk Road from Madras to Tiruchirappalli. From the reservoir, a channel takes off and branches into the high and low level channels a short distance below the head. The system now irrigates about 25,000 acres. The capital expenditure on the system is about Rs. 26 lakhs and the return is 2·71 per cent.



3·27. *Polavaram Island System.*—The system consists of a canal taking off the Bank Canal of the Godavari Central delta about half a mile above Annampalli lock. The canal exceeds the Vriddha Goutami by a masonry aqueduct and irrigates the Polavaram island enclosed by the two branches of the Goutami Godavari. The system irrigates about 17,500 acres in East Godavari district. The capital expenditure is about Rs. 17 lakhs and the return is 5·5 per cent.

3·28. *Cauvery-Mettur System.*—While the south-west monsoon in the hills is fairly heavy and dependable, the north-east monsoon supplies to the Cauvery are irregular. The caprices of the north-east monsoon have frequently affected cultivation in Tanjore. Moreover, there is usually a break of about six weeks between the two monsoons during which period the supply in the river is very low and insufficient for irrigation requirements. The chief aim of the Cauvery-Mettur system is to remedy this state of affairs by storing the excess water during floods and passing it down later when the natural flow in the river falls below requirements. It is also intended to irrigate 301,000 acres of new land chiefly in the Mannargudi, Pattukkottai and Arantangi taluks of the Tanjore district.



3·29. The system consists of a large reservoir at Mettur known as the Stanley reservoir and a canal known as the Grand Anicut canal in Tanjore taking off above the Grand Anicut.

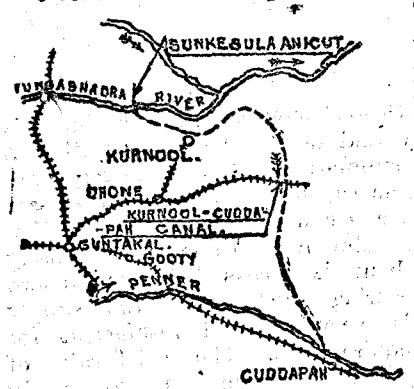
3·30. The Stanley reservoir has a waterspread 60 square miles in area and holds 93,500 million cubic feet of water when full. The lake is formed by a masonry dam across the valley of the Cauvery. It is 5,300 feet long and 214 feet high at the deepest point. It is almost the biggest dam in the world and costs Rs. 4·8 crores.

There are two sets of sluices in the dam, the high and low level sluices with sills at + 720 and + 670 while the F.R.L. is + 790 and the M.W.L. is 796·00. The river floods are surplussed over an escape at the left flank fitted with lift shutters 60 feet long and 20 feet high and an emergency escape at the right flank. The design however provides for raising these by 10 feet high if it becomes necessary. The sluices and the surplus shutters are worked by electric power but it is possible to work any of them by hand if required. The dam also incorporates four sets of cast iron lined sluices 8 feet 6 inches diameter. These enable supplies to be drawn for the development of hydro-electric power below the dam and a hydro-electric power station has been built below the dam and is in operation since 1937. Irrigation supplies for the new area under the reservoir are passed into the river below the dam and picked up at the Grand Anicut about 120 miles downstream. The new canal called the Grand Anicut canal is a contour canal about 70 miles long has costed about Rs. 200 lakhs. It runs through Tanjore town, after passing which it throws out the large Kalianodai and Rajamadam branch canals. Down below there is a network of branch channels and the system irrigates lands as far south as the Narasingha Cauvery and beyond.

3·31. The system is under development. It now irrigates about 332,000 acres. The capital outlay is Rs. 6·5 crores and the present rate of return on capital is 1·54 per cent.

3·32. *Kattalai System.*—The South Bank canal was excavated to replace the four old korambu channels—Marudur nattu voikal, Mahadanapuram channel, Nangam channel and Uyyakondan channel taking off from the right bank of the Cauvery in Tiruchirappalli district, as irrigation under them was troublesome and uneconomical. Because the river-bed at the head of the South Bank canal had been badly scoured by the 1924 floods a bed regulator was constructed there. Five furlongs below its head, the canal divided into the High Level channel and the South Bank channel. The system irrigates about 67,000 acres. The capital expenditure was about Rs. 41 lakhs and return is 3·75 per cent.

3·33. *Kurnool-Cuddapah canal.*—The Kurnool-Cuddapah canal takes off from the Tungabhadra from an anicut at Sunkesula about 15 miles upstream of Kurnool. The anicut and canal were constructed by the Madras Irrigation and Canal Company, Limited, incorporated in England in 1858 with a guarantee of 5 per cent interest on outlay. The work was completed about 1870 and was handed over to Government on payment of Rs. 3·02 crores. The canal provided for irrigation of 76,500 acres in Kurnool and Cuddapah districts but the irrigated area varies within wide limits from year to year. The canal runs parallel to the river for about 50 miles when it takes a turn southwards towards Cuddapah district and pierces the ridge between Pennar and Krishna valleys through a cutting called Mittakondala cutting. Below this point the Kali and Kundu rivers are utilized to carry the irrigation supplies, the canal serving mainly as navigation canal. There are anicuts across the Kundu river at Santhajuttur and at Rajoli at which the canal supplies are again picked up and used for irrigation in the Kurnool-Cuddapah canal and its branches. At about mile 180, the canal crosses the Pennar at Adinimayapalli anicut and is continued on the right as far as Cuddapah town. The Kurnool-Cuddapah canal flows through black cotton soil and irrigates mostly dry crops. These crops do not require canal supply in years of good and well-distributed rainfall but in other years they require occasional irrigation. The canal is maintained at a heavy and recurring loss particularly because of its use in famine years. The canal was navigable throughout till 1934 when the reach below Lockinsula at mile 74/0 was closed to navigation, as there was little boat traffic, and costly replacement of a number of lock gates below Lockinsula was found involved.



3·34. The capital expenditure on the canal is about Rs. 234 lakhs and the return is about 0·67 per cent. It is the most expensive project (excluding Cauvery-Mettur Project) in Madras.

3·35. *Barur Tank System.*—The system consists of an anicut across the Ponniar at Nedungal, with a supply channel feeding the Barur tank in Salem district. The supply channel also feeds a number of small tanks on the left bank while the two old channels, the Nedungal and Agaram channels, feed small tanks on the right bank.

3·36. The work on the tank and the supply channel was commenced as a famine relief work in 1877 and subsequently revised to include the anicut, etc. The work was completed in 1899. The system irrigates an area of about 7,000 acres.

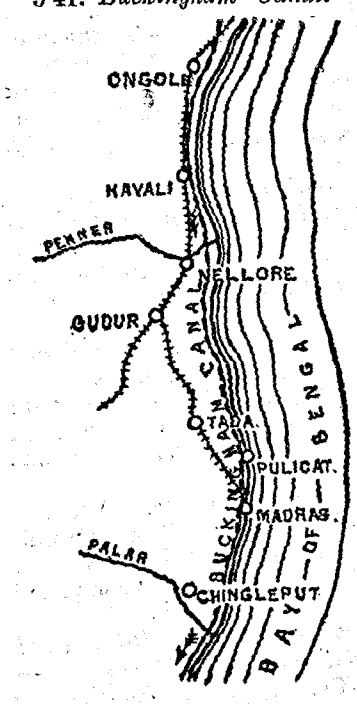
3·37. The capital expenditure is Rs. 4·5 lakhs and a return of 3·42 per cent is now obtained.

3·38. *Nagavalli River System.*—At Thottapalli in Visakhapatnam district a regulator has been built across the Nagavalli river and a channel about 22 miles long has been dug. The channel irrigates about 27,900 acres. The capital expenditure is about Rs. 18 lakhs return being about 2·30 per cent.

3·39. *Bhavanasi Tank.*—This is a reservoir formed by an earthen bund about 2,500 feet long and 30 feet high across the Bhavanasi river in Guntur district with a capacity of about 175 million cubic feet. The reservoir irrigates about 700 acres. The capital expenditure is Rs. 2·65 lakhs and the return is 0·31 per cent.

3·40. *Mopad System.*—The Mopad system consists of a reservoir with an earthen bund about 70 feet high at the deepest point and more than a mile long, built across the Manneru river in Nellore district. The reservoir has a capacity of about 2,100 million cubic feet and irrigates lands in a tract where famines are frequent. The system irrigates about 7,000 acres The capital expenditure on the system is about Rs. 24 lakhs and the return is 0·61 per cent.

3·41. *Buckingham Canal.*—This canal is used entirely for navigation. It runs through Madras parallel and close to the Coromandel coast, joining up a series of natural backwaters and connects all the coastal districts with Guntur and South Arcot at the ends. The canal runs for 196 miles north of Madras and 62 miles south of Madras. At its northern end it is connected with the Commamur canal at the Krishna delta which in turn is connected to the Godavari canals running as far north as Kakinada. Due to its alignment close to the coast, the canal is difficult and costly to maintain. The navigability of the north canal is difficult and costly to maintain. The navigability of the north canal depends on the open sea bars at Ennore and Pulicat. In a bad year, water levels may drop and lead to considerable difficulty in navigation. The canal carries a large traffic in salt, shells, firewood, building materials and foodgrains and is one of the main feeders to the Madras market. It carries cargo of an estimated value of about Rs. 20·73 crores and about 98,000 passengers every year. The capital expenditure on the system is Rs. 95·72 lakhs and the return is minus 6·01 per cent.



Chapter IV.

IMPORTANT WORKS CARRIED OUT DURING THE YEAR.

4·001. The important works under execution are enumerated below under the categories Grow More Food and other works along with particulars of expenditure and ayacut.

Works for which Capital and Revenue Accounts are kept.

Cauvery Delta System—*A. Grow More Food works*—4·002. *Extending irrigation under tail end of Mulliyar by gravitation*—(*Estimate Rs.* 70,000 *for works and Rs.* 91,700 *including Direct and Indirect charges*).—Ayacut to be benefited: 1,128 acres. The expenditure incurred on the work during the year and to the end of the year was Rs. 9,811 and Rs. 77,308 respectively. The whole work was completed in all respects and brought into beneficial use.

4·003. *Extension of irrigation under Mulliar pumping scheme*—(*Estimate Rs.* 1,67,200 *for works and Rs.* 2,17,540 *including Direct and Indirect charges*).—Ayacut to be benefited: 1,420 acres. The expenditure incurred on the work during the year and to the end of the year was Rs. 1,42,333 and Rs. 2,20,372 respectively. The work was completed except a few items. Programme for 1952-53, Rs. 5,000.

4·004. *Providing irrigation facilities to Kudithangicheri village*—(*Estimate Rs.* 1,00,000 *for works and Rs.* 1,30,210 *including Direct and Indirect charges*).—Ayacut to be benefited: 688 acres (existing). The work is only an improvement to the drain and the ayacut to be additionally benefited is nil. The expenditure incurred on the work during the year and to the end of the year was Rs. 80,909 and Rs. 99,034 respectively. The work was completed except a few items. Programme for 1952-53, Rs. 4,000.

4·005. *Providing direct source of supply to Pudu Manniar from Cauvery*—(*Estimate Rs.* 1,30,000 *for works and Rs.* 1,69,140 *including Direct and Irrigati charges*).—Ayacut to bebenefited: 2,000 acres existing. The expenditure incurred on the work during the year and to the end of the year was Rs. 80,701 and Rs. 1,00,628 respectively. The work was completed and brought into beneficial use.

4·006. *Improvements to Bheeman channel of Manniar*—(*Estimate Rs.* 70,600 *for works and Rs.* 91,856 *including Direct and Indirect charges*).—Ayacut to be benefited: 361 acres. The three dams and 25 per cent of earthwork in channel excavation was done. Due to objection raised by mutt authorities further work could not be proceeded with. The expenditure incurred on the work during the year and to the end of the year was Rs. 27,123 and Rs. 27,994 respectively. Programme for 1952-53 Rs. 6,300.

4·007. *Improvements to Bheeman odai drain*—(*Estimate Rs.* 39,400 for *works and Rs.* 52,480 *including Direct and Indirect charges*).—The proposal is to deepen and widen the existing drain and to relieve submersion trouble for 449 acres. Expenditure incurred on the work during the year and to the end of the year was Rs. 13,594 and Rs. 13,938 respectively. The work was in progress. Programme for 1952-53, Rs. 20,000.

4·008. *Providing irrigation facilities to 320 acres of lands in Segal and Deevambalpatnam village pumping scheme*—(*Estimate Rs.* 27,000 *for works and Rs.* 31,950 *including Direct and Indirect charges*).—Ayacut to be benefited: 305 acres (new) and 50 acres (existing). The expenditure incurred on the work during the year and to the end of the year was Rs. 40,343. The work was completed in all respects.

4·009. *Improvements to Sammandan Cauvery*—(*Estimate Rs.* 80,300).—Ayacut to be benefited: 63 acres (new) and 2,244 acres (existing). The expenditure incurred on the work during the year and to the end of the year was Rs. 44,366 and Rs. 88,827 respectively. The work was practically completed except a few petty items.

B. Other works—4·010. *Drainage improvement to Cauvery Delta (XII Key schemes)*—[*Estimate (including special revenue establishment), Rs.* 29·63 *lakhs*].—The expenditure incurred during the year was Rs. 17,59,790. All the key schemes except scheme V were completed. Regarding scheme V, an amount of Rs. 10,000 was provided in the Budget Estimate for 1952-53.

Tirukkoyilur Anicut System—*A. Grow More Food works*—4·011. *Providing falling shutters 2′ at either end of Tirukkoyilur Anicut*—(*Estimate Rs.* 67,000 *for works and Rs.* 87,172 *including Direct and Indirect charges*).—Ayacut to be benefited: 22,325 acres. The expenditure incurred on the work during the year and to the end of the year was Rs. 8,398 and Rs. 27,625 respectively. The work at the right side was completed and in the left side was in progress. Programme for 1952-53, Rs. 8,900.

4·012. *Excavating a supply channel to Malavarayanallur*—(*Estimate Rs.* 11,000 *for works and Rs.* 12,137 *including Direct and Indirect charges*).—Ayacut to be benefited: 91 acres. The expenditure incurred on the work during the year and to the end of the year was Rs. 441 and Rs. 3,186 respectively. The work was completed except for payment of land charges. Programme for 1952-53, Rs. 700 for land charges.

Shatiatope Anicut System—*A. Grow More Food works*—4·013. *Providing irrigation facilities to a block of lands in Mutlur village—Extension of Bhuvanagiri voikal*—(*Estimate Rs.* 19,000 *for works and* Rs. 24,720 *including Direct and Indiret charges*).—Ayacut to be benefited: 243 acres. The expenditure incurred on the work during the year and to the end of the year was Rs. 7,527. The construction of head sluice and syphon was completed and excavation of channels below, syphon was in progress. Programme for 1952-53. Rs. 9,000.

B. Other works—4·014. *Extending weir No. I and providing additional surplus arrangements to Wallajah tank*—(*Estimate Rs.* 10,450).—The expenditure incurred on the work during the year and to the end of the year was Rs. 72 and Rs. 8,658 respectively. The work was completed in all respects.

Lower Coleroon Anicut System—*A. Grow More Food works.*—4·015. *Providing irrigation facilities to a block of lands in Ponnanthittu village*—(*Estimate Rs.* 46,000 *for works and Rs.* 59,489 *including Direct and Indirect charges*).—Ayacut to be benefited; 351 acres. The expenditure incurred on the work during the year and to the end of the year was Rs. 6,983 and Rs. 32,820 respectively. The work was completed except the drainage outlet at tail end which was in progress. Programme for 1952-53, Rs. 18,800.

4·016. *Providing irrigation facilities to land in Allur and Budangudi villages*—*Estimate Rs.* 57,600 *for works and Rs.* 74,942 *including Direct and Indirect charges*).—Ayacut to be benefitted: 594 acres. The expenditure incurred on the work during the year and to the end of the year was Rs. 6,467 and Rs. 25,048 respectively. The work was completed in all respects except for land acquisition. Programme for 1952-53, Rs. 23,500 to meet land acquisition charges.

4·017. *Constructing a sluice at M.* 1-2-50 *of Veeranam tank bund*—*Estimate Rs.* 14,400 *for works and Rs.* 18,735 *including Direct and Indirect charges*).—Ayacut to be benefited: 360 acres, The expenditure incurred on the work during the year and to the end of the year was Rs. 34 and Rs. 9,091, respectively. The work was completed in all respects except for land acquisition. Programme for 1952-53, Rs. 4,200 for land charges.

4·018. *Provision of irrigatian and drainage facilities to lands in Kalladai-cuttai, Kattagaram and Veerandapuram villages*—(*Estimate Rs.* 1,35,000 *for works and Rs.* 1,77,677 *including Direct and Indirect charges*).—Ayacut to be benefited: 550 acres. The expenditure incurred on the work during the year and to the end of the year was Rs. 5,618. The construction of head sluice was completed and the excavation of the channel was in progress in third and fourth reaches. Programme for 1952-53, Rs. 10,000.

Cauvery-Mettur Project—*A. Grow More Food works.*—4·019. *Improvements to Illivoikal and seven other drains—Estimate Rs.* 6,02,700 *and Rs.* 8,63,000 *including Direct and Indirect charges*).—Ayacut to be benefited: 1,250 acres (new) and 3,110 acres (old). The expenditure incurred on the work during the year and to

the end of the year was Rs. 8,997 and Rs. 5,24,763 respectively. The main item of the work that was carried out during the year was the construction of the bridge across Vadapuriyar drain. The improvements to Vallamvari upper reach is the only item of work remaining to be done. Programme for 1952–53, Rs. 100.

4·020. *Extension of irrigation beyond Narasinga Cauvery*—(*Estimate Rs.* 19,30,000 *for works and Rs.* 25,30,000 *including Direct and Indirect charges*).—Ayacut to be benefited: 15,000 acres. The main scheme works were completed in 1950–51. During the year several distributories were excavated and the masonries in the distributories were constructed. The expenditure incurred on the work during the year and to the end of the year was Rs. 18,767 and Rs. 13,37,523, respectively. Programme for 1952–53, Rs. 10,500.

4·021. *Extension of Olavayal channel*—(*Estimate Rs.* 8,00,500 *for works and Rs.* 10,41,510 *including Direct and Indirect charges*).—Ayacut to be benefited: 6.300 acres (new) and 1,278 acres (existing). The first stage of the scheme was completed and brought under beneficial use. Excavation of the main channel for second stage was started and was in progress. Expenditure incurred during the year and to the end of the year was Rs. 2,18,732 and Rs. 3,15,887, respectively. Programme for 1952–53, Rs. 2,99,000.

4·022. *Providing irrigation facilities to Pudukkottai enclaves surrounded by Alivalam channel*—(*Estimate Rs.* 18,000 *for works and Rs.* 23,419 *including Direct and Indirect charges*).—Ayacut to be benefited: 243 acres. The proposal is to give irrigation facilities from Alivalam channel to lands belonging to former Pudukkotah State. The expenditure incurred on the work during the year and to the end of the year was Rs. 4·808. The work was in progress. Programme for 1952–53, Rs. 7,900.

4·023. *Excavating a separate drain from the deep bed of Araseri tank*—(*Estimate Rs.* 21,500 *for works and Rs.* 27,973 *including Direct and Indirect charges*—Ayacut to be benefited: 170 acres (existing) and 80 acres (new). This scheme is intended to bring under cultivation a portion of Araseri tank bed and to relieve submersion to adjacent lands. The expenditure incurred on the work during the year and to the end of the year was Rs. 524. The work was in progress. Programme for 1952–53, Rs. 18,500.

Kattalai Project System—4·024. *Clubbing the sluices and bed dams in South Bank Canal*—(*Estimate Rs.* 60,000).—The expenditure incurred on the work during the year and to the end of the year was Rs. 355 and Rs. 41,089, respectively. Five dams were completed and the sixth dam was dropped.

4·025. *Supplementing supply to Sayakudi and four other rainfed tanks in Tanjore from Uyyakondan extension channel*—(*Estimate Rs.* 40,700 *for works and Rs.* 52,912 *including Direct and Indirect charges*).—Ayacut to be benefited: 463 acres. The scheme is to provide supply from Uyyakondan extension channel to the ayacut of rainfed tank of Sayakudi and other villages in Tanjore district. The expenditure incurred on the scheme during the year and to the end of the year was Rs. 10,126. The work was in progress. Programme for 1952–53, Rs. 24,700.

Ponniar Scheme—4·026. *Construction of Anicut across Ponniar near Ellis Choultry*—(*Estimate Rs.* 16,32,833).—Ayacut to be benefited: 870 acres (new), 13,000 acres (existing I crop). The expenditure incurred on the work during the year and to the end of the year was Rs. 24,642 and Rs. 11,56,193 respectively. The main works were completed except land acquisition. Programme for 1952–53, Rs. 50,000.

Godavari Delta System—*A. Grow More Food works.*—4·027. *Providing irrigation facilities to Kannur, etc., villages*—(*Estimate Rs.* 10,95,100).—Ayacut to be benefited: 2,831 acres (existing) and 3,334 acres (of new ayacut). The expenditure incurred on the work during the year and to the end of the year was Rs. 2,49,587 and Rs. 4,30,330, respectively. The work was in progress. Programme for 1952–53, Rs. 1,49,100.

4·028. *Providing irrigation facilities to dry lands of Undrajavaram and Chivattem villages*—(*Revised Estimate Rs.* 35,000) *for works and Rs.* 46,490 *including Direct and Indirect charges*).—Ayacut to be benefited: 503 acres. The expenditure incurred on the work to the end of the year was Rs. 12,995. The work was completed.

4·029. *Providing irrigation facilities to waste lands of Lakshmaneswaram Block No. I*—(*Estimate Rs.* 15,360).—Ayacut to be benefited: 96 acres and 414 acres of new ayacut. The expenditure incurred on the work during the year and to the end of the year was Rs. 4,779 and Rs. 9,805 respectively. The work was in progress.

4·030. *Providing irrigation facilities to Vemuladevi village Blocks Nos. 3 and 4*—(*Estimate Rs.* 72,045).—Ayacut to be benefited: 598 acres. The expenditure incurred on the work during the year and to the end of the year was Rs. 49,768 and Rs. 76.221 respectively. The work was nearing completion.

4·031. *Providing irrigation facilities to waste lands of Dodanapudi, etc., villages under Kolanapalli Lanka channel*—(*Estimate Rs.* 1,19,000).—Ayacut to be benefited: 502 acres existing and 5,001 acres of new ayacut. The expenditure incurred on the work during the year and to the end of the year was Rs. 36,918 and Rs. 79,937 respectively. The work was in progress. Programme for 1952–53 Rs. 8,000.

4·032. *Providing irrigation facilities to certain dry lands in Devarapalli and Kothapetta villages*—(*Estimate Rs.* 67,600).—Ayacut to be benefited: 592 acres. The expenditure incurred on the work during the year and to the end of the year was Rs. 21,319 and Rs. 21,719 respectively. The work was in progress. Programme for 1952–53, Rs. 16,700.

4·033. *Providing irrigation facilities to the dry lands in Gangalakurru village*—(*Estimate Rs.* 63,950).—Ayacut to be benefited: 652 acres. The expenditure incurred on the work during the year and to the end of the year was Rs. 15,969 and Rs. 65,252 respectively. The work was in progress. Programme for 1952–53, Rs. 12,400.

4·034. *Providing irrigation facilities to the dry and high level lands in Kothalanka village in Amalapur taluk*—(*Estimate Rs.* 1,28,985).—Ayacut to be benefited: 1,443 acres. The expenditure incurred on the work during the year and to the end of the year was Rs. 41,838 and Rs. 47,071 respectively. The work was in progress. Programme for 1952–53, Rs. 45,000.

4·035. *Providing separate source for Vadaparu supply channel*—(*Estimate Rs.* 73,396).—Ayacut to be benefited: 3,005 acres. The expenditure incurred on the work during the year and to the end of the year was Rs. 35,993 and Rs. 36,305 respectively. The work was in progress. Programme for 1952–53, Rs. 22,000,

4·036. *Improvements to Annakoderu channel*—(*Estimate Rs.* 79,000).—Ayacut to be benefited: 445 acres and 975 acres of new ayacut. The expenditure incurred on the work during the year and to the end of the year was Rs. 34,434 and Rs. 54,148 respectively. The work was in progress. Programme for 1952–53, Rs. 28,000.

4·037. *Providing irrigation facilities to waste lands in the tail-end of Chellangi and Gorripudi channels*—(*Estimate Rs.* 23,260).—Ayacut to be benefited, 445 acres. The expenditure incurred on the work during the year and to the end of the year was Rs. 1,041 and Rs. 11,609 respectively. The work was in progress and is expected to be completed during 1952–53. Programme for 1952–53, Rs. 3,000.

4·038. *Improving pipes to irrigate an extent of 262·86 acres—Lakshmaneswaram Block No. II*—(*Estimate Rs.* 61,150).—Ayacut to be benefited, 640 acres of new ayacut. The expenditure incurred on the work during the year and to the end of the year was Rs. 24,017. Programme for 1952–53, Rs. 9,000.

4·039. *Providing irrigation facilities to waste lands of L.B. Cherla, etc., Block No. VI*—(*Estimate Rs.* 3,23,000).—Ayacut to be benefited, 3,021 acres of new ayacut. The expenditure incurred on the work during the year and to the end of the year was Rs. 1,49,201 and Rs. 1,59,406 respectively. The work was in progress. Programme for 1952–53, Rs. 85,000.

4·040. *Providing Irrigation facilities to R.S. No.* 460 *of Mutyalapalli village by extending Komatitippa and Naditippa channels*—(*Estimate Rs.* 13,100).—Ayacut to be benefited: 133 acres. The expenditure incurred on the work during the year and to the end of the year was Rs. 1,602 and Rs. 11,327 respectively. The work was almost completed except fixing of R.C. pipes.

4·041. *Providing a supplemental source of supply to Relangi channel*—(*Estimate Rs.* 35,900 *for works aud Rs.* 43,800 *including Dirct and Indirect charges*).—The expenditure incurred on the work during the year and to the end of year was Rs. 19,994. The work was started and in progress. Programme for 1952–53, Rs. 8,000.

4·042. *Constructing an under-tunnel at mile* 8/3 *of Agada lanka channel*—(*Estimate Rs.* 1,15,500 *for works and Rs.* 1,50,300 *including Direct and Indirect charges*).—The expenditure incurred on the work during the year and to the end of the year was Rs. 25,060. The work was in progress. Programme for 1952–53, Rs. 1,11,700.

4·043. *Excavating a straight cut from the tail-end of Polimeratippa drain to Upputeru*—(*Estimate Rs.* 47,700 *for works and Rs.* 61,465 *including Direct and Indirect charges*)).—The expenditure incurred on the work during the year and to the end of the year was Rs. 7,125. The work is programmed to be completed during 1952–53 and was nearing completion. Programme for 1952–53, Rs. 33.000.

4·044. *Providing irrigation facilities to certain dry lands in Panangipalli and Satyavada villages*—(*Estimate Rs.* 15,320).—Ayacut to be benefited: 329 acres. The expenditure incurred on the work during the year and to the end of the year was Rs. 63 and Rs. 4,336 respectively. The work was almost completed except land acquisition.

4·045. *Providing irrigation facilities to the dry lands of Tekki village*—(*Estimate Rs.* 33,600).—Ayacut to be benefited: 445 acres. No expenditure was incurred on the work during the year due to curtailment of grants. Programme for 1952–53, Rs. 11,000.

4·046. *Corringa island project at Tallarevu*—(*Estimate Rs.* 12,96,000 *for works and Rs.* 16,93,122 *including Direct and Indirect charges*).—Ayacut to be benefited, 6,600 acres. The formation of coffer-dam completed and excavation of syphon wells was done up to — 6·00. The expenditure incurred on the work during the year and to the end of the year was Rs. 1,99,388 reinforced concrete pipe driving, construction of head sluice and excavation of Coringa main canal were in progress. Programme for 1952-53, Rs. 6,50,000.

B. Other works—4·047. *Remodelling and providing a reinforced concrete bridge over the vents of Gannavaram aqueduct*—(*Estimate Rs.* 26,60,000).—The expenditure incurred on the work during the year and to the end of the year was Rs. 740 and Rs. 22,48,445 respectively. Construction of a foot path bridge has to be taken up. Programme for 1952–53, Rs. 20,000.

Krishna Delta System—*A. Grow More Food works*—4·048. *Providing irrigation facilities to Kona block*—(*Estimate Rs.* 1,70,400).—Ayacut to be benefited, 1,367 acres. The expenditure incurred on the work during the year and to the end of the year was Rs. 1,682 and Rs. 1,07,990, respectively. The work was completed and land acquisition charges will have to be paid. Programme for 1952–53, Rs. 6,200.

4·049. *Providing irrigation facilities to Bhavadevarapalli block*—(*Estimate Rs.* 1,42,660).—Ayacut to be benefited. 1,182 acres. The expenditure incurred on the work during the year and to the end of the year was Rs. 17,038 and Rs. 80,421 respectively. The work was completed. Land acquisition charges have to be paid. Programme for 1952–53, Rs. 2,500.

4·050. *Providing irrigation facilities to Etimoga block*—(*Estimate Rs.* 1.36,370).—Ayacut to be benefited, 773 acres. The expenditure incurred on the work during the year and to the end of the year was Rs. 7,248 and Rs. 73,046 respectively. The work was completed. Land acquisition charges have to be paid. Programme for 1952–53, Rs. 1,500.

4·051. *Providing irrigation facilities to Gollapalem block*—(*Estimate Rs.* 1,61,520.)—Ayacut to be benefited, 1,010 acres. The expenditure incurred on the work during the year and to the end of the year was Rs. 41,815 and Rs. 54,568 respectively. The work was almost completed except fixing up of pipes in masonry and payment of land acquisition charges. Programme for 1952–53, Rs. 40,000.

4·052. *Providing irrigation facilities to Hamasaladivi block*—(*Estimate Rs.* 55,400).—Ayacut to be benefited, 568 acres. The expenditure incurred on the work during the year and to the end of the year was Rs. 33,574 and Rs. 39,597 respectively. Construction of pipe sluice, improvements to East Channel and construction of culverts, etc. Works remain to be done. Programme for 1952–53, Rs. (—) 12,000.

4·053. *Providing irrigation facilities to Talagedadivi block*—(*Estimate Rs.* 2,39,400).—Ayacut to be benefited, 2,088 acres. The expenditure incurred on the work during the year and to the end of the year was Rs. 96,365 and Rs. 1,04,861 respectively. Fixing of pipes in masonry, construction of a tail-dam and revetment of works are to be completed. Programme for 1952–53, Rs. 41,000.

4·054. *Providing irrigation facilities to Ghantasala block*—(*Estimate Rs.* 3,93,473).—Ayacut to be benefited, 3,051 acres. The expenditure incurred on the work during the year and to the end of the year was Rs. 40,000 and Rs. 40,184 respectively. The work was in progress. Programme for 1952–53, Rs. 1,37,000.

4·055. *Providing irrigation facilities to Pittallanka block*—(*Estimate Rs.* 37,112).—Ayacut to be benefited, 273 acres. The expenditure incurred on the work during the year and to the end of the year was Rs. 10,520 and Rs. 15,974. respectively. The work was completed except fixing up of pipes in masonry. Programme for 1952–53, Rs. 12,400.

4·056. *Extension of Muniyeru main channel*—(*Estimate Rs.* 3,12,400).—Ayacut to be benefited, 2,800 acres. The expenditure incurred on the work during the year and to the end of the year was Rs. 26,684 and Rs. 3,14,120, respectively. The work was completed except few items.

4·057. *Providing irrigation facilities to Kollipera block*—(*Estimate Rs.* 2,06,050).—Ayacut to be benefited, 1,767 acres (new). The expenditure incurred on the work during the year and to the end of the year was Rs. 3,750 and Rs. 35,161, respectively. Programme for 1952–53, Rs. 52,400.

4·058. *Providing irrigation facilities to Adavuladivi lands*—(*Estimate Rs.* 14,700).—Ayacut to be benefited, 154 acres (new). The expenditure incurred on the work during the year and to the end of the year was Rs. 86 and Rs. 5,927 respectively. The work was completed and brought into beneficial use.

4·059. *Providing irrigation facilities to Pedapalli and Allur blocks*—(*Estimate Rs.* 6,31,000).—Ayacut to be benefited, 8,276 acres. The expenditure incurred on the work during the year and to the end of the year was Rs. 76,731 and Rs. 3,55,326 respectively. The work was almost completed. Land acquisition charges have to be paid. Programme for 1952–53, Rs. 1,62,500.

4·060. *Providing irrigation facilities to Pedaganjam block*—(*Estimate Rs.* 68,750).—Ayacut to be benefited, 600 acres. The expenditure incurred on the work during the year and to the end of the year was Rs. 5,577 and Rs 50,496 respectively. The work was almost completed except few minor items. The scheme was brought into beneficial use. Programme for 1952–53, Rs. 1,300.

4·061. *Improvements to Morthotaparra channel*—(*Estimate Rs.* 61,600).—Ayacut to be benefited, 568 acres (new) and 1,052 acres (existing). The expenditure

incurred on the work during the year and to the end of the year was Rs. 2,566 and Rs. 24,874 respectively. The work was completed and brought into beneficial use.

4·062. *Providing irrigation facilities to dry block in Undavalli, Pedapalli and Kolanukonda villages*—(*Estimate Rs.* 2,76,000 *for works and Rs.* 3,41,856 *including Direct and Indirect charges*).—Ayacut to be benefited, 1,456 acres (new). The expenditure incurred on the work during the year and to the end of the year was Rs. 6,915. Excavation of channel was nearing completion. Pump-house and masonry works were under construction. Programme for 1952–53, Rs. 1,25,000.

4·063. *Improvements to No. II branch channel of Kollur North side channel*—(*Estimate Rs.* 68,700).—Ayacut to be benefited, 360 acres. The expenditure incurred on the work to the end of the year was Rs. 1,500. The scheme was ordered to be revised and the matter was under correspondence. Programme for 1952–53, Rs. 4,000.

4·064. *Excavating new Atchampalem channal*—(*Estimate Rs.* 1,24,640).—Ayacut to be benefited. 700 acres. The expenditure incurred on the work during the year and to the end of the year was Rs. 3,519 and Rs. 29,887, respectively. The work aws almost completed except few minor items. Programme for 1952–53, Rs. 3,000.

4·065. *Excavating the new Seethampeta channel for providing irrigation facilities to Dendulur and other villages*—(*Estimate Rs.* 4,96,070 *for works and Rs.* 6,56,000 *including Direct and Indirect charges*).—Ayacut to be benefited, 2,505 acres (new) and 5,010 acres (existing). The expenditure incurred on the work during the year and to the end of the year was Rs. 8,912 and Rs. 3,69,325. The work was almost completed with the exception of excavation of catch drains and construction of pipe sluices in masonry.

4·066. *Providing irrigation facilities to Rudravaram and Chingurukota villages*—(*Estimate Rs.* 42,480).—Ayacut to be benefited, 638 acres. The expenditure incurred on the work during the year and to the end of the year was Rs. 5,019 and Rs. 23,220 respectively. The work was completed.

4·067. *Providing irrigation facilities to Katur and Kalvapumula village*—(*Estimate Rs.* 21,700).—Ayacut to be benefited, 909 acres. The expenditure incurred on the work during the year and to the end of the year was Rs. 5 and Rs. 15,913, respectively. The work was completed.

4·068. *Providing irrigation facilities to 440 acres of land in Puttugunta village*—(*Estimate Rs.* 29,600).—Ayacut to be benefited, 440 acres. The expenditure incurred on the work during the year and to the end of the year was Rs. 1,712 and Rs. 22,083 respectively. The work was completed. Land acquisition charges are to be paid. Programme for 1952–53, Rs. 5,400.

4·069. *Constructing a combined bridge and regulator across Chandrya drain*—(*Estimate Rs.* 2,25,000).—Ayacut to be benefited, 541 acres. The expenditure incurred on the work during the year and to the end of the year was Rs. 36,112 and Rs. 89,055 respectively. The work was progressing well. Programme for 1952–53, Rs. 68,000.

4·070. *Extending Ponu Kumadu main channel*—(*Estimate Rs.* 17,900).—Ayacut to be benefited, 600 acres. The expenditure incurred on the work to the end of the year was Rs. 4,594. The work was completed and land acquisition charges are to be adjusted. Programme for 1952–53, Rs. 7,600.

4·071. *Extending irrigation facilities under Bandar Fort block*—(*Estimate Rs.* 24,860).—Ayacut to be benefited, 983 acres. The expenditure incurred on the work during the year and to the end of the year was Rs. 96 and Rs. 16,712 respectively. The work was almost completed except a few minor items.

4·072. *Extending irrigation facilities under Kothameracodu channel*—(*Estimate Rs.* 65,000).—Ayacut to be benefited, 1,720 acres. The expenditure incurred on the work during the year and to the end of the year was Rs. 915 and Rs. 27,167 respectively. The work was in good progress. Programme for 1952–53, Rs. 12,500.

4·073. *Providing irrigation facilities to dry lands of Mandavalli and Chigurukota villages*—(*Estimate Rs.* 32,000).—Ayacut to be benefited, 638 acres. The expenditure incurred on the work to the end of the year was Rs. 33,876. The work was almost completed except few minor items and payment of land acquisition charges.

4·074. *Providing irrigation facilities to dry lands of Kankatava and Mokkullu villages*—(*Estimate Rs.* 11,650).—Ayacut to be benefited, 656 acres. The expenditure incurred on the work during the year and to the end of the year was Rs. 1,262 and Rs. 10,473 respectively. The work was completed.

4·075. *Providing irrigation facilities to lands of Vaivaka and Pedatummudi villages*—(*Estimate Rs.* 66,000).—Ayacut to be benefited, 550 acres. The expenditure incurred on the work during the year and to the end of the year was Rs. 1,015 and Rs. 67,646 respectively. The work was almost completed.

4·076. *Providing irrigation facilities to Bandar West block*—(*Estimate Rs.* 82,040).—Ayacut to be benefited, 1,039 acres. The expenditure incurred on the work during the year and to the end of the year was Rs. 2,745 and Rs. 61,072 respectively. The work was almost completed with the exception of few finishing works and payment of land acquisition charges. Programme for 1952–53, Rs. 15,400.

4·077. *Providing irrigation facilities to Majeru and Lankapalli block*—(*Estimate Rs.* 65,050).—Ayacut to be benefited, 900 acres. The expenditure incurred on the work during the year and to the end of the year was Rs. 986 and Rs. 25,685 respectively. The work was in progress. Provision of ramps and fixing up of pipes in the canal bank have to be attended to. Programme for 1952–53, Rs. 5,000.

4·078. *Excavating new Chilakalapudi channel*—(*Estimate Rs.* 96,400).—Ayacut to be benefited, 1,311 acres. The expenditure incurred on the work during the year and to the end of the year was Rs. 761 and Rs. 25,114 respectively. The work was in progress. Programme for 1952–53, Rs. 36,300.

4·079. *Providing irrigation facilities to Buddalapalem and Kakarlamudi villages*—(*Estimate Rs.* 1,49,270).—Ayacut to be benefited, 1,400 acres. The expenditure incurred on the work during the year and to the end of the year was Rs. 16,329 and Rs. 75,592 respectively. The work was almost completed except few minor items and payment of land acquisition charges. Programme for 1952–53, Rs. 24,000.

4·080. *Providing irrigation facilities under Lellapudi and Kodur blocks*—(*Estimate Rs.* 37,600).—Ayacut to be benefited, 1,800 acres. The expenditure incurred on the work during the year and to the end of the year was Rs. 2,326 and Rs. 36,954 respectively. The work was almost completed.

4·081. *Excavating subsidiary drain to Plaraj drain*—(*Estimate Rs.* 41,450).—The expenditure incurred on the work during the year and to the end of the year was Rs. 730 and Rs. 38,434 respectively. The work was completed. Land acquisition charges have to be paid.

4·082. *Extending Madepalli main channel*—(*Estimate Rs.* 35,000).—Ayacut to be benefited, 566 acres. The expenditure incurred on the work during the year and to the end of the year was Rs. 15,977 and Rs. 21,915 respectively. The work was almost completed.

4·083. *Providing irrigation facilities to the ayacut under Bandar fort block and Mara Agraharam*—(*Estimate Rs.* 22,000).—Ayacut to be benefited, 983 acres. The expenditure incurred on the work during the year and to the end of the year was Rs. 433 and Rs. 30,927 respectively. The work was almost completed except few minor items.

4·084. *Providing irrigation facilities to Borrapothupalem under Manginapudi channel*—(*Estimate Rs.* 1,25,000).—Ayacut to be benefited, 2,480 acres. The expenditure incurred on the work during the year and to the end of the year was Rs. 6,348 and Rs. 49,875 respectively. The work was almost completed except few minor items and payment of land acquisition charges. Programme for 1952–53, Rs. 7,500.

4·085. *Providing irrigation facilities to Pedapatnam and Narayanapalayam*—(*Estimate Rs.* 3,08,000).—Ayacut to be benefited, 2,224 acres (new). The expenditure incurred on the work during the year and to the end of the year was Rs. 99,230 and Rs. 2,58,735 respectively. Almost all the work was completed except fixing shutters to the regulator. Programme for 1952–53, Rs. 31,300.

4·086. *Improvements to Chiralue channel taking bothi under Government control*—(*Estimate Rs.* 14,000).—Ayacut to be benefited, 734 acres. The expenditure incurred on the work during the year and to the end of the year was Rs. 7,204 and Rs. 10,451, respectively. The work was completed and brought into beneficial use.

4·087. *Lowering the stills of Nallamada Bridge, etc.*—(*Estimate Rs.* 51,800).—The proposal is intended to minimise submersion of lands in the existing ayacut. The expenditure incurred on the work during the year and to the end of the year was Rs. 30,141 and Rs. 50,084 respectively. Programme for 1952–53, Rs. 4,000.

4·088. *Providing irrigation facilities to lands under Aravapalli channel*—(*Estimate Rs.* 21,000).—Ayacut to be benefited, 270 acres (new) and 400 acres (existing). The expenditure incurred on the work during the year and to the end of the year was Rs. 1,122 and Rs. 7,460 respectively. The work was completed and brought into beneficial use.

4·089. *Reconstructing the Karalapalem Syphon*—(*Estimate Rs.* 1,10,000).—Ayacut to be benefited, 927 acres (new) and 1,382 (existing). The expenditure incurred on the work during the year and to the end of the year was Rs. 5,800 and Rs. 88,564 respectively.

4·090. *Providing irrigation facilities to Patmata and Gunadala villages*—(*Estimate Rs.* 1,20,400 *for works and Rs.* 1,47,524 *including Direct and Indirect charges.*)—Ayacut to be benefited : 512 acres (new). The expenditure incurred on the work during the year and to the end of the year was Rs. 3,933. The channel was partly ex-cavated and the balance of work was under execution. Pumphouse and masonry works were under construction. Programme for 1952–53, Rs. 1,17,400.

4·091. *Providing irrigation facilities to Rachapatnam and Kallapalem villages*—(*Estimate Rs.* 34,800).—Ayacut to be benefited, 500 acres. The expenditure incurred on the work during the year and to the end of the year was Rs. 242 and Rs. 15,679 respectively. The work was completed and land acquisition charges have to be adjusted.

4·092. *Improvements to Chandraya drain at its infall into Kolleru lake*—(*Estimate Rs.* 21,000).—Ayacut to be benefited, 900 acres. The expenditure incurred on the work during the year and to the end of the year was Rs. 11,921. The work was almost completed, except a few minor items and payment of land acquisition charges.

4·093. *Extending Veeravalli No.* 1 *channel*—(*Estimate Rs.* 64,300).—Ayacut to be benefited : 982 acres. The expenditure incurred on the work during the year and to the end of the year was Rs. 1,875 and Rs. 25,922 respectively. The work was in progress. Programme for 1952–53, Rs. 10,300.

4·094. *Providing irrigation facilities to about* 1,500 *acres lying in Pallevada and Kottada*—(*Estimate Rs.* 1,20,000).—Ayacut to be benefited, 1,500 acres. The expenditure incurred on the work during the year and to the end of the year was Rs. 97. The work was in progress. Programme for 1952–53, Rs. 1,00,000.

4·095. *Development of irrigation under Bhavanasi tank system by raising the F.T.L. by* 9 *inches.*—(*Estimate Rs.* 33,000).—Ayacut to be benefited, 100 acres. The expenditure incurred on the work during the year and to the end of the year was Rs. 2,591 and Rs. 6,552 respectively. The work was completed except payment of land acquisition charges. Programme for 1952–53, Rs. 23,400.

4·096. *Reclamation of Vemavaram tank*—(*Estimate Rs.* 42,935).—Ayacut to be benefited, 116 acres. The expenditure incurred on the work during the year and to the end of the year was Rs. 15,324 and Rs. 16,359 respectively. The work

was almost completed. Paved inlet has to be constructed. This item of work was also nearing completion. Programme for 1952–53, Rs. 3,300.

Drainage Schemes.—*B. Other works*—4·097. *Improvements to Romperu drain*—(*Estimate Rs.* 1,01,20,000 *for works and Rs.* 1,05,59,000 *including D. & I. charges*).—Ayacut to be benefited, 10,000 acres. The scheme provides for improving Romperu drain and allied drains, viz., Perali and Kunderu with a view to ensure speedy disposal of floods and incidentally to release for wet cultivation, a belt of 4½ furlongs. The scheme was divided into three sections for convenience in execution. Earthwork in the lower reaches was nearly completed. Earthwork in the upper reaches will be taken up during 1952–53. The expenditure incurred on the work during the year and to the end of the year was Rs. 13,05,958 and Rs. 68,41,063 respectively. Programme for 1952–53, Rs. 25 lakhs.

4·098. *Improvements to Pedalanka drain from the head to the undertunnel at Garisapudi*—(*Estimate Rs.* 15·4 *lakhs. Revised Estimate Rs.* 19·58 *lakhs*).—The expenditure incurred on the work during the year and to the end of the year was Rs. 3,79,926 and Rs. 17,63,542 respectively. The work was completed in all respects.

4·099. *Remodelling Komali channel and its branches*—(*Estimate, Rs.* 23,800).—Ayacut to be benefited, 171 acres (new). The expenditure incurred on the work during the year and to the end of the year was Rs. 3,621. The work was in progress and is expected to be completed during 1952–53. Programme for 1952–53, Rs. 4,000.

4·100. *Diverting Raju channel from m.* 2/6 *to m.* 3/3.—(*Estimate, Rs.* 26,900).—Ayacut to be benefited, 143 acres. The expenditure incurred on the work during the year and to the end of the year was Rs. 1,415 and Rs. 15,581, respectively. The work was completed.

4·101. *Providing irrigation facilities to Gurazada block*—(*Estimate Rs.* 22,600).—The expenditure incurred on the work to the end of the year was Rs. 26,169. The work was completed except few minor items. Programme for 1952–53, Rs. 100.

4·102. *Improvements to new Thamarakollu channel*—(*Estimate Rs.* 29,850).—The expenditure incurred on the work during the year and to the end of the year was Rs. 13 and Rs. 22,669. Programme for 1952–53, Rs. 1,500.

4·103. *Constructing* 6. *M.S. punts for use in Vijayavada circle*—(*Estimate Rs.* 1,38,000).—The expenditure incurred on the work during the year and to the end of the year was Rs. 58,988. Two M.S. punts were launched during the year for use in the delta. The balance 4 M.S. punts were under construction. Programme for 1952–53, Rs. 51,000.

4·104. **Pennar River Canal System**—*A. Grow More Food Works—Excavation of a new channel from Pyderu river, Uchalaguntapalem village in Kovur taluk*—(*Estimate Rs.* 35,000 *for works and Rs.* 45,540 *including D. & I. charges*).—Ayacut to be benefited, 400 acres. The expenditure incurred on the work during the year and to the end of the year was Rs. 346 and Rs. 16,364 respectively. The work was in progress. Programme for 1952–53, Rs. 19,000.

4·105. *Providing irrigation facilities to Yellamanchipad Shrotriem Kanigiri Reservoir by excavating a supply channel with a separate head sluice*—(*Estimate Rs.* 60,500 *for works and Rs.* 78,777 *including D. and I. charges.*)—Ayacut to be benefited, 350 acres. The scheme provides for excavating a new channel for a length of about 5,280 feet with a separate head sluice for raising a late-sown short crop from October onwards. The expenditure incurred on the work during the year and to end of the year was Rs. 40 and Rs. 70,253 respectively. Programme for 1952–53: Rs. 10,000.

4·106 *A. Grow More Food works Excavation of a new surplus channel from right flank of Nemem tank to Chembarambakkam tank*—(*Estimate, Rs.* 6,49,000 *for works and Rs.* 8,44,397 *including D and. I. charges*).—Ayacut to be benefited, 1,478 acres. The expenditure on the work during the year and to the end of the year was

Rs. 2,31,776 and Rs. 3,02,520 respectively. The work is expected to be completed during the year 1952-53. Programme for 1952-53 : Rs. 2,12,400.

NOTE.—This work was originally classified under Palar Anicut System. It has since been classified under non-system tanks.

Yerur Tank System—*A. Grow More Food Works*—4·107. *Fitting of falling shutters over Kota Anicut*—(*Estimate Rs.* 58,000 *for works and Rs.* 75,462 *including D. and I. charges*).—Ayacut to be benefited: 200 acres. The expenditure incurred on the work during the year and to the end of the year was Rs. 23,503 and Rs. 45·028 respectively. The work was in progress and is expected to be completed during 1952-53. Programme for 1952-53 Rs. 4,000.

Hajipuram Tank System—*A. Grow More Food Works*—4·108. *Improvements of supply Channel to Hajipuram tank*—(*Estimate Rs.* 3,38,750 *for works and Rs.* 4,47,740 *including D. and I. charges*).—Ayacut to be benefited : 200 acres (new) and 700 existing. The expenditure incurred on the work during the year and to the end of the year was Rs. 1,97,538 and Rs. 2,09,553 respectively. The work was in progress and is expected to be completed during 1952-53. Programme for 1952-53 : Rs. 2,15,700.

4·109. *Araniar Project—A. Grow More Food Works—Chingleput District*—(*Estimate Rs.* 95,78,000 *for works and Rs.* 1,04,19,000 *including D. and I. charges*).—Ayacut be benefited, 2,500 acres (new) and 10,000 acres (existing) under tanks. The proposal is to construct a reservoir of about 1,863 m.c. ft. capacity near Pisathur and one pick-up anicut down stream. Drought stricken areas of Ponneri and Trivellore taluks of Chingleput district will be benefited by this scheme. The expenditure incurred on the work during the year and to the end of the year was Rs. 1,00,031. The work was in progress. Programme for 1952-53, Rs. 7 lakhs.

4·110. *Rallapad Reddikalva Project first stage*—(*Revised Estimate Rs.* 10,90,000 *for work and Rs.* 14,22,050 *including D. and I. charges.*)—Ayacut to be benefited, 2,825 acres. This work consists of constructing an anicut across Manneru in Veeraraghavanikota and a supply channel along the abandoned course of Reddikalva to the foreshore of Machavaram and Mopad tanks. The excavation of the supply channel was completed and the masonry works were in various stages of progress. The expenditure incurred on the work during the year and to the end of the year was Rs. 2,41,640 and Rs. 7,55,389 respectivoly. The work was in progress, and is expected to be completed during 1952-53. Programme for 1952-53, Rs. 2,37,300.

B. Other Works—4·111 *Rallapad Reservoir Reddikalva Scheme, second stage*—(*Estimate Rs.* 48,00,400).—This scheme is for a reservoir of Rs. 3,600 m.c. ft. across Manneru near Lingasamudram to irrigate 8,175 acres by a canal 10 miles long taken from its right flank. The expenditure incurred on the work during the year and to the end of the year was Rs. 1,59,087 and Rs. 2,59,715 respectively. The work was in progress. Programme for 1952-53, Rs. 10 lakhs.

4·112. *Karedu Anicut Scheme*—(*Estimate Rs.* 4,34,500 *for works and Rs.* 5,66,152 *including D. and I. charges*).— Ayacut to be benefited, 2.200 acres (existing) and ayacut of 158 acres (new). The expenditure incurred on the work during the year and to the end of the year was Rs. 1,84,510 and Rs. 4,35,224 respectively. The work was in progress and is expected to be completed during the year 1952-53. Programme for 1952-53 : Rs. 16,500.

4·113. *Madras Water Supply and Irrigation System*—(1) *Providing emergency shutters in front of automatic shutters in Red-Hills.*—(*Estimate Rs.* 30,000).—The expenditure incurred on the work during the year and to the end of the year was Rs. 1,047 and Rs. 17,467 respectively. The work was in progress and the workshops portions of the work only remains to be done. Programme for 1952-53, Rs. 2,500.

Malabar District—*A. Grow More Food Works*—4·114. *Cheramangalam Anicut Scheme*—(*Estimate Rs.* 9,40,000).—Ayacut to be benefited, 1,874 acres. The proposal is for the construction of anicut across Gayatripuzha at Cheramangalam and to excavate a canal therefrom. Water from Malampuzha Reservoir, now under

execution, can be let down to Gayatri river and irrigation under this anicut extended up to 5,000 acres. The work was practically completed. Land acquisition is pending with Revenue Department. The expenditure incurred on the work to the end of the year was Rs. 3,36,204. Programme for 1952-53, Rs. 63,000.

Salem district—*A. Grow More Food Works*—(1) 4·115. *Constructing an anicut across Uduthorahalla stream in Kollegal taluk* (*Estimate, Rs.* 1,61,500).—Ayacut to be benefited, 800 acres. The expenditure incurred on the work during the year and to the end of the year was Rs. 1,102 and Rs. 1,36,914 respectively. The work was almost completed. Proposals for providing screw gearing shutters were under examination. Programme for 1952-53, Rs. 6,000.

Salem District.—4·116. *Constructing an anicut across Markandanadhi and Maraamudram and excavating a channel to feed Badathalai tank.—Estimate Rs.* 11·43 *lakhs.*—Ayacut to be benefited, 834 acres (new) and 431 acres (old). The anicut work was completed in all respects. In the channel portions the heavy embankment was almost completed. Of the 28 cross masonry works, 27 were completed. The expenditure incurred on the work during the year and to the end of the year was Rs. 3,47,374 and Rs. 8,81,898 respectvely. The excavation of channal was progressing fairly. Programme for 1952-53, Rs. 33,000.

North Arcot District—*A. Grow More Food Works*—4·117. *Reopening the sand vents and providing falling shutters to Palar Anicut* (*Estimate Rs.* 1,95,000).—Ayacut to be benifited 3,110 acres. The expenditure incurred on the work during the year and to the end of the year was Rs. 63,762 and Rs. 93,995 respectively. The work was taken up during 1950-51 and completed during the year.

4·118. *Restoration of Edavalli Tank—Estimate Rs.* 38,000.—Ayacut to be benefited 50 acres. The work was not taken up for excavation during the year and is programmed for excavation in 1952-53. Programme for 1952-53. Rs. 33,000.

Kurnool District—*A. Grow More Food Works*—(1) 4·119. *Formation of a reservoir across Tigaleru near Eguavacherlapalle*—(*Estimate Rs.* 10·8 *lakhs for works and Rs.* 14·06 *lakhs including D. and I charges*).—Ayacut to be benefited : 600 acres. Nearly 70 per cent of earthwork and 80 percent of puddle clay work were completed. Construction of a sluice in the bund and surplus weir as well as drops 1 and 2 were also completed. The expenditure incurred on the work during the year and to the end of the year was Rs. 1,97,249 and Rs. 7,47,586 respectively. Earthwork for the bund was in progress. Programme for 1952-53 : Rs. 3,00,000.

4·120. *Formation of a reservoir across Kollimagulavagu near Panyam*—(*Estimate Rs.* 7·7 *lakhs for works and Rs.* 10·06 *lakh including D. and I. charges*).—Ayacut to be benefited : 700 acres. 50 per cent of puddle clay work was done and the sluice including Tower head was completed. The expenditure incurred on the work during the year and to the end of the year was Rs. 1,82,882 and Rs. 3,86,777 respectively. Earthwork for the bund and construction of masonry core wall across first and second streams were in progress. Programme for 1952-53 : Rs. 3,06,200.

4·121. *Restoration of breached Gutupalle tank* (*Estimate—Rs.* 99,000 *for works and Rs.* 1,30,950 *including D. and I. charges*).— Ayacut to be benefited : 150 acres. The tower head sluice and bodywall of left surplus weir were completed. The left surplus course was deepened and foundation of right surplus course was excavated. The expenditure incurred on the work during the year and to the end of the year was Rs. 35,104 and Rs. 37,094 respectively. The breaches Nos. I and II were being closed. Programme for 1952-53 : Rs. 36,000.

4·122. *Restoration of breached Nallareddy tank of Kothakota village*—(*Estimate Rs.* 71,500 *for works and Rs.* 93,207 *including D. and I. charges.*)—Ayacut to be benefited : 66 acres. The puddle core wall was built and works relating to sluice and weir were completed except revetment for weir. The expenditure incurred on the work during the year and to the end of the year was Rs. 13,913 and Rs. 18,962 respectively. The breach closing work was in progress. Programme for 1952-53 : Rs. 47,500.

Anantapur district—*A. Grow More Food Works*—4·123. (1) *Pennar Kumudavathi project.*—(*Estimate Rs.* 17,00,000 *for works and Rs.* 19,60,000 *including D. and I.*

charges.)—Ayacut to be benefited 1,707 acres. The proposal is to construct an anicut on the Pennar near Hindupur just below the confluence of the Kumudavathi with the Pennar and excavate channels on both sides to augment the supply to Parigi and seven other tanks. Bodywall of the anicut was constructed to the full length. Cross bunds were formed in front of scouring sluices and extension of apron in rear was in progress. Regarding excavation of channels, the work on Parigi, Sasanakota, Kollakunda, Kotnur and Utakur channels was completed. 80 per cent work on Subbarayanapalle channel was done. The expenditure incurred on the work during the year and to the end of the year was Rs.9,37,453 and Rs. 12,18,698 respectively. Masonry works across the channels were in progress. Programme for 1952–53 : Rs. 6,35,000.

4·124. *Restoration of Pilliguntla tank of Kammavaripalli village (Kalyandrug taluk)—Estimate Rs.* 1,50,000. *for works and Rs.* 1,95,700 *including D and I charges*).—Ayacut to be benefited 200 acres. Of the six breaches in the bund, four breaches were closed, and two were being closed. Earthwork for raising and strengthening existing bund was completed. Of the two weirs, one weir was completed and the other was being constructed. Work on sluices was completed. The expenditure incurred on the work during the year and to the end of year was Rs. 38.663 and Rs. 52,341 respectively. Programme for 1952–53, Rs. 80,000.

B. Other works—4·125. *Upper Pennar Project at Perur—Estimate,Rs.* 74·7 *lakhs works and Re.* 84 *lakhs including D. and I. charges.*—Ayacut to be benefitted 6,000 acres. The preliminary work such as collection of stores, acquisition of machinery, improvements to approach road from Nagasamudram to work site, construction of camp buildings, etc., was done. The expenditure incurred on the work during the year and to the end of the year was Rs. 5,04,302 and Rs. 5,33,678 respectively. Programme for 1952–53, Rs. 15,14,700.

Cuddapah District.—*A. Grow More Food works*—4·126. *Formation of a Reservoir across Goderu river near Thippireddypalle village—(Estimate Rs.* 1,87,000 *for works and Rs.* 2,44,135 *including D. and I. charges*).—Ayacut to be benefited 250 acres. Earthwork for forming the bund for the reservoir, puddle core wall work for the bund, and construction of masonry sluice in the bund were in progress. Earthwork excavation was also in progress for the irrigation channel for a length of six furlongs against total length of nine furlongs. The expenditure incurred on the work during the year and to the end of the year was Rs. 43,431. Programme for 1952-53, Rs. 1,35,000.

Coimbatore District—*A. Grow More Food Works*—4·127. *Excavating a new Perumugai Athani Branch channel from Arakkankottah channel.—(Estimate, Rs.* 6,25,700 *for works and Rs.* 8,05,880 *including D. and I. charges*).—Ayacut to be benefited 1,800 to 2,000 acres. The proposal is to excavate a new channel branching from the Arakkankottah channel of the Bhavani river. The expenditure incurred on the works during the year and to the end of the year was Rs. 1,07,177. The excavation of the channel was good progress. Programme for 1952–53, Rs. 5,25,000.

4·128. **Lower Bhavani Project.**—The project consists of a dam partly masónry and partly earth about 5½ miles long on the Bhavani below the junction of Moyar and Bhavani rivers in Coimbatore district and a main canal originally about 90 miles long but since extended to 122 miles, the extension canal irrigating 25,000 acres in Dharapuram taluk (which is a famine-affected tract) and Karur taluk. This is a scheme of largest magnitude sanctioned by Government since the popular Government came into office in 1946. It will irrigate dry crops (cotton and food crops) on an area of about 207,000 acres in the taluks of Gobichettipalayam, Erode, Bhavani and Dharapuram of the Coimbatore district and Karur taluk of Tiruchirapalli district. Hydro-electic power will also be developed to the extent possible later on. The total sanctioned estimate for the project inclusive of Dharapuram Extension is about Rs. 950·90 lakhs and the estimated annual output of cotton and millets over that area is 25,000 tons of cotton and 33,000 tons of millets. Rice will also be cultivated over 10,000 acres of lands which are likely to get affected by lack of drainage facilities giving 5,000 tons

of rice. It is expected that, by 1st September 1952, the project would have been brought into beneficial use by supply of water to about 12,000 acres of new area in the head-reaches of the canal. Photographs giving an idea of the several works in the progress are attached.

Head Works.—4·129. *Masonry Dam.*—The third or final stage of Coffer-dam to divert the water through the sluices and constructing the masonry dam from one end to the other without the necessity to keep a portion of the masonry dam at the bed level, were completed. The river sluices are to operate under a head of 105 feet and for this purpose, sluice gates incorporating all the modern developments in outlets for dams for all the sluices were received at the site and erected and concreted in position. Four penstock pipes, each 8 feet diameter were also erected in the body of the dam and concreted. The total masonry built to the end of the year was 11·9 million cubic feet as against 14 million cubic feet to be done for the completion of the masonry dam. The works that were completed in the masonry portion of the dam for the end of the year are (1) excavation of foundations, (2) benching and preparation of foundations, (3) drilling and grouting the foundations and (4) 85 per cent of the total quantity of masonry to be built for the completion of the dam.

4·130. Collection of face stones, rubble, sand, etc., kept pace with needs of the works.

4·131. *Earth dam.*—The length of the earth dam alone is about 5¼ miles and it is divided into three reaches for convenience in execution. The work was in progress on the entire length of the dam. Cut-off trenches were excavated and foundations grouted by drilling holes 30 feet deep at every 10 feet intervals. R.C. cut-off walls were cast. The rear and toe filters were completed for the entire length of the dam. Earth-work for the embankment was in progress throughout the year. The earth dam was formed to full section for about two miles length and the work on the balance portion was in progress. On the main earth dam roughly 90 million cubic feet was done during the year against the total of 161 million cubic feet of earth-work to be done for completion. These quantities are exclusive of auxiliary works.

4·132. *Water-supply to camp.*—The entire project colony is served with good protected and chlorinated water-supply and all the drainage in the camp area are of the water-borne type. The result was that during the year under report, there was no epidemic of any kind and the health of the dam was maintained at a very high level of efficiency.

4·133. *Buildings and camps.*—All the quarters, except one, were built on a quasi-prmanent type. In all, six hundred buildings' were constructed. In addition, grain shops, godowns, shops, hospitals, in-patient ward, maternity ward, police station, sub-treasury, Post and Telegraph office, a number of stalls were also put up. A cafeteria entirely controlled by the department to maintain very high quality of food stuffs, but made available at very cheap rates, is also run in the camp.

4·134 There is a Circuit House called Bhavani House, with four suites of rooms to cater to the needs of the visitors. There are also five rest-sheds for various workers that may come to the project on business.

4·135. *Housing.*—The entire labour as well as the staff were provided with quarters. Parks and playing amenities for the children of the labour and others were also provided. A higher elementary school with seven classes having a strength of 250 students is run by the project. Ration shops were also working in the project and run efficiently. The entire colony with the buildings and other amenities have a very impressive appearance.

4·136. *Stores.*—Stores have been organized on proper lines and the materials for the project are collected systematically and accounts maintained.

4·137. *Workshops.*—To meet all the requirements of the project, a workshop, equipped with modern types of machine tools, with a foundry and cupola attached was maintained throughout the year. All the requirements of the project, like building lorries, manufacture of sheepsfoot rollers were undertaken in the

workshop and carried out at cheap rates. The cost of sheepsfoot rollers made is less than about half the cost of the imported article. The shop has in many ways saved heavy expenditure on outside work and imported material from foreign countries.

4·138. *Field machinery.*—A special subdivision is working for the up-keep and maintenance of field machinery inclusive of an automobile shop. In all, 356 machines of various types, such as scrapers, lorries, tractors, dumpers, excavators, compressors, mixers, locos, etc. tractors were working in the project. These machines have a regular programme of servicing and all repairs needed were attended to then and there and in time. The percentage of idle machinery was kept as low as five per cent.

4·139. *Supplies.*—Supply of sand became a problem as all the sand available in the river bed for 15 miles both up and down stream of the dam site was exhausted. It became necessary to go in for sand from distant places.

4·140. *Roads.*—Most of the camp roads are all gravel roads excepting those subject to heavy traffic which are metalled and kept to proper standards. This division is in-charge of 70 miles of roads and they all were kept in good condition.

4·141. *Land Acquisition.*—All the lands required for the headworks and water-spread area were acquired.

4·142. *Rehabilitation.*—About 13 villages will be affected by the formation of the reservoir. All the lands and the houses in the reservoir area were acquired and the people were paid for their properties at current market rates plus 15 per cent Solatium. In order to provide accomodation to those whose lands were acquired in the water-spread area, about 6,000 acres of forest area were cleared and made habitable and fit for cultivation. Most of the villagers have gone to the new sites and built their houses.

4·143. The expenditure incurred on head-works during the year and to the end of the year was Rs. 1,41,62,481 and Rs. 4,38,35,728 respectively.

Canals.—4·144. *Main canal.*—The canal was dug and banks formed for the entire length except for a few gaps at the sites of some of the major cross drainage works. It may be said in general terms that about 90 per cent of the work was completed. About 30,000 men work in the canal area between March and August and the strength dwindles down to about 15,000 in the remaining months of the year due to diversion of labour for agricultural purposes. In fact, the canal works have been useful for the employment of the labour in the distressed areas due to more or less famine conditions. Of 111 cross drainage works in the main canal, 90 were completed and the remaining were in an advanced stage of progress. In the Extension Canal, there are about 66 cross drainage works. Work on these has just been started. The canal crosses a number of roads and bridges are constructed at all these crossings. Sixty-eight bridges come in the main canal area and 32 in the extension canal. Practically all the bridges in the main canal and 50 per cent of those in the extension canal were completed.

4·145. *Approach canal and main canal from* 0/0 *to* 1/2.—These portions are in charge of the head works division. The works in them were almost completed.

4·146. *Canal Reach from* 1/2 *to* 18/2.—25·53 Million cubic feet of earthwork including rock blasting was done during the year. Good portion of the building programme was completed during the year 1950–51 and balance of work was done during the year. All bridges (12 numbers) in this reach were also completed. Of the 20 cross drainage works, 15 small works consisting of undertunnels and two aqueducts were completed. The remaining were in advanced stage of progress.

4·147. *Canal Reach from* 18/2 *to* 40/5.—A total of 19·3 million cubic feet of earthwork including rock blasting were carried out. Building programme was completed during 1950–51 and a small balance work left over was completed during the year. Of 16 bridges in this reach, 11 were completed and the work on the remaining five was in advanced stage of progress. There are 21 cross drainage works in this reach of which four are major aqueducts. All the small works were completed and major aqueducts were in progress.

4·148. *Canal Reach from* 40/5 *to* 57/5.—The quantity of earthwork done during the year including rock blasting was 24 million cubic feet. Four buildings were completed in the previous year. All the 10 bridges in the reach were completed except one foot bridge which is to be taken up for execution. Of the 23 cross drainage works, 12 small works were completed. Nine small works and two major aqueducts were in progress.

4·149. *Canal Reach from* 57/5 *to* 74/1.—The earth work in this reach was practically completed except a small balance of about three million cubic feet which will be completed in 1952–53. Thirteen bridges were also completed during the year. All the cross drainage works, viz. 25 works in this reach were completed except one aqueduct and one canal syphon. They were in advanced stage of progress.

4·150. *Canal Reach from* 74/1 *to* 89/0.—The earth work in this reach was practically completed except a small balance of about 2·5 million cubic feet. Two buildings in the reach were completed during the year. Sixteen bridges were also completed. All the 20 cross drainage works except one major aqueduct were completed. This was in advanced stage of progress.

4·151. *Extension canal.*—Of the total 50 million cubic feet of earth work in this canal, 46 million cubic feet inclusive of rock blasting were carried out. There are 17 buildings in this canal most of which were practically completed, except one dormitory and one double lascars' shed at the tail end. Out of the 32 bridges in this canal, 19 bridge works were completed and 13 were in advanced stage of progress. There are 66 cross drainage works in this canal of which 60 are small culverts and the balance six are major works. The construction of these will be taken up during 1952–53.

4·152. *Distributaries.*—All the distributaries in the main canal were taken up for execution and it may be said that about 60 per cent of earth work was done so far. About 700 masonry works were taken up for execution and nearly a third of them was completed. Three distributaries in the canal system were taken up for lining with concrete as an experimental measure. A good length of the field water courses has been dug by the farmers in this area and work on preparation of land to be irrigated was proceeding It is expected that all the direct sluices and the distributaries taking off from the main canal in the reach down to mile 12/0 will be completed during 1952–53.

4·153. *Research.*—One of the new and important features developed in the Poondi Research Station relating to the canals is a chute type of fall to replace a number of drops at short intervals in steeply falling country. This design resulted in substantial economy in the cost of the works.

4·154. The expenditure incurred on the canals during the year and to end of the year was Rs. 1,20,00,832 and Rs. 2,47,55,739 respectively.

Malampuzha Project.—4·155. This project was sanctioned in 1949 at an estimated cost of Rs. 3·80 crores. It consists of constructing a dam across the Malampuzha river and of a main canal 20 miles long with necessary distributaries. Forty-seven thousands and two hundred acres of first and second crop area, a new ayacut of 5,800 acres and 12,000 acres of third crop area will be the final ayacut proposed under the main left side canal. The place benefited by this scheme will be Palghat taluk in Malabar district.

4·156. *Headworks.*—The foundation for the main masonry dam 1,806 feet long across the river in hard rock with heel trenches 10 feet × 6 feet and toe trenches 6 feet × 3 feet was completed to the entire length and dam masonry built to an average height of 35 feet above the foundation. The dam in the sluice and penstock portion was built to the bottom of the sluices. The quantity of masonry done in the section of the dam was 32,369 units out of the total quantity of 58,035 units. The foundation of excavation in rock in respect of another subsidiary dam was completed. About 8,000 units of masonry work as against 20,000 units were completed during the period. Excavation in hard rock, highway approaches and rock blasting were completed in respect of another arm of the masonry dam. Masonry was built up to an average level of + 332·00 in L.S. 210 to 250 and up to

331·00 between L.S. 195 and 200. Total quantity of masonry built was 1,400 units against 1,750 units. The formation of earth dam was in progress, and 550 units of earth work was done as against 7,650 units. Clearance of site and excavation of core trench was completed. Other items such as formation of rock toe, filter, etc., were nearly completed.

4·157. The expenditure incurred on the work during the year and to the end of the year was Rs. 49,40,532 and Rs. 1,03,00,959 respectively.

4·158. *Programme of work for* 1952–53.—

(1) Masonry dam: 12,540 units of masonry.

(2) Earth dam : 3,500 units of earth work.

4·159. *Canals.*—Most of the investigation work of the main canal was already completed. About 75 per cent of the investigation of distributary system and field work of investigation of the water-spread area were completed. The contour map of the water-spread area was under preparation.

4·160. The execution of the main canal from 0/0 to 13/2 was in progress and most of the excavation work up to 13/2 was completed. The cross masonry works up to 12/0 were in progress, the most important being the Korayar and Kannadi aqueducts. About 50 per cent of the distributary system was under execution.

4·161. The expenditure incurred on the work during the year and to end of the year was Rs. 31·75 lakhs and Rs. 55·19 lakhs respectively. Programme for 1952–53 : Rs. 23 lakhs.

4·162. *Programme of work for* 1952–53.—It is proposed to complete only the Korayar and Kannadi aqueducts and some masonries already taken up for execution. The staff will be engaged to complete the investigation of the distributary system and take up the localisation of ayacut.

Mettur Canals Scheme.—4·163. This scheme was sanctioned in 1949 under Post-War Reconstruction Scheme for an estimated cost of Rs. 2,35,99,400 for works only and Rs, 2,66,84,800 including D. and I. charges. Forty-five thousand acres of dry lands (17,000 acres in Coimbatore district and 28,000 acres in Salem district) in Thiruchengode and Mettur taluks of Salem district and Bhavani taluk of Coimbatore will be benefited by this scheme.

4·164 *Earth-Work.*—Of the total quantity of 51,607 units of earth-work involved in the Right bank canal excavation, 25,637 units was done during the year and 47,341 units to end of the year. Earth-work excavation in left bank canal was also taken up and about 10,167 units of earth-work was completed during the year.

4·165 *Masonry Works.*—Forty-eight under-tunnels works were proposed to be constructed. Seventeen under-tunnel works were completed and 31 works were under various stages of construction. Of the six numbers of drop works, five were completed and earth-work excavation for foundation for the other was in progress. Construction of three syphons were also taken up during the year and canal portions were almost completed.

4·166. *Bridges.*—Out of the 20 bridge works, 3 works were already completed in all respects, 2 works were in progress during 1950–51 and 11 new works were started during the year and in progress. The rest were under consideration.

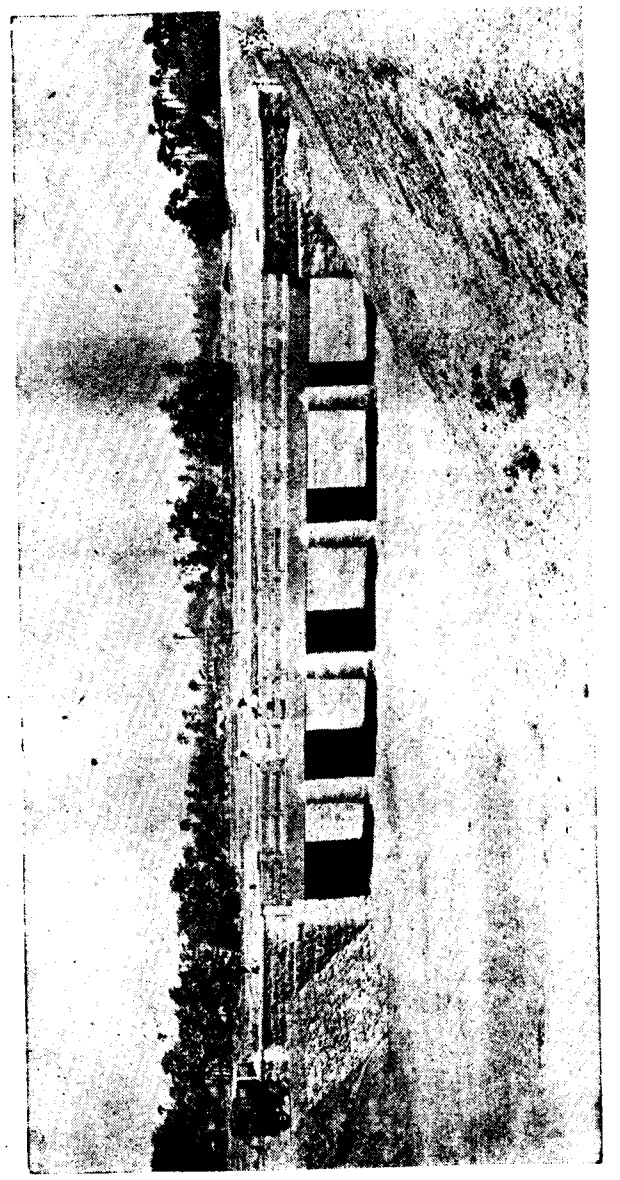
4·167. *Regulators.*—Three regulators were taken up for construction during the year and masonry was almost completed.

4·168, *Distributaries.*—Designs, land plans and schedules, etc., for 35 distributaries in right bank canal were prepared and sent to Special Deputy Collector for land acquisition purposes. Estimates for some of these distributaries were also prepared.

4·169. The expenditure incurred on the work during the year and to the end of the year was Rs. 25,98,322 and Rs. 42,34,577 respectively.

4·170. *Programme of work for* 1952–53.

4·171. *Right Bank Canal.*—This canal excavation will be completed in all respects to tail end and water will be let down up to Chittar after completing the head sluice, bridges, etc. Construction of (1) a regulator cum 10′ drop, (2) a single vent RCC box syphon for Chittar crossing, (3) the remaining piers for crossing



MATAMPUZHA PROJECT.—TYPICAL CART-TRACK CROSSING AT MILE 3–6–240 OF MAIN CANAL (31ST MARCH 1952).

the Cauvery river and (4) a RC Twin box conduits at either flank and 2 lines of steel pipe aqueduct on piers across the deep bed of the river will be taken up.

4·172. *Left Bank Canal.*—Excavation of left bank canal in other reaches will be started and a major portion completed before the end of the year.

Manimuthar Reservoir Project.—4·173 (*Estimate, of Rs.* 3,68,60,200 *for works and Rs.* 3,98,00,000 *including D. and I. charges.*—Ayacut to be benefited: 83,000 acres of existing ayacut and 20,000 acros of tank ayacut. This project comprises of storage reservoir formed by constructing a dam across the Manimuthar river at a place about 3 miles about its confluence with Tambaraparani river. The reservoir with new canal about 30 miles long and about 12 distributaries taking off at various points is expected to fill 321 tanks in Ambasamudram, Tirunelveli, Nanguneri, Srivaikuntam and Trichendur taluks of Tirunelveli district. The expenditure incurred on the work during the year was Rs. 21,26,037. The work was in progress.

4·174. *Programme of work for* 1952–53.—

(1) Excavation in blocks 6 to 13 and to build up the dam up to elevation 241.

(2) Construction of earthdam portion on the left flank between hillock which is about 1,000 feet.

(3) Excavation of foundation trenches. Construction of core walls and impervious materials filled in up to ground level.

(4) Excavation of foundation trenches for a length of 600 feet on the right flank between hillock 5 and 6 for the earthdam portion and construction of core walls.

(5) All buildings that have now been started and are incomplete will be completed. Programme for 1952–53. Rs. 37 lakhs (works).

Mangalam Reservoir Project.—4·175. This project was sanctioned in 1951 at an estimated cost of Rs. 41,05,844 for works and Rs. 44,80,010 including D. and I. charges. Ayacut to be benefited is 3,278 acres. It comprises of formation of a reservoir on the Cherukunnapuzha, a tributary of the Mangalam river about 3 miles to south of Fadakkancheri village, Palghat taluk, Malabar district and the construction of a pickup anicut 3 miles lower down and excavation a of channe taking off from the left side of the anicut. 1

4·176. Preliminary works such as investigation of alternative alignments for the dam and the channel were done. Calyx drill operations were in progress at the proposed alternative dam lines. The question of the dam line finally to be adopted has to be decided.

4·177. The expenditure incurred on the work during the year and to the end of the year was Rs. 24,458. Programme for 1952–53, Rs. 41,500.

4·178. *Programme of work for*1952–53.—Taking block levels in the ayacut area, etc., are alone proposed to be done during the year.

Walayar Project.—4·179. This project was sanctioned in 1951 at an estimated cost of Rs. 92·37 lakhs for works and Rs. 99·92 lakhs including D. and I. charges. Ayacut to be benefited is 6,500 acres. It comprises the formation of a reservoir of 520 mcft. capacity on the Walayar River in Pudusseri Village in Palghat taluk of Malabar district and excavation of two canals, one a right side canal taking off directly from the reservoir and the other a left side canal taking off from the river above Nellisseri anicut lower down the river.

4·180. Preliminary works such as investigation of alternative alignments for the dam and Madras–Calicut trunk road diversion were in progress.

4·181. The expenditure incurred on the work during the year and to end of the year was Rs.18,737.

4·182. *Programme of work for* 1952-53.—Block levels for the ayacut area and investigation of distributaries yet to be done will be taken up.

Works for which Capital and Revenue Accounts are not kept.

South Arcot District—*A. Grow More Food Work*—4·183. *Improvements to Satyamangalam large and small tanks*—(*Estimate Rs.* 1,35,000 *for works and Rs.* 1,77,712 *including D. and I. charges*).—Ayacut to be benefited 280 acres.

The expenditure incurred on the work during the year and to the end of the year was Rs. 14,927 and Rs. 34,910 respectively. Work was practically completed except provision of S.G. shutters, few syphons and drops and pipes for the lands to be irrigated. Programme for 1952–53, Rs. 25,000.

4·184. *Augmenting supply to eight tanks from Vadakkanandal anicut*—(*Estimate, Rs.* 2,10,000 *for works and Rs.* 2,73,230 *including Direct and Indirect charges*).—Ayacut to be benefited: 755 acres existing. The expenditure incurred on the scheme during the year and to the end of the year was Rs. 2,53,867 and Rs. 2,81,521, respectively. The work was almost completed except further excavation of main channel which was in progress. Programme for 1952–53, Rs. 36,000.

4·185. *Improvements to Toludur tank*—(*Estimate, Rs.* 12,000 *for works and Rs.* 15,613 *including Direct and Indirect charges*).—The expenditure incurred on the work during the year and to the end of the year was Rs. 3,406. The work has been completed except earthwork which is in progress. Programme for 1952–53, Rs. 8,500.

4·186. *Construction of a sluice in Perumal tank bund and extension of supply to Andarmullipallam*—(*Estimate, Rs.* 41,200 *for works and Rs.* 53,604 *including Direct and Indirect charges*).—Ayacut to be benefited 420 acres (additional). The expenditure incurred on the work during the year and to the end of the year was Rs. 12,346 and Rs. 19,973 respectively. The channel excavation and all the cross masonry works were completed. Construction of syphon across Paravanar and excavation of channel beyond remain to be done. Programme for 1952–53, Rs. 6,200.

4·187. *Construction of a dam across Kaludur Odai*—(*Estimate, Rs.* 97,000 *for works and Rs.* 1,27,505 *including Direct and Indirect charges*).—Ayacut to be benefited: 900 acres. The expenditure incurred on the work during the year and to the end of the year was Rs. 11,992. Well sinking for anicut foundation was completed. Construction of body wall and excavation of a channel was in progress. Programme for 1952–53, Rs. 40,000.

4·188. *Excavation of channel from Vellar above Korukkavadi anicut to irrigation lands in Lakshmipuram, etc., villages*—(*Estimate, Rs.* 27,000 *for works and Rs.* 35,101 *including Direct and Indirect charges*).—Ayacut to be benefited: 150 acres. The expenditure incurred on the work during the year and to the end of the year was Rs. 7,254. Excavation of channel was mostly completed. Concreting for the head sluice was done. The work was suspended temporarily pending decision of a suit in District Munsif's Court. Programme for 1952–53, Rs. 10,000.

B. Other works—4·189 *Construction of a protective bund along the foreshore of the French Archiwak tank*—(*Estimate, Rs.* 54,230).—The expenditure incurred on the work during the year and to the end of the year was Rs. 10,200 and Rs. 28,755 respectively. The work was in progress. Progamme for 1952–53, Rs. 2,500.

West Godavari District.—*A. Grow More Food Works*—4·190. *Restoration of Kalyanarayudu tank*—(*Estimate, Rs.* 1,43,000).—Ayacut to be benefited: 470 acres. The expenditure incurred on the work during the year and to the end of the year was Rs. 5,128 and Rs. 98,927 respectively. The work was in progress. Programme for 1952–53, Rs. 8,000.

4·191. *Providing irrigation facilities to Vemuladevi Block V*—(*Estimate, Rs.* 1,55,500).—Ayacut to be benefited: 1,187 acres. The expenditure incurred on the work during the year and to the end of the year was Rs. 36,160. Programme for 1952–53, Rs. 73,000.

Visakhapatnam and Srikakulam Districts.—4·192. *Constructing a masonry dam across Saragudugadda in Vedurupalli village limits*—(*Estimate, Rs.* 1,01,484).—Ayacut to be benefited: 251 acres. The expenditure incurred on the work during the year and to the end of the year was Rs. 23,661 and Rs. 1,10,993 respectively. The work was completed except land acquisition.

4·193. *Constructing an anicut across Gosthani in Routhupalem village and a new head sluice with a connecting channel to join the existing Polipalli channel*—

(*Estimate, Rs.* 3,50,000 *for works and Rs.* 4,55,400 *including D. and I. charges*).—Ayacut to be benefited: 1,068 acres. The expenditure incurred on the work during the year and to the end of the year was Rs. 3,08,736 and Rs. 3,59,170 respectively. The head sluice was completed and anicut and channel were in progress.

4·194. *Constructing a reservoir across Varaha river in Ravanapalli village of Golugonda taluk*—(*Estimate, Rs.* 4,16,900 *for works and Rs.* 5,43,426 *including Direct and Indirect charges*).—Ayacut to be benefited 1,856 acres. The expenditure incurred on the work during the year and to the end of the year was Rs. 57,286. The work was in progress. Programme for 1952–53, Rs. 2,22,000.

4·195. *Construction an anicut across Ummigedda in Gadisingipuram of Parvatipur taluk*—(*Estimate, Rs.* 92,620 *for works and Rs.* 1,20,980 *including Direct and Indirect charges*).—Ayacut to be benefited, 660 acres. The expenditure incurred on the work during the year and to the end of the year was Rs. 15,034. Repairs to anicut, excavation of channel and construction of Addagedda syphon were in progress. Programme for 1952–53, Rs. 38,400.

4·196. *Constructing an outfall sluice on the left bank of Gokivadagedda at the infall of Upparagedda*—(*Estimate, Rs.* 17,059 *revised*).—Ayacut to be benefited: 110 acres. The expenditure incurred on the work during the year and to the end of the year was Rs. 6,767 and Rs. 11,858 respectively. The work was executed as a measure of relief to the submerged lands.

B. Other works—4·197. *Extending Dasamanthapuram high level distributory*—(*Estimate, Rs.* 16,000).—Ayacut to be benefited: 120 acres (new) and 100 acres (old). The work was in progress. Programme for 1952–53, Rs. 11,800.

Tank Improvement Schemes—4·198. Nearly 100 special repair works, in Godavari district, Visakhapatnam and Srikakulam districts were executed under tank improvement schemes during the year and an expenditure of Rs. 1,62,528 was incurred on these works to the end of the year. Programme for 1952–53, Rs. 1,00,000.

4·199 **Krishna District.**—*Restoration of Grandhivani tank of Madhavaram*—(*Estimate Rs.* 1,44,000).—Ayacut to be benefited: 280 acres. The expenditure incurred on the work during the year and to the end of the year was Rs. 16,413 and Rs. 1,73,450, respectively. The work was completed. L.A. charges. have to be adjusted.

Guntur District.—*A. Grow More Food Works*—4·200. *Constructing a calingulah across Yenugugaddavagu at Peddapuram*—(*Estimate, Rs.* 9,900).—Revised Estimate: Under sanction. Ayacut to be benefited: 139 acres. The expenditure incurred on the work during the year and to the end of the year was Rs. 5,769 and Rs. 19,206 respectively. The work was in progress.

4·201. *Constructing an anicut across Isukavagu.*—(*Estimate, Rs.* 40,100).—Ayacut to be benefited: 360 acres. The expenditure incurred on the work during the year and to the end of the year was Rs. 1,760 and Rs. 43,770 respectively. The work was completed.

4·202. *Bhrugubanda Project*—(*Estimate, Rs.* 1,65,000 *for works and Rs.* 2·15 *lakhs including D. and I. charges*).—Ayacut to be benefited: 490 acres (new) and 30 acres (existing). The expenditure incurred on the work during the year and to the end of the year was Rs. 24,124 and Rs. 1,75,505 respectively. The work was completed with the exception of some cross masonry works on the field bothies.

4·203. *Closing the breaches and repairing the bund of Gummalampadu Tank*—(*Estimate, Rs.* 36,300).—Ayacut to be benefited: 100 acres. The expenditure incurred on the work during the year and to the end of the year was Rs. 33 and Rs. 30,789. The work was completed.

4·204. *Constructing an anicut across Chilakaleru near Ramudupalem.*—(*Estimate, Rs.* 64,400).—Ayacut to be benefited: 360 acres. The expenditure incurred on the work during the year and to the end of the year was Rs. 10,968 and Rs. 66,017 respectively. The work was almost completed. Excavation of field bothies is to be completed.

4·205. *Improvements to Chapaya Chakraya Tank*—(*Estimate, Rs.* 31,250).—Ayacut to be benefited: 277 acres. The expenditure incurred on the work during the year and to the end of the year was Rs. 402 and Rs. 22,792. The work was completed.

4·206. *Improvements to Santamagulur tank—(Estimate, Rs.* 25,000).—Ayacut to be benefited: 100 acres. The expenditure incurred on the work during the year and to the end of the year was Rs. 3,724 and Rs. 7,731 respectively. The work was completed. Land acquisition charges have to be paid.

4·207. *Pedkandaleru Project—(Estimate, Rs.* 5,11,500 *for works and Rs.* 6,66,000) *including charges*).—Ayacut to be benefited: 300 acres (new) and 350 acres (existing). The expenditure incurred on the work during the year and to the end of the year was Rs. 57,267 and Rs. 5,43,688 respectively. The work was completed in all respects except the removal of hard rock projections in the bed of the supply channel. This work was in progress. Programme for 1952–53: Rs. 2,000.

4·208. *Raising the F.T.L. of Atmakur tank—(Estimate, Rs.* 1,54,000 *for work and Rs.* 2,03,100 *including charges*).—Ayacut to be benefited: 500 acres (new) and 460 acres (existing). The expenditure incurred on the work during the year and to the end of the year was Rs. 2,706 and Rs. 9,706 respectively, The originally sanctioned proposals were kept under abeyance. Leakages to surplus weir were closed. The work of providing a high level vent to the existing sluice was in progress. Programme for 1952–53, Rs. 97,000.

4·209. *Forming a tank across Nallavagu near Veelakonda and Konidena villages—(Estimate, Rs.* 5,44,400 *for works and Rs.* 7,13,745 *including Direct and Indirect charges*).—Ayacut to be benefited: 500 acres. The expenditure incurred on the work during the year and to the end of the year was Rs. 16,526 and Rs. 16,663 respectively. Masonry sluice No. I was completed. Masonry sluice Nos. II and III were in progress. Formation of tank bund was also in progress. Programme for 1952–53, Rs. 4,21,400.

4·210. *Forming a tank across Pulikuntavagu near Rajupalem—(Estimate Rs.* 81,200 *for works and Rs.* 1,00,850 *including Direct and Indirect charges.*—Ayacut to be benefited: 100 acres (new). The expenditure incurred on the work during the year and to the end of the year was Rs. 23,762 and Rs. 27,629 respectively. Tank bund, sluices, rough stone escape, grade wall and construction of bodicrossing were under execution. Programme for 1952–53, Rs. 10,800.

4·211. *Constructing an anicut across Chagalluvagu near Tondapi village—(Estimate, Rs.* 90,000 *for works and Rs.* 1,17,050 *including charges*).—Ayacut to be benefited: 300 acres (new) and 100 acres (existing). The expenditure incurred on the work during the year and to the end of the year was Rs. 3,160. Formation of flood bank, supply channel and repairs to the existing supply channel were in progress. Programme for 1952–53, Rs. 80,000.

4·212. *Providing irrigation facilities to Chilakapudi Kara agraharam—(Estimate, Rs.* 31,500).—Ayacut to be benefited: 1,000 acres. The expenditure incurred on the work during the year and to the end of the year was Rs. 5,405 and Rs. 6,014 respectively. The work was almost completed except few minor items to be carried out.

4·213. *Providing irrigation facilities to the lands under old Arthamur channel—(Estimate,* Rs. 9,300).—Ayacut to be benefited: 175 acres. The expenditure incurred on the work during the year and to the end of the year was Rs. 137 and Rs. 9,119 respectively. The work was completed.

4·214. *Providing irrigation facilities to Kothapalli block—(Estimate, Rs.* 22,000k —Ayacut to be benefited: 406 acres. The expenditure incurred on the wor). during the year and to the end of the year was Rs. 111. The work was in progress.

4·215. *Remodelling Bheemanadhi channel—(Estimate Rs.* 39,000).—The expenditure incurred on the work during the year and to the end of the year was Rs. 8,129. The work was in progress. Programme for 1952–53, Rs. 16,000.

Tank Improvement Schemes.—4·216. Two works under tank improvement schemes were completed during the year and the expenditure incurred on these works during the year and to the end of the year was Rs. 9,955 and Rs. 24,987 respectively.

Chingleput District.—*A. Grow More Food Works*—4·217. *Constructing a masonry retaining wall in Ozhalur River Channel—(Estimate, Rs.* 59,500 *for works and Rs.* 77,475 *including Direct Indircet charges*).—Ayacut to be benefited: 350 acres. Thoexpenditure incurred on the work during the year and to the end of the year was Rs. 2,773 and Rs. 47,923 respectively. The work was in progress. Programme for 1952–53, Rs. 3,000 for land charges.

4·218. *Improvements to Krishnapuram River Channel—(Estimate, Rs.* 10,000 *for works and Rs.* 13,154 *including Direct and Indirect charges*).—Ayacut to be benefited: 123 acres. The expenditure incurred on the work during the year and to the end of the year was Rs. 1,250 and Rs. 10,016 respectively. The work was completed.

4·219. *Improvements to Kinnivattagal III Reach—(Estimate, Rs.* 14,000)—*for works and Rs.* 18,215 *including Direct and Indirect charges*).—Ayacut to be benefited: 1,153 acres existing. The expenditure incurred on the work during the year and to the end of the year was Rs. 515 and Rs. 7,166 respectively. The work was completed. Programme for 1952–53, Rs. 2,500 land charges.

4·220. *Raising the F.T.L. of Illalur big and small tanks—(Estimate, Rs.* 18,215).—Ayacut to be benefited: 173 acres. The expenditure incurred no the work during the year and to the end of the year was Rs. 1,840 and Rs. 9,632 respectively. The work was in progress.

4·221. *Restoration of Chengalvaroya Naicker's Spring channel—(Estimate, Rs.* 28,494).—Ayacut to be benefited: 130 acres (old) and 56 acres (new). The expenditure incurred on the work during the year and to the end of the year was Rs. 2,007 and Rs. 6,218 respectively. The work is expected to be completed during 1952–53. Programme for 1952–53, Rs. 8,000.

4·222. *Constructing an anicut across Chavali Stream to improve supply to Kolathur Tank—(Estimate, Rs.* 68,000 *for works and Rs.* 88,473 *including D. and I. charges*).—Ayacut to be benefited: 260 acres. The expenditure incurred on the work during the year and to the end of the year was Rs. 28,549 and Rs. 42,692. The work was in good progress. Programme for 1952–53, Rs. 10,000.

4·223. *Improvements to Thirumukkudal Tank—(Estimate, Rs.* 18,215).—Ayacut to be benefited: 500 acres (existing). The expenditure incurred on the work during the year and to the end of the year was Rs. 3,124 and Rs. 8,206 respectively. The work was completed. Land acquisition charges are to be paid. Programme for 1952–53, Rs. 1,300.

4·224. *Improvements to Ottiambakkam tank—(Estimate, Rs.* 18,215).—Ayacut to be benefited: 150 acres. The expenditure incurred. on the work during the year and to the end of the year was Rs. 2,772. The work was started and stopped. Fresh proposals were under consideration. Programme for 1952–53, Rs. 11,200.

4·225. *Constructing a masonry retaining wall in Varadrajapuram village—(Estimate, Rs.* 35,000 *for works and Rs.* 45,574 *including D. and I. charges*).—Ayacut to be benefited: 370 acres existing. The expenditure incurred on the work during the year and to the end of the year was Rs. 2,700. The work was in progress. Programme for 1952–53, Rs. 25,000.

4·226. *Improvements and Restoration of Arudur Reddi tangal—(Estimate, Rs.* 34,860 *for works and Rs.* 44,645 *including D. and I. charges*).—Ayacut to be benefited: 50 acres. The expenditure incurred on the work during the year and to the end of the year was Rs. 310. The work was in progress. Programme for 1952–53, Rs. 27,000.

4·227. *Constructing a masonry retaining wall in the right margin of Athur Vadapathi channel—(Estimate, Rs.* 27,500).—Ayacut to be benefited: 697 acres existing. The expenditure incurred on the work during the year and to the end of the year was nil. The work was just started in 1952–53. Programme for 1952–53, Rs. 20,000.

4·228. *Restoring abandoned supply channel from Alikudi Odai*—(*Estimate, Rs.* 28,000).—Ayacut to be benefited: 349 acres. The expenditure incurred on the work during the year and to the end of the year was Rs. 12,050. The work was in progress. Programme for 1952–53, Rs. 12,000.

B. Other Works.—4·229. *Restoration of abandoned left flood bank of Araniar*—(*Estimate, Rs.* 2,03,500 *for work and Rs.* 2,40,890 *including Direct and Indirect charges*).—The expenditure incurred on the work during the year and to the end of the year was Rs. 71,885 and Rs. 1,38,418 respectively. The work was in progress. Programme for 1952–53, Rs. 90,000.

4·230. *Restoration of abandoned right flood bank of Araniar*—(*Estimate, Rs.* 2,75,000 *for works and Rs.* 3,58,080 *includiny, Direct and Indirect charges*).—The expenditure incurred on the work during the year and to the end of the year was Rs. 25,051 and Rs. 25,154 respectively. Of 1,720 units of earthwork, 450 units, were completed. Other works were in progress. Programme for 1952–53, Rs. 1,80,000.

Nellore District.—*A Grow More Food Works.* 4·231. *Improvements to Bhimavaram tank and excavation of a supply channel from Bodderu to Bhimavaram*—(*Estimate, Rs.* 97,000, *Revised estimate, Rs.* 1,41,000).—Ayacut to be benefited: 311 acres. The expenditure incurred on the work during the year and to the end of the year was Rs. 3,210 and Rs. 1,24,453 respectively. The work was completed. Land charges are only to be paid. Programme for 1952–53, Rs. 8,000.

4·232. *Upputeru Scheme*—(*Estimate, Rs.* 3,13,800 *for works and Rs.* 4,08,200 *including Direct and Indirect charges*).—Ayacut to be benefited: 860 acres (existing) and 943 acres (new). The expenditure incurred on the work during the year and to the end of the year was Rs. — 491 and 3,11,649 respectively. The work was completed. Only finishing items and land compensation charges remain to be paid. Programme for 1952–53, Rs. 38,100.

4·233. *Forming a new tank across Choutapallivagu near Bairavaram in Udayagiri taluk*—(*Estimate, Rs.* 3,03,650 *including Direct and Indirect charges*).—Ayacut to be benefited: 400 acres. The expenditure incurred on the work during the year and to the end of the year was Rs. 70,695 and Rs. 3,84,083. The work was completed. Only final bill and land compensation charges are to be paid. Programme for 1952–53, Rs. 3,000.

4·234. *Formation of a new tank in Nandipad village*—(*Estimate, Rs.* 99,950 *for works and Rs.* 1,20,373 *including Direct and Indirect charges*).—Ayacut to be benefited, 186 acres. The expenditure incurred on work during the year and to the end of the year was Rs 53,308 and Rs. 1,56,633 respectively. The work was completed. Only final bill and land charges are to be paid. Programme for 1952–53, Rs. 2,000.

4·235. *Restoration of Ramanaidupalli tank supply channel and construction of an anicut across Boggeru*—(*Estimate, Rs.* 2,74,450 *for works and Rs.* 3,57,360 *including Direct and Indirec charges*).—Ayacut to be benefited: 374 acres. The expenditure incurred on the work during the year and to the end of the year was Rs. 26,680 and Rs. 3,57,232. The work was almost completed. Programme for 1952–53, Rs. 2,000.

4·236. *Improvements to Kolladinne and Tummalapenta tanks by excavating supply channel for Mungamur tank supply channel on the left bank above the head sluice*—(*Estimate, Rs.* 1,68,300 *for works and Rs.* 2,19,150 *including Direct and Indirect charges*).—Ayacut to be benefited: 900 acres. The expenditure incurred on the work during the year and to the end of the year was Rs. 4,780 and Rs. 1,49,088 respectively. All works were completed. Land compensation charges are to be paid. Programme for 1952–53, Rs. 2,500.

4·237. *Forming a new tank across Marrivagu near Yerrakolu village*—(*Estimate, Rs.* 1,08,900).—Ayacut to be benefited: 80 acres. The expenditure incurred on the work during the year and to the end of the year was Rs. 63,631 and Rs. 1,38,734 respectively. The work was nearing completion. Programme for 1952–53, Rs. 11,000 for land charges, etc.

4·238. *Formation of a new tank across Nallavagu near Vedanamparthi village* (*Rapur taluk*)—(*Estimate Rs.* 39,600 *for works and Rs.* 46,839 *including D. and I. charges*).—Ayacut to be benefited: 175 acres. The expenditure incurred on the work during the year and to the end of the year was Rs. 53,073 and Rs. 1,29,227 respectively. The work was completed. Programme for 1952–53 Rs. 10,800 for land charges, etc.

4·239. *Improvements to Kanigiri big tank*—(*Estimate Rs.* 34,000 *for works and Rs.* 44,271 *includingD. and I. charges*)—Ayacut to be benefited: 52 acres. The expenditure Incurred on the work during the year and to the end of the year was Rs. 233 and Rs. 39,427 respectively. The work was completed.

4·240. *Improvements to Kanniampad tank*—(*Estimate Rs.* 33,000).—Ayacut to be benefited: 97 acres (existing) and 73 acres (additional). The expenditure incurred on the work during the year and to the end of the year was Rs. 469 and Rs. 41,208 respectively. The work was completed. Programme for 1952–53—Rs. 1,000 for land charges.

4·241. *Restoring Ragicheruvu in Chittalore village in Rapur taluk*—(*Estimate Rs.* 33,000).—Ayacut to be benefited, 25 acres. The expenditure incurred on the work during the year and to the end of the year was Rs. 16,193 and Rs. 27,199 respectively. The work was completed. Land compensation charges are to be paid. Programme for 1952–53—Rs. 1,200.

4·242. *Restoration of abandoned tank in Kakarlavaripalli*—(*Estimate Rs.* 18,900).—Ayacut to be benefited: 24 acres. The expenditure incurred on the work during the year and to the end of the year was Rs. 18,871 and Rs. 28,380 respectively. The work was completed. Programme for 1952–53—Rs. 1,000.

4·243. *Excavating a supply channel from Timmaleru to Pokkur tank*—(*Estimate Rs.* 63,800 *for works and Rs.* 83,000 *including D. and I. charges*).—Ayacut to be benefited: 435 acres (existing) and 200 acres (additional). The proposal consists of (1) excavation of a supply channel from Tammaleru and join the existing supply channel to Pokkur tank and (2) construction of a syphon and three bridges across the supply channel. The work was started during the year and in progress. The expenditure incurred on the work during the year and to the end of the year was Rs. 58,040. The work is expected to be completed during 1952–53. Programme for 1952–53—Rs. 5,000.

4·244. *Excavating a supply channel from North Amalur tank*—(*Estimate Rs.* 62,500 *for works and Rs.* 81,317 *including D. and I. charges*).—Ayacut to be benefited: 834 acres existing. The scheme consists of (1) excavating a new supply channel to North Amalur tank and forming earthen bund and (2) constructing a masonry weir and constructing a pipe culvert to cross Railway line. The expenditure incurred on the work during the year and to the end of the year was Rs. 13,906. The work was in progress. Programme for 1952–53—Rs. 3,600.

4·245. *Improving supply to Tallapalam and Musanur tanks and constructing an anicut across Chippaleru*—(*Estimate Rs.* 81,400).—Ayacut to be benefited: 2,500 acres existing. The scheme is designed to construct an anicut across Chippaleru and restore Undvakalva. The expenditure incurred on the work during the year and to the end of the year was Rs. 69,998. The work was in progress. It is expected to be completed during the year 1952–53. Programme for 1952–53—Rs. 2,000.

4·246. *Improving supply to Zalladanki tank*—(*Estimate Rs.* 51,500 *for works and Rs.* 67,000 *including D. and I. charges*).—Ayacut to be benefited: 179 acres (additional.) The scheme consits of (1) constructing an anicut across Chippaleru for feeding Zalladanki tank and (2) constructing a syphon across Chippaleru. The expenditure incurred on the work during the year and to the end of the year was Rs. 10,518. The work was started during the year and was in progress. Programme for 1952–53—Rs. 31,500.

Tank Improvement Schemes—4·247. Seventy works in Chingleput Division and 104 works in Special Irrigation Division (all in chingleput district) were under execution and the expenditure incurred during the year in Chingleput district was

Rs. 4,11,029. A few works were also under execution in Nellore Division and the expenditure incurred in the division during the year was Rs. 11,770. Therefore the total expenditure incurred on Tank Improvement Schemes was Rs. 4,22,799. Programme for 1952-53—Rs. 3,00,000.

South Kanara District.—*A. Grow More Food Works*—4·248. *Construction of an anicut across Nape channel, a tributary of Kharingote river at Ramanchira*—(*Estimate Rs.* 52,043).—Ayacut to be benefited : 110 acres. Anicut with up and down stream aprons was completed. Revetments were being raised and banks on either side were formed. The surplus escape on the left side was also completed. The expenditure Incurred on the work during the year and to the end of the year was Rs. 35,007 and Rs. 35,099 respectively. Programme for 1952-53—Nil.

4·249. *Improvements to Chandra Madaga*—(*Estimate Rs.* 39,761).—Ayacut to be benefited, 243 acres. The expenditure incurred on the work during the year and to the end of the year was Rs. 11,423 and Rs. 31,023 respectively. The work was completed.

4·250. *Improvements to Herekere tank*—(*Estimate Rs.* 61,150).—Ayacut to be benefited : 170 acres. The expenditure incurred on the work during the year and to the end of the year was Rs. 9,483 and Rs. 15,474 respectively. The work was in progress. Programme for 1952-53—Rs. 2,500.

4·251. *Constructing an anicut across Mulki river at Phalimar*—(*Estimate Rs.* 2,54,230).—Ayacut to be benefited, 143 acres (new) and 577 acres (existing). Anicut was completed, except fitting up of shutters. Right and left side channels were excavated for a length of about 6 furlongs on either side. The expenditure incurred on the work during the year and to the end of the year was Rs. 1,02,993 and Rs. 1,12,964 respectively. Cross masonry works are yet to be done and revetments have to be raised. Programme for 1952-53, Rs. 65,000.

4·252. *Constructing a dam across Pavanjithodu*—(*Estimate Rs.* 98,882 *Revised estimate Rs.* 1,34,978).—Ayacut to be benefited ; 220 acres. The expenditure incurred on the work during the year and to the end of the year was Rs. 50,914 and Rs. 91,220 respectively. The work was completed and brought into beneficial use.

4·253. *Construction of Shiriyar Anicut and excavation of Main Canal*—(*Estimate Rs.* 6,81,780).—Ayacut to be benefited : 549 acres. The expenditure incurred on the work during the year and to the end of the year was Rs. 69,130 and Rs. 5,37,770 respectively. The work was completed.

4·254. *Improvements to Kotekere tank*—(*Estimate Rs.* 18,267).—Ayacut to be benefited : 112 acres. The expenditure incurred on the work during the year and to the end of the year was Rs. 8,010 and Rs. 10,504 respectively. The work was nearing completion. Programme for 1952-53, Rs. 1,000.

4·255. *Improvements to Hunthankere*—(*Estimate Rs.* 15,568).—Ayacut to be benefited : 26 acres. The expenditure incurred on the work during the year and to the end of the year was Rs. 19 and Rs. 12,208 respectively. The work was completed.

4·256. *Improvements to Thalamakkikeri*—(*Estimate Rs.* 14,323).—Ayacut to be benefited : 54 acres. The expenditure incurred on the works during the year and to the end of the year was Rs. 52 and Rs. 10,294 respectively. The work was completed.

4·257. *Construction of an anicut in S. No.* 65 *of Madamakki village*—(*Estimate Rs.* 8,850).—Ayacut to be benefited : 30 acres. The expenditure incurred on the work during the year and to the end of the year was Rs. 4,035 and Rs. 4,514 respectively. The work was completed.

4·258. *Improvement to Mudabettu tank*—(*Estimate Rs.* 13,011).—Ayacut to be benefited : 41 acres. The expenditure incurred on the work during the year and to the end of the year was Rs. 1,469. The work was completed. Programme for 1952-53—Rs. 5,000.

4·259. *Improvements to Maskibail tank*—(*Estimate Rs.* 9,570).—Ayacut to be benefited : 30 acres. The expenditure incurred on the work during the year and to the end of the year was Rs. 4,028 and Rs. 7,031 respectively. The work was nearing completion. Programme for 1952-53—Rs. 200.

4·260. *Forming a new tank at Govindoor*—(*Estimate Rs.* 53,952).—Ayacut to be benefited : 57 acres. The expenditure incurred on the work during the year and to the end of the year was Rs. 14,559. The work was in progress and nearing completion. Programme for 1952-53—Rs. 21,500.

4·261. *Imporvements to Halthodu Madaga*—(*Estimate Rs.* 31,461).—Ayacut to be benefited : 85 acres. The expenditure incurred on the work during the year and to the end of the year was Rs. 9,991. The work was in progress and nearing completion. Programme for 1952-53—Rs. 14,200.

4·262. *Improvements to Kanjarkatta tank*—(*Estimate Rs.* 8,500).—Ayacut to be benefited : 34 acres. The expenditure incurred on the work during the year and to the end of the year was Rs. 2,045. The work was in progress and nearing completion.

Malabar District.—*A. Grow More Food Works*—4·263. *Constructing a bund across Murivayar thodu in Mangalam village for preventing influx of salt water*—(*Estimate Rs.* 22,118).—Ayacut to be benefited : 205 acres (existing). The work was in progress.

4·264. *Constructing an outfall sluice at Chalat in R. S. No.* 36-7 *Cannanore*—(*Estimate Rs.* 5,800).—Ayacut to be benefited : 80 acres. Work postponed as the land acquisition was not settled.

4·265. *Improvement to the Punjakole lands—Eannakkal Dam*—(*Estimate Rs.* 20,000).—Ayacut to be benefited : 250 acres. The work was in progress.

4·266. *Vented dam in Thalikulam (village)—Ponnani taluk*—(*Estimate Rs.* 7,491).—Ayacut to be benefited : 27·99 acres. The work was in progress.

4·267, *Construction of outfall sluice in R. S. No.* 84 *of Engandiyur village*—(*Estimate Rs.* 13,650).—Ayacut to be benefited : 115 acres. The work was in progress.

4·268. Small Grow More Food schemes numbering 27, costing a total amount of Rs. 1,30,152 were executed during 1951-52. The approximate ayacut to be benefited by them will be 4,941 acres. Additional food production to be achieved after completion of the above schemes will be 1,149 tons.

Coimbatore District.—*A Grow More Food Works*—4·269. *Extention of irrigation under Punjathalayar branch in Nanjathalayar*—(*Estimate Rs.* 50,000 *for works and Rs.* 65,054 *including D. and I. charges*).—The proposal is toextend the irrigation under the Punjathalayar branch of Nanjathalayar channel for benefiting an extent of about 140 acres besides the existing ayacut. The expenditure incurred on the work during the year and to the end of the year was Rs. 20,894. The work was in good progress. Programme for 1952-53—Rs. 20,000.

B. Other works—4·270. Estimate for the improvements and special repairs to the following channels in Pollachi taluk were sanctioned. They were taken up for execution during the year. The total cost of the works are detailed below :—

	Remodelling of channels—Improvements. (Estimated Amount.)		Remodelling of channels (Special repairs.)
	Rs.		Rs.
Perianai channel	25,650	Perianai channel	42,200
Areapuram channel	17,570	Pallivilangal channel	19,800
Pallivilangal channel	5,550		
Karapatti channel	10,175		
	58,945		62,000

4·271. *Formation of Surianallur tank*—(*Estimae Rs.* 30,780).—Ayacut to be benefited : 50 acres. It is proposed to form this tank across a jungle stream called 'Mamangam Odai' situated to the west of Surianallur village, Dharapuram taluk. The expenditure incurred on the work during the year and to the end of the year was Rs. 12,537 and Rs. 25,588 respectively. The work was in progress.

4·272. *Improvements of Kathanganni tank*—(*Estimate Rs.* 27·389).—Ayacut to be benefited : 60 acres. The proposals is to raise the F.T.L., of the tank by 2' by raising the weir and raising and strengthening of the tank bund and constructing a new high-level sluice. The expenditure incurred on the work during the year and to the end of the year was Rs. 7,331 and Rs. 17,289 respectively. The work was in progress.

Tank Improvement Schemes.—4·273/ Eight works in Coimbatore district, and eight works in Salem district, and a few works in North Arcot district were executed under Tank Improvement Schemes during the year 1951–52. The total expenditure incurred on tank improvement schemes during the year and to the end of the year was Rs. 65,456 and Rs. 1,51,373 respectively. Programme for 1952–53—Rs. 43,900.

Tanjore district.—*A. Grow More Food Works* : 4·274. *Formation of a flood bank on the right side of Kannanar*—(*Estimate* : *Rs.* 30,479.)—Ayacut to be benefited : 90 acres (new) and 761 acres (old). The expenditure incurred on the work during the year and to the end of the year was Rs. 15 261 and Rs. 18,761 respectively. The earth work was almost completed. The revetment work and balance of land acquisition were in progress. Programme for 1952–53—Rs. 9,000.

Tank Improvement Schemes.—4·275. The investigation and excution works were confined to Tindivanam taluk and a small portion of Villupuram taluk. One hundred and ten estimates were prepared and 103 were sanctioned. Forty-eight works were in progress besides 51 completed. The expenditure incurred during the year and to the end of the year was Rs. 1,49,419 and Rs. 4,13,372—Programme for 1952–53—Rs. 1,50,000.

Tiruchirappalli district.—*A.Grow More Food Works*—4·276 *Restoratian of Kaikalathur tank in Kaikalathur village in Perambalur taluk*—(*Estimate Rs.* 1,92,000).—Ayacut to be benefited : 350 acres. The work of forming bund, constructing left and right flank sluices, excavating supply channel closing breaches and constructing surplus weir were completed. Excavation of left flank sluice channel was nearing completion. The expenditure incurred on the work during the year and to the end of the year was Rs. 48,745 and Rs. 76,714 respectively. Construction of cross drainage in the left flank sluice was in progress. Programme for 1952–53 : Rs. 18,000.

4·277 *Improvements to Puthur Peria Eri*—(*Estimate Rs.* 65,100.).—Ayacut to be benefited : 120 acres. (existing) and 70 acres (new). Construction of anicut and head sluice was completed. Earthwork for the formation of flood bank and supply channel was almost completed. All items in the outlet work were also completed except roughstone dry packing for revetment. The expenditure incurred on the work during the year and to the end of the year was Rs. 8,149 and Rs. 38,589 respectively. The work of improvements to the byewash and weir along remains to be done. Programme for 1952–53—Rs. 4,000.

4·278 *Canstruction of an anicut across Uppar in Thaluthalapatti village and excavating a rightside channel.*—(*Estimate Rs.* 84,727).—Ayacut to be benefited : 263 acres. The expenditure incurred on the work during the year and to the end of year was Rs. 3,100. The work was started and in progress. Programme for 1952–53 :—Rs. 60,000.

Madurai district.—*A. Grow More Food Works*:—4·279 *Raising the F.T.L. by 2' of Maithalamannadikulam tank*—(*Estimate* : *Rs.* 52,000).—Ayacut to be benefited : 222 acres (existing) and 133 acres (New). All connected works were nearing completion. The expenditure incurred on the work during the year and to the end of the year was Rs. 15,001 and Rs. 15,099 respectively. Programme for 1952–53—Rs. 2,600.

4·280 *Improvements to Mullipadi Periakulam anicut supply channel*—*Estimate* : *Rs.* 20,000).—The expenditure incurred on the work to the end of the year was Rs. 19,419. The work was completed.

4·281. *Restoration of anicut at the head of supply channel to Anaikulam across the Santhavarthin river and constructing a head sluice*—(*Estimate* : *Rs.* 16,500).—Ayacut to be benefited : 258 acres (existing) and 91 acres (new). This is to restor the damaged portion of anicut across the stream at the head of supply channel to Anaikulam and constructing head sluice to the supply channel. The work was not taken up for execution during the year and it is expected to be taken up during 1952–53.

4·282. *Repairs and improvements to Chakkilichikulam anicut and supply channel in Periakulam taluk*—(*Estimate* : *Rs.* 13,800)—Ayacut to be benefited : 156 acres (existing) and 50 acres (new). The proposal is to construct an anicut across the Nagalar odai and excavating a new supply channel to Chakkilichikulam. The expenditure incurred on the work during the year and to the end of the year was Rs. 2 490. Construction of anicut and head sluice was completed. Supply channel was being excavated. Programme for 1952–53.—Rs. 11,800.

Tirunelveli District.—*A. Grow More Food Works* : 4·283.—*Restoration of Sivalaperi tank*—(*Estimate* : *Rs.* 3,90,500).—Ayacut to be benefited : 550 acres. The scheme consists of restoration of an old abandoned tank by forming the tank-bund with necessary sluices and surplus works. The expenditure incurred on the work during the year and to the end of the year was Rs. 37,460 and Rs. 3,15,231 respectively. The work was completed except acquisition of lands in Kodaiankulam village. No programme for 1952–53. Grant for Rs. 34,800 applied.

4·284. *Improvements to Sadayaneri tank and supply channel.*—(*Estimate Rs.* 42,000.)—Ayacut to be benefited : 210 acres (existing). The scheme provides for a head sluice with screw-gearing shutters for regulation at the head of the supply channel with suitable flood banks upstream of the anicut channel. The expenditure incurred on the work during the year and to the end of the year was Rs. 26,769 and Rs. 31,872 respectively. The work was in progress. Programme for 1952–53 : Rs. 7,400.

Ramanathapuram District.—*B. Other works*—4·28. Constructing scouring sluice at the right flank and forming a connecting bund to the proposed site of scouring sluice and opening an inlet sluice in the crossbund in Kollamkondan tank, Estimate :Rs. 18,800 (Original), Rs. 24,800 (Revised) Ayacut to be benefited : 878 acres (existing). The expenditure incurred on the work during the year and to the end of the year was Rs. 1,320 and Rs. 22,778 respectively. The work was completed in all respects.

Tank Improvement Schemes.—4·2860 Eight works (4 in Madurai district and 4 in Ramanathapuram district) were taken up under Tank Improvement Schemes during the year and an expenditure of Rs. 12,251 was incurred on these works during the year. Of the 304 small tank improvement schemes contemplated to be taken up in Tirunelveli district, 40 works were completed, 144 works were under execution and 120 works remain to be investigated. The expenditure incurred on these works during the year and to the end of the year was Rs. 1,21,463 and Rs. 2,21,946. Programme for 1952–53—Rs. 1,49,200.

Chittoor District—*A. Grow More Food Works*: 4·287? *Constructing an anicut across Chinna Eru and excavating a supply channel at Thambalapalle* :—(*Estimate* : *Rs.* 40,000 *for works and Rs.* 47,257 *including D. and I. charges.*—Ayacut to be benefited : 60 acres. The expenditure incurred on the work during the year and to the end of the year was Rs. 13,007. The work was in good progress Programme for 1952–53—Rs. 12,000.

Bellary District—*B. Other Works*: 4·288—*Bhairavanitippa project—Estimate* Rs. 86,76,800 *for works and Rs.* 1,01,66,400 *including D and I charges.*—Ayacut to be benefited 8,000 acres. The project provides for the construction of a reservoir across the Hagari river just above Bhairvanitippa village. This is a major river valley project sanctioned for execution, as Post-War Development scheme.

Inaguration ceremony of this project was done on 28th December 1951. Due to an agreement with Mysore being under correspondence and not having been finalised the work could not be proceeded with. Nothing tangible could be therefore done during the year under report, except acquisition of small stores., etc. The expenditure incurred on the work during the year and to the end of the year was Rs. 11,719. Programme for 1952–53. : Rs. 1,84,600.

Tank Improvement Schemes.—4·289. Forty-nine works in Anantapur district, 29 works in Bellary district, 15 works in Kurnool district, 15 works in Cuddapah district, and 37 works in Chittoor district were carried out under Tank Improvement Schemes during the year. A total expenditure af Rs. 2,52,867 was incurred on these works during the year.

Kurnool district.—*A. Grow More Food Works*—4·290. *Restoration of Perur tank of Boyadangumpala*—(*Estimate Rs.* 54,000 *of works and Rs.* 71,696 *including D. and I. charges*)—Ayacut to be benefited 115 acres. The expenditure incured on the work during the year and to the end of the year was Rs. 11,227 and Rs. 67,080 respectively. The work was completed and brought into beneficial use. Programme for 1952–53: Rs. 17,80 to meet the liabilites still outstanding.

4·291. *Excavation of Harivaram channel from mile* 124/8 *K.C. channel to irrigate lands in Bhimunipedu, etc., villages* (*Estimate Rs.* 72,500 *for works and Rs.* 94,253 *including D. and I. charges.*—Ayacut to be benefited 885 acres. The work was started on 2nd July 1951 and brought into beneficial use from 26th December 1951. But some masonry works connected with the channel were being constructed. The expenditure incurred on the work during the year and to the end of the year was Rs. 35,024. Programme for 1952–53, Rs. 34,000 to meet outstand ng liabilities.

4·292. *Restoration of Ramatheertham tank* (*Ex-Banganapalle State*)—(*Estimate Rs.* 89,000).—Ayacut to be benefited : 274 acres. The final alignment of channel was over. Work on the pick-up anicut was started and foundation excavated. The expenditure incurred on the work during the year and to end of the year was Rs. 5,517 and Rs. 51,834 respectively. The work of raising bund by 2½ remains to be done. Programme for 1952–53 : Rs. 27,000.

Cuddapah District. *Grow More Food Works*: 4·293.—*Restoration of Kanchalamma tank of Rayachoti taluk*—(*Estimate Rs.* 393,790).—Ayacut to be benefited : 104 acres. Revised Estimate 4·79 lakhs for works is pending with Government.

Chapter V.

Tungabhadra Project Headworks.

5·01. Sri K. V. Ekambaram, B.E., I.S.E., continued to be in charge of the Headworks Circle with four Executive Engineers under him throughout the year except for a short period from 8th September to 10th October 1951 when he was on leave, during which period Sri K. R. Rajagopalan, A.M.I.E., G.I.E.E. (Lond). Executive Engineer, Construction Division, No. II was in full additional charge of the Circle. Sri K. Gopala Iyengar, B.E., continued to be the Superintending Engineer, Machinery Circle.

5·02. The Project Camp was maintained in good repair with all the amenities provided for the efficient working of the staff and labour force. New buildings, such as, quarters for the Electricity Department staff (D.E.E. & A.E.E.), Mechanics' and Foreman's quarters and sheds for stone dressers, etc. started last year were completed during the year. A Circuit House was built on the top of the hillock at the right flank of the dam and a connecting ghat road from the foot of the hill was laid. The foundation stone for the Circuit House was laid by the then Minister for Public Works, Sri M. Baktavatsalam in May 1951.

5·03 Work on the diversion of the submersible portion of the Mysore Frontier road in the reservoir waterspread was going on according to programme and about 90 per cent of the earthwork and 50 per cent of the masonry works were done. The first seven miles of this road will become ready for traffic shortly.

5·04. Excavation of foundations for the dam together with drilling and grouting low and high pressure holes in the foundation trench was completed during the year. The total excavation done was about 12·56 m.c. ft.

5·05. The following special features were encountered in the course of excavation and treatment of foundations for the dam. In two places round about L.S. 1250 and L.S. 1400, the rock surface was found to be highly weathered and soft. Deepening the foundation at these places by about 12 feet to 13 feet revealed hard pegmatite with a soft vein carrying in thickness from 3 to 6 inches running in centre of the pits. In the case of the pit at L.S. 1250, this vein was not continuous as in the case of the vein in the pit at L.S. 1400 where it stopped at the epidiorite rock at the rear toe. The seams were cleared thoroughly and holes drilled and grouted to refusal. Similarly a soft pocket commencing from about 10 feet from the axis of the dam and extending right up to the rear toe with an average width of 25 feet was found at L.S. 1000. The portion was deepeend by about 25 feet at which depth, the width of the soft pocket had narrowed down to 6 feet and the nature of the rock exposed had also improved. The excavation was stopped at this level and holes were drilled to a depth of 20 feet and grouted to refusal. All foundation work was completed by end of September 1951.

5·06. *Masonry in river-bed reach.*—At the close of the working season of 1951 the dam in the river-bed reach (blocks 22 and 23) was brought to a level of plus 1,545 and block 24 to a level of plus 1,533. Bulkheads in the reaches from L.S. 700 to 1636 and L.S. 1,900 to 2,400 covering the Roya and Basavanna channel sections were the dam had not risen high were put in to about plus 1,570 to prevent the floods. Work was resumed in blocks 22 and 23 in the river bed on 15th September 1951 by diverting the low flows through block 24. On 4th February 1952 the low river flow was turned through the construction sluices and masonry in block 24 taken up after forming a ring bund in front. The three river-bed blocks would have risen to plus 1570 before the floods arrive in July 1952. The maximum flood discharge during the year was 141,425 cusecs which occurred on 27th July 1951 and the M.F.L. at dam site attained was 1,560·8.

5·07. *Masony in other reaches.*—Laying of masonry for the dam was continued vigorously both in the spillway and non-spillway portions. The outturn went on steadily increasing as more working space become available, reaching a peak outturn of 357 units per day on 28th March 1952. Baffle wall in rear of spillway and in continuation of horizontal bucket portion using specially dressed massive stones was contructed to a length of 630 feet. Concrete was laid for the drainage gallery and constraction joints. The full length of drainage gallery was completed. The masonry is being built partly departmentaly and partly on contract.

The total masonry laid during the year in various proportions and to various levels was as follows :—

	During the year. Units.	Total to end of the year. Units.
(1) R.C.M. 1 : 2½	14,105	23,861
(2) Do. 1 : 4	34,506	57,190
(3) Do. 1 : 2	37	156
(4) Do. 1 : 5	2,413	2,811
(5) Lime surki mortar	20,008	28,718
	71,059	112,736 or 11¼ m.c.ft.
(6) Concrete	2,245	4,373
Total ..	73,314	117,109 or 11·72 m.c.ft.

The cumulative total masonry done to end of March 1952 was 11¼ m.c. ft. which represents 70 per cent of the quantity to be done in the length of dam taken up by Madras. The dam has come up almost to the top both in the spillway and the

non-overflow sections in certain reaches. Owing to some delay in the manufacture of penstock pipes in the Jog Workshops of the Indian Hume Pipe Company, the Hydro-Electric and river sluices reach between L.S. 1336 and 1636 could not be raised well above the M.F.L. anticipated during 1952. Hence a bulkhead with impervious core and masonry facing as revetment was being formed with its top well above the expected flood level.

5·08. *Appurtenant works.*—The river surplus channel from the Basavannah Roya stilling basin up to the river out-fall sluices was excavated while the channel from the river sluices stilling basin up to river channel was in progress together with the construction of regulators, drops, bridges, etc. The channel was being lined.

5·09. The usual tests on mortar for strength permeability and shrinkage were continued in the field laboratory at the dam site.

5·10. Progress on collection of materials such as stone, sand, surki, lime, etc., was satisfactory and there was sufficient reserve stock. The supply of cement was insufficient at times and this was made good by borrowing every now and then. In spite of the best efforts, no reserve stock of cement could be built up.

5·11. The workshop was maintained in proper order doing servicing jobs and repairs to all kinds of machinery and vehicles employed on the project. The hangar for the gate manufacturing shop was being erected. The embedded metal castings for the sluices were machined and fitted at site. The manufacture of the penstock pipes was started in Jog and these were being conveyed for installation in the dam one by one by road. Tenders for hoists of spillway gates, Goliath Crane, etc., were invited and they were being scrutinized.

5·12. The strength of labour at the camp was about 12,000. With the anti-malarial measures continued vigorously the health and sanitation of the Project colony was satisfactory.

5·13. The villagers in the submergible area were provided with huts at the rehabilitation centres, Venkatapuram, Danapuram and H.B. Halli. Wells were also being dug at these centres for water-supply. Preparation of plans and estimates was taken up for providing new feeder roads from H.B. Halli to Hampasagaram and Tambarahalli whose existing communications will be cut off by the reservoir submersion.

5·14. There were eight cases of fire accidents and 65 cases of general accidents during the year of which one was fatal and the rest were ordinary. Timely medical aid was given to the injured and action taken to get compensation, etc., sanctioned.

5·15. Supply to the Roya channel which was till now being made through a temporary sluice in the dam would hereafter be allowed from the combined Basavannah-Roya sluice in the dam. For this purpose the Basavannah channel was widened to take the combined supply and a new feeder channel with head sluice and drops excavated from the Basavannah to Roya channel about half a mile below the dam.

CANALS.

5·16. Sri A. R. Venkataraman, B.A., B.E., I.S.E., continued to be in charge of the Canals Circle throughout the year with five Executive Engineers in charge of Divisions under him.

5·17. *Power canal.*—Work was in good progress in the entire length of canal, except for about three furlongs length at the end which will be taken up when the Electricity department finalize their forebay proposals. All the deep cuts were virtually completed and substantial work had been done on the embankment. Machinery was used to a considerable extent. The embankment reach between mile 3/0 to 4/0 and the Kondanayakanahalli deep cut between mile 5/5 to 6/7 were tackled and they were nearing completion. Lining of the canal in sections was taken up especially in Hospet town limits. All the of cross drainage works, road and

railway bridges, outlet sluices, irrigation syphons and trough aqueducts were taken up for construction. A few of them were completed and work on the rest was pushed through.

5·18. *Low-level canal.*—A new subdivision was formed for investigating the canal below mile 173/3 and the Kurnool branch.

5·19. Excavation of the canal was completed from mile 12/0 to 173/3 except for a few gaps here and there, work on which was proceeding rapidly. As regards the first 12 miles which is in difficult country the heavy embankment reaches were being tackled by machinery. The side walling and rock cutting reaches were nearing completion. The R.C. aqueduct across the first valley was almost completed while the work on the arched aqueduct across the second valley was in good progress. The canal cuts through a hill in the 6th mile and here a tunnel 1,170 ft. long is proposed. Tunnel work taken up departmentally had progressed for about 180 ft.

5·20. Most of all the cross drainage work and bridges were completed and work was in good progress on the sluices and other masonry works. The several types of masonry works constructed and in progress to the end of the year were as follows:—

	Completed.	In progress.	Total.
(1) Under-tunnels and aqueducts	93	40	133
(2) Regulators	2	3	5
(3) Bridges	60	23 + 5	83 + 5
(4) Escapes	1	4	5
(5) Head sluices	..	8	8
(6) Super passages	..	1	1
(7) Drops	..	8	8

5·21. The Hagari Aqueduct was completed in all respects and it was being tested for water tightness. The accompanying photos show some of the canal works.

5·22. *Localization.*—After completing localization of ayacut to the west of the Hagari river localization to the east of the river was taken up. Excavation of 10 distributaries together with the construction of masonry works thereon was in progress and about 21 miles length of distributaries was so far completed in all respects.

5·23. The several departmental and contractors' labour camps were properly maintained and looked after. With all the amenities provided and with the free medical aid anti-malarial measures being continued, the health of the population in the several camps was satisfactorily maintained in coordination with the Public Health and Medical departments.

5·24. *Accident.*—There were 38 accidents during the year of which 12 were fatal, three resulting in permanent disablement and the rest temporary disability. Timely medical aid was given and action taken to get compensation, etc., sanctioned.

5·25. *Floods.*—Minor flood damages occurred to a few temporary buildings in some of the canal camps. Action was taken to rectify the damages.

5·26. *Programme for the year* 1952–53—*Dam.*—The masonry construction of the dam will be pushed through and the dam raised to its top in all sections. The penstock pipes will be fixed in the dam and all appurtenant works completed to enable water to be issued for irrigation in June 1953. Progress in the manufacture of spillway gates will be maintained. The dam would be nearly completed in all respects except fixing of the spillway gates and hoists.

5·27. *Canals.*—All the incomplete masonry works will be completed and excavation of the entire canal up to 173rd mile including the tunnel will be finished. Localization of 75 per cent to 80 per cent of the area and excavation of all major distributaries will be achieved. Water will be allowed for irrigation from June 1953.

5·28. Work below the 173rd mile of the canal will be taken up.

5·29. With the storage impounded in the reservoir it is possible to allow water for second-crop cultivation in the Krishna Delta from January to April 1953.

5·30. The expenditure incurred during the year and up to the end of the year are Rs. 345·1 lakhs and Rs. 1,176·46 lakhs respectively.

Chapter VI.

A. Season, rainfall and supply.

6·01. *Willingdon Reservoir—Toludur Project.*—The north-east monsoon was not a success in general during the year, but the system channels received adequate supplies.

6·02. *Cauvery Delta System.*—The water-supply position in this delta, taking into account the storage at Mettur Dam, the rainfall in the Plateau of Mysore and of local rainfall, was not very satisfactory. However, by judicious and careful regulation and by observing turns, it was possible to send down the required supplies.

6·03. *Cauvery-Mettur Projeet.* Due to the failure of monsoon, the storage in the reservoir was very low and was causing anxiety during the transplantation of single crop. The rainfall in November 1951, though a bit late, helped a great deal.

6·04. *Godavari Delta System.*—Water-supply throughout the first-crop season was sufficient and uniformly satisfactory and transplantation was done without any difficulty. In the last week of July 1951 there were very heavy rains and the area adjoining the drains were spoiled due to submersion. To compensate this loss, 51,661·25 acres (Godavari Western Delta 30,914 acres, Godavari Central Delta 11,022 acres and Godavari Eastern Delta 9,725·25 acres) were thrown open for second crop under additional areas. Due to dearth of water-supply during second-crop season, many ryots resorted to unauthorized irrigation and about an extent of 7,788 acres of unauthorized irrigation was detected and reported to the Collector. Internal turns were resorted to and water-supply made to the extent available. There was no cyclone during the year under report. The maximum flood level over the crest of Dowlaishwaram anicut was 12·1 feet on 11th August 1951 (6 a.m.) against 8·2 on 28th July 1950 last year.

6·05. *Nagavalli System.*—The main channel was opened on 15th June 1951 for first crop. Due to the failure of timely rainfall, the water level in the river had fallen below the bed-level. Water was supplied by raising koramboos. The total area irrigated under the system was 27,303 acres.

6·06. *Srikakulam Minor River System.*—The total area irrigated under this system was 52,350 acres. Water regulation was carried out on turn system and there was no difficulty.

6·07. *Krishna Delta System.*—Freshes in the river Krishna were received on 4th June 1951 and the maximum flood level of 57·75 was observed on 31st July 1951. The supply was copious during the year. Due to early rains, there was ample water in the Krishna river. The transplantation season commenced in the first week of June 1951 and closed by the end of August 1951. There were no rains in the latter part of the irrigation season, but with the water reserve in the river, there was no difficulty for irrigation. The branch channels under Krishna Eastern Bank canal were kept opened up to 30th November 1951. In general, the season passed off without complaints and the crop yield also was above average expectations.

6·08. The Muniyeru river received its first freshes on 21st June 1951 at 12 o'clock at night and a maximum level, plus 228·20 was reached on 25th July 1951 at 11·00 a.m. The head sluice was opened for irrigation on 15th June 1951 at 6·00 p.m. and closed on 16th January 1952 at 6·00 p.m.

6·09. *Pennar River Canals System.*—The rainfall in the upper catchment of Pennar river and in the Nellore district was below normal and much difficulty was experienced in raising crops. There were not adequate freshes in Pennar river and consequently the crop in the major portion of the delta in Sangam and Nellore had dried away for want of water. There was no second crop. The average rainfall per station in delta was 1·86 inches against 3·29 inches in the previous year. The maximum rainfall recorded in 24 hours was 5·66 inches at Swerapalli. The maximum water level over Nellore anicut was 3·6 feet on 8th June 1951 and minimum discharge in the main channel was 21·80 cusecs on 8th July 1951.

6·10. The north-east monsoon was a failure this year also, being the fifth year in succession. Due to the failure of monsoon, the water levels in Red Hills, Cholavaram and Satyamurthi Sagar (Poondi Reservoir) did not reach F.T.L. and were very low and even insufficient to meet the demands of the Madras Corporation. No water was issued to irrigation under Red Hills and Cholavaram tanks. The maximum water level during the year in the Red Hills lake was 36·52 feet on 1st April 1951, that in Poondi reservoir was 123·25 feet on 1st April 1951 and that in Chembarambakkam tank was only 1·7 feet.

6·11. The water level in the Mopad reservoir was 1·9 feet at the commencement of irrigation season. The reservoir was able to supply water to an extent of 8,500 acres.

6·12. *Ceded districts.*—The rainfall was poor in Chittoor, Cuddapah and Kurnool districts during the year and the conditions of drought prevailed through the Chittoor and Cuddapah districts. Due to adverse seasonal conditions, the whole of Rayalaseema excepting a few taluks was declared as famine affected area and many famine relief works were started to provide employment to the affected people. The rainfall in Bellary and Anantapur districts was normal except certain taluks in Anantapur district. The production of dry crop was fair.

6·13. *Periyar System.*—The Periyar lake was opened for irrigation on 1st June 1951 when the lake level was at 126·30. The lake level rose very early to F. T.L. in south-west monsoon, the level being 159·95 on 30th July 1951. Supply to the single crop was given on 1st August 1951. Both the monsoons were good and the lake started surplusing on 2nd October to 8th October, for 18 days in November, and 6 days in December. As there was ample supply continuously, supply was given till the 26th February 1952, when the lake was closed with a level of 130·35. A special supply was given to Cumbum valley from 2nd March 1952 to 10th March 1952 and the lake was finally closed on 11th March 1952 with a level of 131·70. The Periyar canal was closed on 28th February 1952.

6·14. The rainfall was normal. The rainfall in 1951–52 in Periyar lake catchment was 94·40, 36·99 in Cumbum valley and 37·09 in Periyar Delta against 72·36, inches 23·07 inches and 23·83 inches respectively, the average rainfall for 1950–51 in the corresponding areas. The monsoon was good and no difficulty was experienced in the provision of water facilities to the Periyar Delta System.

B. Closure of canals.

6·15. *Godavari delta.*

Name of canal.	Date of closure.	Date of opening.
Godavari Western Delta	5th May 1951, 6 a.m. ..	8th June 1951, 6 p.m.
Godavari Central Delta	22nd April 1951, 6 a.m. ..	22nd May 1951, 6 p.m.
Godavari Eastern Delta	5th May 1951, 6 a.m. ..	5th June 1951, 6 p.m.
Dummagudem Canal	30th April 1951 ..	30th June 1951.

(Dummagudem canal which is to be closed on 15th April 1950 6 p.m. was kept open till 6 p.m. on 24th April 1950 to relieve congestion)

6·16. *Krishna Delta.*

	Date of closing.
Krishna Western Main Canal ..	15th March 1951, 6 p.m.
Krishna Eastern Main Canal ..	15th April 1951.

6·17. *Ceded Districts.*

	Closure.	Opening of.
K.C. Canal traversing in Kurnool district.	16th April 1951.	16th June 1951.
K.C. Canal traversing in Cuddapah district—Rajely anicut to Adinimayappalli anicut.	Not closed.	

Chapter VII.

PROJECTS UNDER PLANNING AND INVESTIGATION.

Tanjore District.

7·001. *Construction of a footbridge across Paminiar at mile* 70/21—(*Estimate Rs.* 11,580).—The scheme has been sanctioned.

7·002. *Excavation of a channel from Pattuvanchi Drain.*—Alternative proposals were called for from the Superintending Engineer and they were awaited.

7·003. *Better utilization of monsoon flows by raising and strengthening the banks of the Grand Anicut Canal, etc.*—Plans and estimates were awaited from the Superintending Engineer.

7·004. *Provision of irrigation facilities in Andikulum and Melavasal villages.*—(*Estimate Rs.* 11,400).—Ayacut to be benefited: 230 acres. Plans and estimates were under scrutiny in Chief Engineer's (Irrigation) office.

South Arcot District.

7·005. *Extension of irrigation on the left side of Vadavar*—(*Estimate Rs.* 1·10 *lakhs*).—Ayacut to be benefited: 1,000 acres. The scheme was sanctioned.

7·006. *Restoration of a portion of Periapatlur channel*—(*Estimate Rs.* 63,350).—Ayacut to be benefited: 200 acres. Plans and estimates were under scrutiny in Chief Engineer's (Irrigation) office.

7·007. *Opening a new sluice and channel in Miralur village*—(*Estimate Rs.* 13,200).—Ayacut to be benefited: 200 acres. The scheme was sanctioned.

East Godavari District.

7·008. *Providing irrigation facilities to dry lands in Madhavapatnam village.*—Sanction of Government was awaited.

7·009. *Extending Madhavarayudupalem channel.*—The proposals were under scrutiny in circle office.

7·010. *Yeleru Reservoir Scheme*—(*Estimate Rs.* 2,75,00,000).—Ayacut to be benefited: 35,000 acres. Preliminary proposals were sent to Government.

7·011. *Cherukulanka Scheme*—(*Estimate Rs.* 1,45,000).—Ayacut to be benefited: 700 acres. Preliminary proposals were sent to Government.

Visakhapatnam and Srikakulam districts.

7·012. *Gambheramgedda Reservoir Scheme*—(*Estimate Rs.* 10,27,480).—Ayacut to be benefited: 1,250 acres. The investigation of the scheme was completed and the detailed plans and estimates were submitted to Government for sanction.

7·013. *Mamidipalli Gedda Anicut Scheme*—(*Estimate Rs.* 12,03,000).—Ayacut to be benefited: 7,078 acres. The detailed investigation of the scheme was completed and plans and estimate were under preparation.

7·014. *Makkuvagedda Anicut Scheme*—(*Estimate Rs.* 8,61,500).—Ayacut to be benefited: 11,000 acres. The detailed investigation of the scheme was deferred.

7·015. *Rallagedda Anicut Scheme*—(*Estimate Rs.* 3,45,113).—Ayacut to be benefited: 494 acres. The detailed investigation of the scheme was completed and plans and estimate were under scrutiny in circle office.

7·016. *Surapadu Anicut Scheme*—(*Estimate Rs.* 5,51,000).—Ayacut to be benefited: 1,850 acres. The investigation of the scheme was completed. Plans and estimate were under scrutiny in Chief Engineer's (Irrigation) Office.

7·017. *Nagavalli R.B. Channel from Thotapalli Regulator across Nagavalli Regulator*—(*Estimate Rs.* 8,96,600).—Ayacut to be benefited: 9,000 acres. The detailed investigation of the scheme was completed and plans and estimate were under preparation.

7·018. *Vonigedda Anicut Scheme*—(*Estimate Rs.* 8,90,000).—Ayacut to be benefited: 3,011 acres. The investigation was completed and plans and estimate were under scrutiny in Chief Engineer's (Irrigation) office.

7·019. *Padiyam Scheme*—(*Estimate Rs.* 12,49,000).—Ayacut to be benefited: 3,454 acres. The detailed investigation of the scheme was completed and the plans and estimate were under scrutiny in Chief Engineer's (Irrigation) Office.

7·020. *Seethanagaram Anicut Scheme*—(*Estimate Rs.* 7,96,000).—Ayacut to be benefited: 4,217 acres. The detailed investigation of the scheme was completed and plans and estimate were under preparation.

7·021. *Vegavathi Anicut Scheme*—(*Estimate Rs.* 19,02,000).—Ayacut to be benefited: 7,950 acres. Plans and estimate were under scrutiny in Chief Engineer's (Irrigation) office.

7·022. *Gummidigedda Reservoir Scheme*—(*Estimate Rs.* 9,00,000).—Ayacut to be benefited: 3,000 acres. The detailed investigation of the scheme was completed and plans and estimates were under preparation.

7·023. *Vottigedda Reservoir Scheme*—(*Estimate Rs.* 12,36,000).—Ayacut to be benefited: 6,000 acres. The detailed investigation of the scheme had to be taken up.

7·024. *Alternative Scheme for constructing a regulator across Nagavalli River at Panasanandivada*—(*Estimate Rs.* 35,00,000).—Ayacut to be benefited: 3,000 acres. The detailed investigation of the scheme was in progress.

7·025. *Gadigummi Reservoir Scheme.*—(*Estimate Rs.* 43,04,000).—Ayacut to be benefited: 4,050 acres. The detailed investigation of the scheme was completed and plans and estimate were under scrutiny.

7·026. *Alternative Scheme to Maddurthi Anicut Scheme*—(*Estimate Rs.* 11,93,000).—Ayacut to be benefited: 1,915 acres. The investigation of the scheme was completed and plans and estimate were under scrutiny in Chief Engineer's office.

7·027. *Vamsadhara Reservoir Scheme*—(*Estimate Rs.* 7,59,00,000).—Ayacut to be benefited: 3,00,000 acres. The detailed investigation of 3 sites (selected) was completed and skeleton estimate and plans were prepared.

7·028. *Mandagedda Anicut Scheme*—(*Estimate Rs.* 1,66,000).—Ayacut to be benefited: 350 acres. The detailed investigation of the scheme was completed and proposals were under scrutiny in circle office.

7·029. *Gostani Reservoir Scheme*—(*Estimate Rs.* 32,90,000).—Ayacut to be benefited: 12,840 acres. The detailed investigation of the scheme was taken up.

7·030. *Gottipalli Reservoir Scheme*—(*Estimate Rs.* 3,12,000).—Ayacut to be benefited: 1,300 acres. The detailed investigation of the scheme was in progress.

7·031. *Shifting the head of Kasapurambathi of Bahuda River System*—(*Estimate Rs.* 32,000).—Ayacut to be benefited: 750 acres (existing) and 25 acres (additional) plans and estimate were under scrutiny in circle office.

7·032. *Forming a Flood Bank on the left margin of Bahuda River and to protect the ayacut of Dukkapotanna tank from tidal and saline action*—(*Estimate Rs.* 52,000).—Ayacut to be benefited: 225 acres. Plans and estimate were under scrutiny in circle office.

7·033. *Providing drainage facilities and constructing an outfall sluice in Uddanam area*—(*Estimate Rs.* 1,56,000).—Ayacut to be benefited: 600 acres. Plans and estimate were under scrutiny in circle office.

7·034. *Janjhavathi Reservoir Scheme*—(*Estimate Rs.* 75,34,000).—Ayacut to be benefited: 29,000 acres. The gaugings were being conducted since 10/50. The detailed investigation of the scheme was taken up.

7·035. *Jamparakotagedda.*—The gaugings were conducted and the feasibility of the scheme was being considered.

Krishna and Guntur Districts.

7.036. *Vaivaka and Korukollu Scheme*—(*Estimate Rs.* 17,000).—Ayacut to be benefited: 600 acres. Gaugings were conducted during 1950 and 1951 and a final report on the results of the gaugings was awaited from the Superintending Engineer.

7·037. *Forming a tank across Ogeru*—(*Estimate Rs.* 3,53,000).—Ayacut to be benefited: 260 acres. Proposals were submitted to Government.

7·038. *Gundalakamma Project* (*Constructing a reservoir near Tangirala*)—(*Estimate Rs.* 140 *lakhs*) (*approximate*)].—The scheme was under consideration of Government.

7·039. *Raising Konkeru Dam and Improving the storage of Pedakancherla tank by letting more water from Konkeru*—(*Estimate Rs.* 1 *lakh.*)—Detailed proposals were under scrutiny by the Executive Engineer.

7·040. *Extending irrigation facilities on the right side of Muniyeru by constructing a head sluice on the right side of Polampalli anicut*—(*Estimate Rs.* 3 *lakhs*).—Ayacut to be benefited: 1,500 acres. Detailed proposals were under scrutiny by the Executive Engineer.

7·041. *Constructing masonry Katwas across surplus courses of Santhamagaluru tank*—(*Estimate Rs.* 60,000).—Ayacut to be benefited: 70 acres. Proposals were under scrutiny in circle office.

7·042. *Budameru Scheme*—(*Estimate Rs.* 60,00,000).—Ayacut to be benefited: 12,999 acres. The proposals were with Government.

7·043. *Pulivagu project*—(*Estimate Rs.* 1,50,000).—Ayacut to be benefited: 1,000 acres. The proposals were under preparation by the Subdivisional Officer.

7·044. *Raising the F.T.L. of Kottur tank*—(*Estimate Rs.* 76,000).—Ayacut to be benefited: 400 acres. The proposals were under scrutiny in circle office.

7·045. *Bhatrupalem Project*—(*Estimate Rs.* 50,000).—Ayacut to be benefited: 200 acres. The scheme was proposed to be inspected by the Superintending Engineer before any proposal was formulated.

7·046. *Mellavagu Project across Naguleru*—(*Estimate Rs.* 4,32,000).—Ayacut to be benefited: 600 acres. Sanction of Government to the proposal is awaited.

7·047. *Pittambanda Project*—(*Estimate Rs.* 49,000).—Ayacut to be benefited: 100 acres. Detailed proposals were under scrutiny in circle office.

7·048. *Alavala Tank Project*—(*Estimate Rs.* 1,25,000).—Ayacut to be benefited: 140 acres. Preliminary proposals were under scrutiny in Chief Engineer's (Irrigation) office.

7·049. *Constructing a dam across Pasupuleru near Chatragaddapalem*—(*Estimate Rs.* 16,000).—Ayacut to be benefited: 270 acres. The proposals were under examination in the circle office.

7·050. *Pilleru Scheme*—(*Estimate Rs.* 1 *lakh roughly*).—Ayacut to be benefited: 400 acres. Proposals were under scrutiny in circle office.

7·051. *Garikapadu Scheme*—(*Estimate Rs.* 1,30,000 *roughly*).—Ayacut to be benefited: 120 acres. The proposals were under examination.

7·052. *Eduru and Pedathakagudipadu tanks* (*Improvements*).—The proposal was under examination in circle office.

7·053. *Restoration of abandoned tank near Rangirala.*—The proposal was under examination in circle office.

7·054. *Forming a reservoir across Yerravagu in Trilochanapuram village*—(*Estimate Rs.* 2,30,000).—Ayacut to be benefited: 200 acres. The proposal was under examination in circle office.

7·055. *Vallurgavu Scheme.*—The scheme was under examinatien by the Executive Engineer.

7·056. *Aluri tank scheme.*—The scheme was under examination by the Executive Engineer.

7·057. *Kondayapalem tank scheme*—(*Estimate Rs.* 65,000).—Ayacut to be benefited: 400 acres. The scheme was under examination by the Executive Engineer.

7·058. *Chigurupadu scheme*—(*Estimate Rs.* 1,71,000).—Ayacut to be benifited: 100 acres. The scheme was under examination by the Executive Engineer.

7·059. *Formation of the tank near Maddulur*—(*Estimate Rs.* 30,000).—The proposal was under correspondence with the Collector.

7·060. *Improvements to Magallur channel*—(*Estimate Rs.* 50,000).—Ayacut to be benefited: 200 acres. The scheme was proposed to be inspected by the Superintending Engineer before any proposals were formulated.

7·061. *Sanagapadu channel improvement scheme.*—Remodelling proposals were under preparation by the Subdivisional Officer.

7·062. *Forming a tank near Yerragundipadu village.*—Detailed proposals were under examination by the Executive Engineer.

7·063. *Kondavagu scheme*—(*Estimate Rs.* 2,52,000).—Ayacut to be benefited: 270 acres. The proposals were pending with the Collector.

7·064. *Temmipuram scheme*—(*Estimate Rs.* 60,000).—Ayacut to be benefited: 150 acres. The proposals were pending with the Collector.

7·065. *Pedda Naidu tank scheme.*—The proposals were pending with the collector.

7·066. *Formation of Mulapadu tank.*—The investigation of the scheme has to be taken up.

Chingleput District.

7·067. *Constructing an anicut across Cooum below the off-take of Ayanambakkam supply channel.*—It was decided that the preparation of model design of the anicut and aprons should be tested at Poondi Research Station before adoption. A report on the same was awaited from the Research Station Executive Engineer.

7·068. *Dam across Vegavathi river in Solobogam.*—The scheme was deferred.

7·069. *Excavating a supply channel from Uttiramerur tank to Edamanch I.*—The scheme was dropped.

7·070. *Providing a masonry dam in place of mud dam in Puducheri village.*—An estimate for Rs. 24,600 for the work was under scrutiny in the Superintending Engineer's office.

7·071. *Construction of a retaining wall at the head of Budur supply channel.*—An estimate for Rs. 38,000 was under scrutiny in Chief Engineer's (Irrigation) office.

7·072. *Constructing an anicut across Adyar and excavating a supply channel to Velacheri tank.*—Government had addressed the Government of India to advise the local military authorities to permit Public Works Department for putting up trial pits for deciding about the feasibility of the project. Reply was awaited.

Nellore District.

7·073. *Forming a reservoir across Kaveri vagu below its confluence with Choutapalli vagu.*—Plans and estimates were awaited from the Executive Engineer, Special Irrigation Division.

7·074. *Excavating a supply channel from Paleru to Bitragunta.*—Plans and estimate were awaited (re-submission) from the Executive Engineer, Nellore Division.

7·075. *Improvements to Kampasamudram tank.*—The scheme was pending sanction of Government.

7·076. *Gandipalem scheme.*—The proposals were pending with Executive Engineer, Nellore Division.

7·077. *Nakkalagandi and Uppalavagu schemes.*—Particulars and the site survey for the cross-drainage works and channels were being collected by the Executive Engineer, Special Irrigation Division.

7·078. *Raising the F.T.L. of Survepalli reservoir.*—The scheme was under investigation.

7·079. *Reclamation of Allur swamp.*—The scheme was recommended to Government for detailed investigation.

7·080. *Improving supply to Vasili tank.*—The scheme was dropped.

7·081. *Excavation of supply channel from Boggeru to Nandavaram and Dasabandam and Yerra cheruvu.*—Proposals were submitted to Government for sanction.

7·082. *Forming a tank across Neralla vagu.*—Plans and estimate were under scrutiny in Superintending Engineer's office.

7·083. *Closing breaches and improving the old tanks in Chinnakaniampad across Savativagu.*—Plans and estimate were submitted to Government for sanction.

7·084. *Supply channel from Mullakantiyeru to Chilakapad.*—The Executive Engineer, Special Irrigation Division, was asked to conduct detailed investigation of the scheme.

7·085. *Providing irrigation facilities to land colonization scheme in Veligandla and Chintalavadi villages.*—The schemes were deferred for the present.

7·086. *Forming a tank across Lingala vagu.*—Plans and estimate returned to the Executive Engineer, Special Irrigation Division, were awaited from him.

7·087. *Constructing an anicut across Ubbala vagu at Adireddipalem and excavating a supply channel to Bitragunta Vankanna tank.*—The scheme was under examination.

7·088. *Formation of tank across Garalla vagu.*—The scheme was deleted.

Paleru Project.—The project was under examination in Special Irrigation Division.

7·089. *Forming a tank in Sankavaram village.*—The scheme has been sanctioned.

7·090. *Excavating a supply channel to Udayagiri tank from Bodigundala vagu.*—Proposals were awaited from the Executive Engineer, Special Irrigation Division.

7·091. *Forming a new tank across Narella vagu at Peddamanchur to irrigate Turkapalli, etc., villages.*—Proposals were awaited from the Superintending Engineer.

7·092. *Forming a small reservoir across Velikanteru in Chikavalu.*—Investigation of the scheme had to be taken up.

7·093. *Formation of a tank across Alapalleru.*—The investigation of the scheme had to be taken up.

7·094. *Restoration of Bommavaram irrigation channel.*—The scheme was deleted.

7·095. *Forming a small reservoir across Pyderu.*—The scheme was dropped.

7·096. *Krishna-Pennar project.*—The following is the brief record of work done on the investigation of the project during the year 1951–52.

7·097. *Krishna dam.*—The major item of exploratory work that was continued at the dam site was calyx drilling work. During the year, the drilling work was concentrated in the bed portion in summer and in the left flank during the flood season. Due to the peculiar geological formation at the site the location of a suitable alignment for the dam at which good rock is found at suitable depths required extensive drilling work. A number of holes (6 numbers making up a total of 415 r.ft.) were put in at the left flank to locate the best alignment involving the minimum depth of rock for foundation. During the year, 17 holes comprising of 95·4 r.ft. making a total of 6,338 r.ft.) were drilled in the river bed and left flank of the dam line.

7·098. Apart from the collection of hydrological and meteorological data, analysis of soil and water samples also continued.

7·099. *Pennar dam site at Someswaram.*—Exploratory work consisting of calyx drilling, penetrometer, hand-boring, well-sinking, blasting, quarrying and grouting and clay injection were continued during the year. Four calyx drill holes totalling a depth of 191 feet (70 feet in hard rock were drilled during the year along the proposed dam line).

7·100. *Mylavaram dam.*—At Mylavaram dam site calyx drilling operations were in progress. So far 15 drill holes were completed.

7·101. *Canals.*—All preliminary surveys, designs and estimates were completed. Fixing of centre line stones has been nearly completed. Block levels for typical branches and distributaries under Krishna-Pennar West and [illegible] Pennar South canal and Cuddapah South canal were started and are in different stages of progress.

7·102. *Technical Committee.*—The Technical Committee of the Planning Commission visited the sites of the dams in February and have been since studying the details of the project.

South Kanara District.

7·103. *Construction of an anicut across Guruppu river (Estimate Rs. 11·20 lakhs).*—Ayacut to be benefited : 1,547 acres. Plans and estimate were scrutinised. Government were addressed to state their present financial policy and whether this scheme could be taken up as a Non-Grow More Food work.

7·104. *Construction of an anicut across Pavanje river at Challiyar (Estimate Rs. 2·471 lakhs).*—Ayacut to be benefited : 563 acres. Plans and estimate have been returned to the Superintending Engineer with remarks.

7·105. *Constructing an anicut across Kandaka river (Estimate Rs. 42,500).*—Ayacut to be benefited : 162 acres. The scheme was under investigation.

7·106. *Improvements to Kavoor tank (Estimate Rs. 47,800).*—Ayacut to be benefited : 243 acres. The proposals were dropped.

7·107. *Improvements to Urumbi tank (Estimate Rs. 1,14,585).*—Ayacut to be benefited : 182 acres. Field particulars were being collected and the estimate was awaited from the Subdivisional Officer.

7·108. *Kattinahole Reservoir Scheme (Estimate Rs. 16 lakhs).*—Ayacut to be benefited : 1,300 acres. Estimate for pick-up anicut and channel was prepared. Estimate for the reservoir will be prepared after boring operations are conducted.

7·109. *Hadvinagudde anicut across Sankadagundi river* (*Estimate Rs.* 38,000).—Ayacut to be benefited : 200 acres. Plans and estimates were under scrutiny in Chief Engineer's (Irrigation) Office.

7·110. *Improvements to Sorkal tank* (*Estimate Rs.* 57,377).—Ayacut to be benefited : 66 acres. The scheme was sanctioned.

7·111. *Restoration of Maidanakeri tank* (*Estimate Rs.* 31,000)—Ayacut to be benefited : 60 acres. Proposals were dropped.

7·112. *Restoration of Dhalantriya tank* (*Estimate Rs.* 26,200).—Ayacut to be benefited : 100 acres. Estimate was sent to Government.

7·113. *Restoration of Havanji tank* (*Maipady tank*) (*Estimate Rs.* 20,000).—Ayacut to be benefited : 100 acres. Estimate was sent to the Board of Revenue for remarks. The work had since been transferred to the Superintending Engineer, Food Production, for necessary action.

7·114. *Restoration of Shiriyar Madaga* (*Estimate Rs.* 41,684).—Ayacut to be benefited : 222 acres. Estimate sent to Government for sanction.

7·115. *Timiri Reservoir Scheme.*—Preliminary report was under scrutiny in Superintending Engineer's office.

7·116. *Constructing an anicut across Shiriya in Bombrana village.*—Plans and estimate were returned to the Superintending Engineer for revision and re-submission.

7·117. *Reservoir across Dasankatanahole.*—The scheme was under detailed investigation.

Coimbatore District.

7·118. *Chickarasampalayam Scheme.*—The proposal is to form a reservoir by constructing a dam across the Thannipallam and to divert the water from Kanavoikombaipallam. All field particulars were gathered and trial borings along the alignment of dam were taken.

7·119. *Tirumurthy Hill Reservoir Project.*—The detailed investigation of the scheme was sanctioned by Government and it will be taken up during 1952–53.

7·120. *Aliyar Reservoir Scheme* (*Estimate Rs.* 54 *lakhs*).—Ayacut to be benefited : 5,000 acres. The supplies available for storage in Madras State limit was being examined.

7·121. *Amaravathi Reservoir Project* (*Estimate Rs.* 272·31 *lakhs*).—Ayacut to be benefited : 15,000 acres. Sanction of Government was awaited.

7·122. *Vattamalai Reservoir Scheme* (*Estimate Rs.* 17·20 *lakhs*).—Ayacut to be benefited : 900 acres dry cultivation. The scheme was sanctioned. The work is to be started after specific orders of Government are received.

7·123. *Uppar Reservoir Scheme* (*Estimate Rs.* 38 *lakhs*).—Ayacut to be benefited : 3,000 acres (dry irrigated crop). The scheme was under investigation.

7·124. *Improvements to Dommanagadda anicut* (*Estimate Rs.* 1,42,590)—Ayacut to be benefited : 275 acres. Proposals were dropped for the present.

Nilgiris District.

7·125. *Construction of an anicut across Hallur Halla* (*Estimate Rs.* 17,200).—Ayacut to be benefited : 75 acres. Plans and estimate were awaited from the Superintending Engineer.

7·126. *Construction of an anicut and restoration of Oorakarai Venkatarama Chettiyar channel* (*Estimate Rs.* 1,63,000).—Ayacut to be benefited : 300 acres. Plans and estimate were returned to the Superintending Engineer for revision and re-submission.

North Arcot District.

7·127. *Construction of a dam across Ponniar at Sathanur* (*Estimate Rs.* 225·5 *lakhs*).—Ayacut to be benefited : 20,000 acres. Sanction of Government was awaited.

Salem District.

7·128. *Thoppiar Reservoir Project* (*Estimate Rs.* 59,96,183).—Ayacut to be benefited : 2,335 acres. Proposals were dropped.

7.129. *Restoration of Omalur eastern anicut* (*Estimate Rs.* 29,000 *approximately*).—Ayacut to be benefited : 200 acres. The scheme was under detailed investigation.

7·130. *Nagiampatti Scheme, etc.* (*Estimate Rs.* 60,000).—Ayacut to be benefited : 200 acres. The Executive Engineer was asked to submit a further report on the subject.

7·131. *Kalpaganur Scheme* (*Estimate Rs.* 3,00,000).—Ayacut to be benefited : 1,000 acres. Plans and estimate were awaited from the Superintending Engineer.

7·132. *Improvements to Hamrapuram tank* (*Estimate Rs.* 4·21 *lakhs*).—Ayacut to be benefited : 250 acres. The Superintending Engineer was asked to investigate the alternative proposals.

7·133. *Constructing a tank in Kaveripanai village, etc.* (*Estimate Rs.* 2,81,500).—Ayacut to be benefited : 700 acres. Gauge readings and discharge calculations were sent to the Superintending Engineer.

7·134. *Restoration of a breached anicut across Varathar in Thammampatti village* (*Estimate Rs.* 50,000)—Ayacut to be benefited : 800 acres. The scheme was under detailed investigation.

7·135. *Forming a small tank across Manjapalli odai* (*Estimate Rs.* 50,000).—Ayacut to be benefited : 210 acres. Result of gaugings were being examined.

7·136. *Constructing an anicut across Swethanadhi in Viraganur limits* (*Estimate Rs.* 2,25,000).—Ayacut to be benefited : 345 acres. Detailed investigation had to be taken up.

7·137. *Constructing an anicut across Vasishtanadhi in Manivilandan village* (*Estimate Rs.* 3,00,000).—Ayacut to be benefited : 1,000 acres. Gauging were being conducted.

7·138. *Forming a reservoir across Chinnara tributary of Ponniar in Krishnagiri* (*Estimate Rs.* 59·38 *lakhs*).—Ayacut to be benefited : 1,190 acres (new) and 1,842 acres (existing). Plans and estimate were under scrutiny in Chief Engineer's (Irrigation) office.

7·139. *Krishnagiri Reservoir Project* (*Estimate Rs.* 131·00 *lakhs*).—Ayacut to be benefited : 7,500 acres of new area. Plans and estimate were under scrutiny in Chief Engineer's (Irrigation) Office.

7·140. *Restoration of the abandoned Balamaneri tank in Anamala Halla in Dharmapuri taluk* (*Estimate Rs.* 91,075).—Ayacut to be benefited : 100 acres. Estimate was sent to Government for sanction.

7·141. *Forming a reservoir across Pambar* (*Estimate Rs.* 40 *lakhs*).—Ayacut to be benefited : 2,500 acres. The scheme was investigated. Plans and estimate were awaited from the Superintending Engineer.

Malabar District.

7·142. Approximately fifteen Grow More Food Schemes were under consideration in this district.

Anantapur District.

7·143. *Restoration of Kothacheruvu of Peddannavaripalli village* (*Estimate Rs.* 3·5 *lakhs*).—Ayacut to be benefited : 400 acres. The scheme was under investigation as an ordinary Grow More Food Scheme by the Executive Engineer.

7·144. *Restoring Marutla tank and improving supplies to Lakkavaram* (*Estimate Rs.* 0·84 *lakhs*).—Ayacut to be benefited : 120 acres. Proposals received from the Superintending Engineer were examined and further particulars were called for from him.

7·145. *Mid-Pennar Prjoect* (*Estimate Rs.* 150 *lakhs*).—Ayacut to be benefited : 8,000 acres. Proposals since received from the Superintending Engineer were being scrutinized in Chief Engineer's (Irrigation) office.

7·146. *Dharigallu Project* (*Estimate Rs.* 11·24 *lakhs*).—Ayacut to be benefited : 1,000 acres. The field work was completed and proposals were awaited from the Executive Engineer.

7·147. *Restoration of Gantimarru tank* (*Estimate Rs.* 2·03 *lakhs*).—Ayacut to be benefited : 200 acres. Proposals were submitted to Government for sanction.

7·148. *Restoration of Uppalapadu Peddacheruvu of Kadiri taluk* (*Estimate Rs.* 0·655 *lakhs*).—Ayacut to be benefited : 60 acres. Proposals were submitted to Government for sanction.

7·149. *Chinnarayaswamygudi Reservoir Scheme* (*Estimate Rs.* 14·38 *lakhs*).—Ayacut to be benefited : 1,500 acres. The final work was completed and proposals were being formulated by the Executive Engineer.

7·150. *Restoration of Gulyam tank* (*Estimate Rs.* 0·68 *lakhs*).—Ayacut to be benefited : 115 acres. Certain particulars were called for from the Superintending Engineer.

7·151. *Restoration of Peddacheruvu of Somyajalapalli* (*Estimate Rs.* 1·17 *lakhs*).—Ayacut to be benefited : 100 acres. The preliminary report on the scheme was under scrutiny in Superintending Engineer's office.

Cuddapah District.

7·152. *Formation of a tank at Kammavaripalli* (*Estimate Rs.* 1·20 *lakhs*).—Ayacut to be benefited : 100 acres. The local officers' report on soil particulars was awaited.

7·153. *Lower Sagileru Project* (*Estimate Rs.* 44·73 *lakhs for works*).—Ayacut to be benefited : 3,000 acres. Proposals were submitted to Government for sanction. Government sanctioned the earth-work relating to canals portion of this project as a famine relief work.

7·154. *Restoration Kambasamudram tank near Chitval* (*Estimate Rs.* 6·40 *lakhs*).—Ayacut to be benefited : 400 acres. Alternative proposal was under examination by the Executive Engineer.

7·155. *Excavating a left bank supply channel from Nagavaram anicut* (*Estimate Rs.* 0·6 *lakhs*).—Ayacut to be benefited : 90 acres. The scheme was investigated in detail and recommended to Government to be dropped.

7·156. *Construction of a reservoir across the Pinchanadi and Cheyyeru* (*Estimate for Penchanadi reservoir Rs.* 20 *lakhs*).—Ayacut to be benefited : 2,400 acres. The scheme was under investigation by Executive Engineer (Estimate for Cheyyeru reservoir : Rs. 21 lakhs.) Ayacut to be benefited : 2,400 acres. The investigation of the scheme has to be taken up.

7·157. *Restoration of an anicut across Mebalakunta eru near Mysorevaripalli* (*Estimate Rs.* 0·8 *lakhs*).—Ayacut to be benefited : 100 acres. The scheme was under investigation by the Executive Engineer.

Bellary District.

7·158. *Restoration of Benikal tank* (*Estimate Rs.* 2·42 *lakhs*).—Ayacut to be benefited : 300 acres. Plans and estimate were scrutinized. A report was sent to Government to take up the scheme when the land colonization scheme was finalized.

7·159. *Hagari-Bommanahalli Project* (*Estimate Rs.* 70·00 *lakhs*).—Ayacut to be benefited 7,350 acres. Proposals were submitted to Government for sanction

7·160. *Krishna Reddi tank or Kottapali Project* (*Estimate Rs.* 0·30 *lakhs*).—Ayacut to be benefited : 290 acres (existing). The scheme was investigated. Proposal was returned to the Executive Engineer with certain remarks.

Chittoor District.

7·161. *Kalyani Reservoir Project in Chandragiri taluk* (*Estimate Rs.* 17·00 *lakhs*).—Ayacut to be benefited : 1,600 acres. Proposals were submitted to Government for sanction.

7·162. *Constructing an anicut across the Swarnamukhi river at Kalahasti* (*Estimate Rs.* 6,134.—Ayacut to be benefited : 5,278 acres (existing) and 1,788 acres (new). The scheme was sanctioned by the Government.

7·163. *Construction of an anicut across Kalinga river* (*Estimate* Rs. 12·98 *lakhs*).—Ayacut to be benefited : 2,546 acres (existing) and 500 acres (new). The work of excavation of an open head supply channel from the Kalinga river to feed Katoor and four other tanks was sanctioned by Government to give immediate relief to the ryots. Proposals for the balance of work returned to the Executive Engineer with certain remarks.

7·164. *Constructing an anicut across Pinchanadi and augmenting supply of Agraharam Peddacheruvu* (*Estimate Rs.* 1·56 *lakhs*).—Ayacut to be benefited : 463 acres (existing) and 130 acres (additional). Proposals were returned to the Executive Engineer with certain remarks.

7·165. *Nimmanapalli Reservoir Scheme* (*Estimate Rs.* 26·00 *lakhs*).—Ayacut to be benefited : 5,000 acres. Gaugings were being conducted to determine the availability of water in the river.

7·166. *Siddalagandi tank in Vayalpad taluk* (*Estimate Rs.* 1·25 *lakhs*).—Ayacut to be benefited : 100 acres. The investigation of the scheme is expected to be completed after clearance of forest growth on the tank-bund and water-spread area.

7·167. *Construction of an anicut at Mallimadgu at the off-take of supply channel* (*Estimate Rs.* 5·00 *lakhs*).—Ayacut to be benefited : 1,908 acres (existing) and 649 acres (new). Gaugings were being done in Rallakalva.

7·168. *Construction of an anicut across the Bahuda at the head of Pathakota kalva at Manchu village* (*Estimate Rs.* 32,000).—Ayacut to be benefited : 71 acres (existing) and 14 acres (new). Plans and estimate were under preparation by local officers.

7·169. *Bheemanadhi Reservoir Scheme* (*Estimate Rs.* 3,84,800).—Ayacut to be benefited : 360 acres including 147 acres (existing). Proposals were dropped.

Kurnool District.

7·170. *Restoration of Mondikatta tank near Sanjeevaraopet village* (*Estimate Rs.* 1·45 *lakhs*.).—Ayacut to be benefited : 200 acres. Proposals were submitted to Government for sanction.

7·171. *Rallavagu and Gandivagu Reservoir Scheme* (*Estimate Rs.* 3·90 *lakhs*).—Ayacut to be benefited : 1,200 acres. Proposals were dropped.

7·172. *Forming a reservoir across Bhavanasi near Atmakur* (*Estimate Rs.* 5·90 *lakhs*).—Ayacut to be benefited : 270 acres. Proposals were dropped.

7·173. *Reclamation of Pothayya kunta and Thangadacha lagoons on the right side of Kurnool-Cuddapah canal* (*Estimate Rs.* 11·01 *lakhs*).—Ayacut to be benefited : 1,440 acres. The reclamation of the two lagoons was ordered to lie over till the results of the reclamation of Revula cheruvu lagoon were observed.

7·174. *Restoration of Ankireddi cheruvu* (*Estimate Rs.* 1·24 *lakhs*).—Ayacut to be benefited : 320 acres. Proposals were under scrutiny by the Superintending Engineer.

7·175. *Nayanikunta cheruvu of Bollupalli, Cumbum taluk* (*Estimate Rs.* 3·20 *lakhs*).—Ayacut to be benefited : 300 acres. Proposals were recommended to Government to be dropped.

7·176. *Formation of a tank across Chinnakandaleru near Pullala cheruvu (Estimate Rs. 6·20 lakhs).*—Ayacut to be benefited : 645 acres. Alternative proposals were investigated and the reservoir scheme was recommended to Government for sanction.

7·177. *Constructing an anicut across Chinnakandaleru to augment supply to Krishna Reddy tank (Estimate Rs. 2·33 lakhs).*—Ayacut to be benefited : 200 acres. Proposals were under scrutiny by the Superintending Engineer.

7·178. *Gazuladinne Project (Estimate Rs. 17·91 lakhs).*—Ayacut to be benefited : 2,000 acres. The field work was completed by the Executive Engineer and proposals were being formulated.

7·179. *Construction of a reservoir across the Paleru between Rambhadrunipalle and Giddalore (Estimate Rs. 6 lakhs).*—Ayacut to be benefited : 750 acres. The scheme was under detailed investigation.

Madurai District.

7·180. *Parappalar Reservoir Scheme.*—The proposals were dropped.

7·181. *Sathiar Odai Reservoir Scheme (Estimate Rs. 22·33 lakhs).*—Ayacut to be benefited : 500 acres. The detailed investigation of the scheme was completed. Plans and estimate were scrutinized and returned to the Superintending Engineer with remarks.

7·182. *Irrigation-cum-Power development Scheme across Vaigai river (Vaigai Reservoir Scheme).*—Re-investigation of this reservoir scheme was taken up and proposals were awaited from the Superintending Engineer.

Tirunelveli District.

7·183. *Gheriyar Reservoir Project (Estimate Rs. 1·89 lakhs approximate).*—Ayacut to be benefited : 3,000 acres (new) and 6,000 acres (existing). The investigation of the scheme was completed. Plans and estimate were under scrutiny in Chief Engineer's (Irrigation) office.

7·184. *Servalar Reservoir Project (Estimate Rs. 4·43 lakhs).*—Ayacut to be benefited : 14,000 acres. The detailed investigation of the project was completed. Plans and estimate were awaited from the Superintending Engineer.

7·185 *Constructing an anicut across river Vaippar.*—The scheme was investigated and proposals were under consideration of Chief Engineer for Irrigation.

7·186. *Restoration of Vayali and Malayadipatti tank (Estimate Rs. 5,80,000).*—Ayacut to be benefited : 600 acres. Detailed estimates were under preparation.

7·187. *Formation of a new irrigation channel from Nagalkulam to Alangulam in Tenkasi taluk (Estimate Rs. 5·35 lakhs).*—Ayacut to be benefited : 660 acres. The Collector's views on the proposal were awaited.

Tiruchirappalli District.

7·188. *Pullambadi and Kattalai High Level Channel Schemes.*—The detailed investigation of the modified proposals for Pullambadi and Kattalai High Level Channel Schemes was in progress.

7·189. *Formation of a reservoir across Chinnar river below the infall of Koneri river (Estimate Rs. 28·65 lakhs).*—Ayacut to be benefited : 3,000 acres. The scheme was submitted to Government as Part II Scheme.

7·190. *Repairs and improvements to Sripurandan tank supply channel in Udayarpalayam taluk (Estimate Rs. 84,000).*—The scheme has not yet been sanctioned.

7·191. *Constructing an anicut across Ariyar river at the head of the supply channel to the Inam Kulathur tank (Estimate Rs. 1,10,000).*—Ayacut to be benefited : 204 acres (additional). The scheme has not yet been sanctioned.

7·192. *Construction of an anicut across Vellar river in the place of the ruined anicut near Sundarapatti village and excavation of supply channel (Estimate Rs. 3,17,000).*—Ayacut to be benefited : 1,613 acres. Plans and estimat owere under scrutiny in Chief Engineer for Irrigation's office.

7·193. *Construction of a masonry anicut across Vellar in Mirathuvili Vattam (Estimate Rs. 3,17,000).*—Ayacut to be benefited : 1,613 acres. Plans and estimate were under scrutiny in Chief Engineer for Irrigation's office.

7·194. *Construction of an anicut across Agniyar river near Pudupattai village (Estimate Rs. 2,30,000).*—Ayacut to be benefited : 950 acres. Plans and estimate were under scrutiny in Chief Engineer for Irrigation's office.

7·195. *Raising the F.T.L. of Kannagudi Periya Eri (Estimate Rs. 27,700).*—Ayacut to be benefited : 81 acres(additional). Plans and estimate were under scrutiny in Chief Engineer for Irrigation's office.

7·196. *Restoration of Kovakulam tank (Estimate Rs. 60,000).*—Ayacut to be benefited : 150 acres. Plans and estimate were under scrutiny in Chief Engineer for Irrigation's office.

Special Investigation Division.

7·197. *Localization of ayacut under Amaravati Reservoir Project.*—The work of localization of ayacut under this project was completed and report submitted to the Chief Engineer for Irrigation.

7·198. *Localization of Ayacut under Sathanur Reservoir Project.*—The work of localization of ayacut under this project was completed and report submitted to the Chief Engineer for Irrigation.

7·199. *Palar Reservoir Scheme near Kuppam (Estimate Rs. 262·46 lakhs).*—The balance of work on the scheme was completed. Plans and estimate were awaited from the Superintending Engineer.

7·200. *Grow More Food Schemes.*—Several major schemes taken up for execution last year were carried on to completion or were in advanced stage of execution during the year. Thirty-eight new schemes at an approximate cost of Rs. 55·03 lakhs to irrigate an approximate ayacut of about 28,484 acres (both new and existing) were sanctioned under intensive cultivation programme during the year. It is expected that an additional yield of 11,806 tons of foodgrains will be derived by completing the above schemes.

7·201. **Post-war Reconstruction Schemes.**—The schemes for improvement of drainage in Cauvery delta were completed. The scheme for improvements of drainage in Krishna delta was under progress. The total expenditure incurred on these schemes including Tungabhadra Project during the year and up to the end of the year are Rs. 7·82 crores and Rs. 22·68 crores respectively against an estimated cost of Rs. 44·24 crores.

7·202. **Kudimaramath works.**—About 160 channels at an estimated cost of Rs. 6,46,188 were taken up during the year 1951–52 and expenditure of was Rs. 2,68,458 was incurred.

7·203. **Contour bunding.**—Estimates for contour bunding works in three centres, viz., Hagari and Alur in Bellary district and Guntakal in Anantapur district were sanctioned in January 1949.

A brief note on the works done up to 30th June 1952 is furnished below :—

An area of 20,211 acres of land was surveyed and bund positions were aligned in 1,085 acres for actual execution of bunding. An extent of 4,370 acres of land was contour bunded and the areas of lands trenched was 78 acres. The waste weirs constructed numbered 78 and served an area of 569 acres. Sectioning of bunds was done for 2,000 acres and 6,000 acres were fixed with bench-marks. Lock spitting of the position of bunds was done for 4,370 acres.

Proposals for extending the scheme to 11,450 acres in all the three centres so as to complete an entire catchment in all the centres were submitted to Government.

A scheme for afforesting Kurnool-Cuddapah Canal banks had been investigated and is under preparation.

A scheme for soil conservation with contour bunding as its main feature drawn up for the season-affected areas of Chittoor district was sanctioned and the work has also been started.

7·204. **Tank Improvement Schemes.**—Two hundred and eighty-eight new schemes were sanctioned during the year at an estimated cost of Rs. 14,80,030 and a total expenditure of Rs. 13,03,669 was incurred on the new works and the continuation works.

7·205. **Irrigation Research Station, Poondi.**—During the period 1951–52, there was considerable progress in the work of the Research Station. Efficient and economical solutions were evolved for a number of complex problems pertaining to the projects under execution and investigation and to the maintenance works. New approaches were made in the design of structures, and basic research was carried out on a number of items.

7·206. Mention may, however, be made of the fact that owing to the successive failures of the monsoon, water-supply for the models became precarious towards the close of the calendar year 1951 with the result that number of items on which studies were commenced could not be finalised. However a circulating system of water-supply was constructed and after its installation, the studies were resumed without hindrance.

7·207. Sri J. I. Coilpillai B.E., A.M.I.E., (Ind.), Executive Engineer, P.W.D., continued to be in charge of the station during the period 1951–52; he left the station on transfer on 3rd April 1952 to Central Food Production Division, Madras. He was succeeded by Sri J. Visweswara Rao, B.E., M.SC., A.M.I. STRUCT. E. (Lond)., ASSOC. M.A.S.C.E., A.M.I.E., Assistant Research officer, who was promoted and appointed as Research Executive Engineer in charge of the station.

7·208. *Construction works.*—A comprehensive scheme of expansion of the residential colony was drawn up. During the year, additional quarters for two Junior Engineers and one block of upper division clerk's quarters were constructed.

7·209. For improving the drinking water-supply to the colony, Jewell Pressure Filters were ordered during the year 1951 and were installed.

7·210. *Medical Aid.*—The Government sanctioned a dispensary for Poondi in January 1952 and this dispensary came into operation.

7·211. *Hydraulic Model Experiments.*—A number of important problems pertaining to the projects, viz., Lower Bhavani, Kistna, Pennar and Malampuzha and schemes sanctioned under the Grow More Food Campaign were investigated. Studies relating to the problems of maintenance of existing structures and investigations of fundamental nature, which would be of value for general application in the design of new structures were also carried out A description is given below of the more important studies conducted.

7·212. (1) Projects, (2) Maintenance of existing works and (3) Basic Research Photograph No. 1 shows a view of the main laboratory building.

7·213. *Projects.*—(1) In the Lower Bhavani Project Canal System in certain reaches where the ground fall is too steep necessitating the adoption of a number of drops in a short reach, with a view to effect saving in cost under instructions of the Chief Engineer for Irrigation, designs were evolved for lined canal chutes in lieu of drops. For example, economy of about 40 per cent in cost resulted thereby in one instance. Apart from saving in cost it may be mentioned that the introduction of chutes in lieu of drops, forms an important engineering future for the Madras State. Photograph No. 2 shows the alignment of the lined canal chute which permits of the development of a high velocity and hence is built of a narrow section.

7·214. Stream-lined inlet curves were designed for the off-take of Unjalur distributary of the Lower Bhavani Project main canal.

7·215. Type designs (i) for pipe drops of 6 cusecs and less and (ii) for pipe sluices at the off-takes of small distributaries were tested and finalized.

7·216. In the case of Kistna-Pennar Project, the design for the fluming of Kistna-Pennar main canal through the Mittakondala ridge separating the Kistna and Pennar valleys was tested by model experiments for examining the feasibility of the proposal. Further studies were in progress. Photograph No. 3 shows the head-sluice and the initial reach of the flumed portion below, with its tortuous alignment which was preferred from consideration of economy in cutting of the ridge. Photograph No. 4 shows the stilling arrangements in rear of the head sluice as finalized by experiments on a part-model constructed in teakwood inside a glass-walled flume.

7·217. Experiments were conducted and results obtained for the Pennar Kumudavati Project on the following aspects:—(i) the effect of modifying the crest shape providing a level footpath 2 feet on the top, on the value of the co-efficient of discharge, (ii) the optimum position for the rectangular baffle blocks in the stilling basin in rear of the high-co-efficient weir, (iii) energy dissipation arrangements for the undersluices and (iv) design of the divide walls for effective silt exclusion from the right flank and left flank canals. Photograph No. 5 illustrates how the divide wall of suitable curvature evolved by the experiments, successfully diverts all the bed flow carrying the silt towards the anicut and keeps the approach channel to the head-sluice silt-free

7·218. *Maintenance works.*—The Chief Engineer for Irrigation as a part of the programme of the studies in the Research Station wanted that model experiments should be conducted to evolve a rational procedure for computing the discharge in the case of ten major anicuts in the Madras State, since the results of model studies on the Kistna Anicut published in the Annual Report of the Station for 1949, revealed that the computation procedure in adoption did not always furnish an accurate estimate of the discharge. In this connexion necessary results were obtained by model experiments in the case of (i) Dowlaishwaram anicut across the Godavari, (ii) Nellore anicut across the Pennar and (iii) Sangam anicut across the Pennar.

7·219. In the case of the left flank canal taking off from the anicut across Nagalar Odai in the Madurai district and the Sanagapadu channel taking off under an open head from the Muniyeru river in Krishna district, designs were evolved for ensuring supplies to the canals without danger of the approach channel getting silted up.

7·220. *Basic Research.*—Investigation of a fundamental nature were conducted and results of general application in future design were collected for—

(i) design of exit transition in cross-drainage works;
(ii) infiltration galleries for water-supply schemes; and
(iii) seepage reduction in earth dams by partial shoot pile cut-off and blankets.

7·221. With regard to the design of exit transition, photograph No. 6 illustrates the whirlpool action obtaining in an ill-designed exit transition, giving rise to loss of head in the structure, and scouring action on the bed and sides of the channel below. Photograph No. 7 illustrates how two short vanes interposed in water at the commencement of the exit transition restores uniform and quiescent conditions of flow.

7·222. *Value of results achieved.*—The model experiments proved useful by (i) ensuring safety of the structures design, (ii) improving practically in all the cases the efficiency of performance and (iii) effecting economies in the cost or prototype structures. Apart from direct economies in specific cases, the knowledge gained by experiments is also being employed in the design of new structures and the savings in cost thereby effected being of an indirect nature cannot be evaluated. A Similiar benefit of model experiments which cannot be directly assessed is the saving in the periodical maintenance cost of structures.

7·223. *Programme of work for* 1952–53.—A list of important problems on which investigations were programmed as per the instruction of Chief Engineer for Irrigation is below:—

(i) Krishna-Pennar Project—Further studies on the fluming through Mittakondala ridge cutting.

(ii) Retrogression below the Pennar dam and upstream of the pick up barrage.

(iii) Type designs for canal drops of discharges from 6 cusecs to 20 cusecs and above 20 cusecs.

(iv) Energy dissipation below spillway dams by splitter blocks at the toe.

(v) Design of exit transitions in canals—Further studies.

(vi) Design of infiltration galleries—Further studies.

(vii) Siphon spillways—Permissible negative pressures and vibrations.

(viii) Design of stream-lined sills for increasing the discharge through head-sluices in several head-works.

(ix) Studies on light-weight materials for building construction and experiments on the evolution of cheap type of housing, etc.

7·224. *Visitors.*—The Research Station attracted a number of distinguished visitors, such as Statesmen, Professors, Research Directors, etc. Several batches of students from the Engineering Colleges and Technological Institutions in the State visited the Station as a part of their study tours.

Soil Engineering Research Station.

7·225. The Soil Engineering Rerearch Station, Chepauk, Madras, recorded further progress in its activities during the period under review.

7·226. Among the important equipments added during this year may be mentioned (1) a Ferguson Compressor and (2) a Mettler self-registering analytical balance.

7·227. Testing at the rate of six samples each day with all the significant tests, as routine practice, was being done. Triaxial shear tests and consolidation tests were conducted in particular cases where these additional test results would prove specially significant.

7·228. During the period under review, more than 1,800 soil samples were tested excluding water samples and other miscellaneous samples. Soil surveys and investigations were conducted for a number of major projects and Grow More Food schemes as noted below.

7·229. *Krishna-Pennar Project.*—The work in connexion with this project consisted mainly of testing samples obtained from a large number of bore-holes put (1) in the bed of the Pennar river at the gorge section, both in front and to the rear of the dam alignment and (2) in the sites of cuttings through which the project canals have to be taken. Tests were conducted also for samples from bore-holes put in the site of the New Gandikota dam.

7·230. *Tungabhadra Project.*—Samples were tested and reported on in connexion with the formation of the Narihalle embankment on the low-level canal alignment.

7·231. *Lower Bhavani Project.*—Triaxial shear tests were conducted for certain soil samples. The results of triaxial shear tests were compared with those of direct shear tests and found to tally within the limits of experimental and sampling errors.

7·232. *Maimuthar Project.*—A detailed preliminary soil survey was conducted in respect of this project, by putting in a large number of trial pits at one furlong centres in the pattern of square grids, on both sides of the river and within the waterspread.

7·233. *Malampuzha Project.*—The soil characteristics within the core trench in the section of the earth dam of the project was investigated with a view to limit

the depth of trench in this reach. In addition, soil samples used for construction were tested daily and reported on immediately and in time so as not to delay construction.

7·234. *Rallapad Project.*—The soil conditions along the new alignment of the Reddikalva canal of this project was investigated and found satisfactory. A complete soil survey was carried out in the dam-site area of the Rallapad Reservoir and soil survey map of the area giving all the required details was prepared.

7·235. *Tigaleru and Panyam Reservoirs.*—Based on the method of controlling embankment compaction developed in this Research Station, daily field-test results were received from the Tigaleru and Panyam Reservoir schemes. The results were critically examined, tabulated and entered in large-scale drawings and periodically reported on.

7·236. *Other schemes.*—Soil surveys were conducted in respect of Kalyani Reservoir Scheme, Lower Sagileru Project, Kanchalamma Tank Scheme and large number of similar reservoir and tank restoration schemes.

7·237. Foundation studies were undertaken for the following among others :—

(1) New hostel for Legislators, (2) Maternity hospital at Rayapuram, (3) Nurses' quarters for the Kasturba Gandhi Hospital, Triplicane, (4) construction of rice godown at Gopalapuram, and (5) office block for Government Victoria College, Palghat, etc.

7·238. Soil samples at different depths below foundation level were taken and examined in the laboratory. The bearing strength and shrinkage characteristics of the different strata underneath were studied and reported on from the point of view of their probable effects on the foundations stability of the structures proposed to be raised.

7·239. Weekly samples of water from the Mettur Reservoir collected from various places in the reservoir were received and they were tested for total, dissolved and suspended solids. Water samples were received from the Krishna Western and Godavari Western divisions and they were analysed for sediment loads. Weighted mean diameters and silt factors were determined for bed silt samples from Krishna Eastern and Western main canals and silt for sediment loads in the main canal of the Godavari Central delta. In connexion with the Krishna-Pennar Project, water samples were collected at the Someswaram and Siddeswaram dam sites during floods and tested.

7·240. The laboratory studies on the effects of micromesh prefiltration were continued. A pilot plant was under construction for erection at Kilpauk experimental filter station.

7·241. The geophysical survey equipment was set up to study the sub-soil conditions at four different sites near the laboratory, the electrical resistivity method was used, to start with.

7·242. Fundamental research studies were initiated to determine the swelling pressures exerted by clays when they were allowed to saturate under confined conditions. Another series of experiments were begun to determine the correlation between compaction and other significant soil properties like shear strength, permeability, etc.

7·243. Experiments using plaster of paris cubes to regulate the amount and frequency of application of irrigation water to fields for irrigated dry crops was continued at the Irrigation Experimental Station, Mewani, in the Lower Bhavani area.

7·244. The plaster of paris model had been further extended. A model of the Bhairavanitippa Project was made and exhibited during the inauguration ceremony of the project.

7·245. Tests on lignite samples and soil samples were carried out in the laboratory in connexion with the lignite investigations, Neyveli.

7·246. In the Chemistry section of the laboratory, in addition to tests on cements, surkies, limes, etc., proximate analysis for lignite samples were conducted and wax was extracted from the lignite specimens.

7·247. The photo-elasticity apparatus was used to study the stress distribution around the drainage gallery of the Lower Bhavani dam, between dry wells in the sluice sections. Necessity for providing additional reinforcements or a special beam was investigated. At first three preliminary models were made. Loads were applied to the model to represent water pressure from the front, and photo-elastic stress patterns were obtained for different loadings. A second set of five models were then made. Loads were applied to these models in two perpendicular directions to correspond to both weight of masonry above and water pressure in front. Series of photographs of stress patterns for different loads in both directions were taken. Even though the above was only a qualitative study, it nevertheless enabled the Chief Engineer to pass orders that a relieving beam may be provided in front of the gallery and that for additional safety, the gallery may be reinforced, as if there is no relieving beam.

7·248. The portion between gallery face and the beam more over is to be made of rich mix of cement concrete and lightly reinforced, if necessary, as a plain column.

Concrete Laboratory and Designs Office,

Designs Branch.

7·249. *Krishna Pennar Project.*—The preliminary designs and drawings were revised with reference to Dr. Savage's remarks. Typical working tables were also prepared. The project proposals underwent a revision, consequent on the allocation of waters by the Planning Commission and with reference to these, revised preliminary drawings, estimates and working tables were made out. Working tables for Krishna and Pennar reservoirs for stage development and full plan for the years 1929–30, 1930–31, 1931–32 and 1932–33 were completed. Data required by the Planning Commission Technical Committee were prepared and submitted.

7·250. The balance of drawings to complete the specification drawings, specifications and designs, reports, etc., were under preparation.

7·251. *Upper Pennar Project.*—The designs, drawings and estimates for Pennar dam were completed.

7·252. *Gandhikota Project.*—Preliminary designs, drawings and estimates for Gandhikota dam were prepared.

7·253. *Mettur Canals Project.*—Drawings relating to the presssure aqueduct for the Cauvery river crossing as per the revised design adopting steel pipes over the river portion and reinforced concrete boxes at the approaches were completed. Specifications for the work and technical reports with the design calculations were also prepared.

7·254. Designs for the Chittar river crossing of the right bank canal as also the off-takes from high-level sluices of Mettur Dam were completed.

7·255. *Lower Bhavani Project.*—Preparation of the designs report was in progress.

7·256. *Tungabhadra Project.*—Detailed structural calculations for trash rack structures were worked out and furnished.

7·257. *Malampuzha Project.*—Revised drawings for sluices in dam providing for fixed wheel gate instead of slide gates were prepared. Detailed calculations were worked out and furnished for reinforcement around sluice and penstock and gallery openings.

7·258. Designs and drawings for the main canal crossing of Erumaiyur thodu were completed.

7·259. *Ramapadasagar Project.*—Comparative costs for proposals of an earth dam for the Ramapadasagar Project at a new site for F.R.L. of 170·00 and 160·00 were worked out.

7·260. *Rallapad Project.*—River diversion proposals for Rallapad dam were studied.

7·261. *Manimuthar Project.*—Preparation of designs and drawings was in progress.

Surveys and studies of Mopad Reservoir silting were in progress.

7·262. *Further work.*—Besides completing balance of work on the above items, designs for Mangalam Reservoir Scheme, Walayar Reservoir Scheme, Bhairavanitippa and Hagari Bommanahalli Projects have to be taken up.

7·263. *Test branch—Concrete Research Laboratory.*—The Concrete Research Laboratory offered facilities during the year for carrying out routine tests as well as special investigation on building materials in general and concrete in particular for various divisions and projects of the P.W.D., Highways, Public Health, Electricity, Cochin Harbour, Madras Port Trust, Madras Corporation, Bhakra Dam, Concrete Association of India and other departments and private agencies.

7·264. Among the works of special nature mention may be made of the work of selection of an Indian Standard sand in place of British Standard sand for cement tests. Samples all over India were being tested. This work was for the Indian Standard Institution.

7·265. Besides routine tests on cement aggregates, concrete, steel rods, etc., the laboratory was engaged in research work. The following are the main topics of research:

(1) Studies of properties of surki.
(2) Water-proofing of concrete with composal.
(3) Expansion of masonry.
(4) Bulk density of aggregate.
(5) Light weight concrete.
(6) Bamboo as reinforcement for concrete.
(7) Use of sea sand in concrete.
(8) Nofines concrete.

Many Engineers and Engineering students, both from this State and outside, visited the laboratory during the year.

7·266. *Building research unit.*—Building research unit as an adjunct to the Concrete Laboratory is concerned mainly with soil mechanics problems and in particular, foundation problems. Of the work done during the year mention may be made of the following:—

(1) Analysis of soils and foundation designs for Uppatheru and Bharathapuzha bridges, Madras School of Indian Medicine, Rajahmundry Art College, Eluru Hospital, Madura Hospital Buildings, etc.

(2) Analysis and design of embankment for Nandyal water-supply, Kanchalamma tank, etc.

(3) Studies on compaction of soils and behaviour of black-cotton soils.
(4) Studies on stresses in soils.

7·267. *Programme of work for* 1952–53—*List of topics*—

(1) Studies on surki, bricks, lime, etc., to standardise these materials.
(2) Bamboo reinforced concrete.
(3) Shock concrete.
(4) Light weight concrete.
(5) Nofine concrete.
(6) Prestressed concrete and masonry.
(7) Bulk density of aggregates.
(8) Studies on black-cotton soil.
(9) Compaction, shear and consolidation of soils.
(10) Soil stabilization.

(11) Embankment design.
(12) Building and bridge foundation problems.

7·268. Work in the Central Designs Office and in the laboratories was carried under the direction of Sri A. R. Venkatachari, B.E., M.I.E. (Ind.), M. A.S. SOC. C.E., I.S.E., Sri M. S. Thirumale Iyengar, B.E., M.I.E. (Ind.), I.S.E., and Sri T. S. Venkataraman, B.E., I.S E., Chief Engineers. The immediate supervision was held as under—

Mr. J. M. Frederick, B.A., B.E., I.S.E., Designs Engineer.

Sri S. Raghavachari, B.E., Executive Engineer.

GAUGING DIVISION.

7·269. *Gauging division.*—This division formed on 13th December 1948 under G.O. No. 1104, P.W., dated 1st April 1948, is being continued this year also with the same staff—vide G.O. No. 4952, P.W., dated 4th December 1951. The subdivisions attached to this division are (i) Gauging Subdivision, Madras, (ii) Cauvery Gauging Subdivision, Mysore, and (iii) Stock Verification Subdivision, Madras.

7·270. *Work done during* 1951–52—(i) *Gauging Subdivision, Madras.*—Monographs of Tambaraparni and Palar rivers were completed. The monographs for Pennar at Sangam and Nellore anicuts were under progress.

7·271. A brochure on the Grand Anicut across the Cauvery dealing with its origin and its importance to Tiruchirappalli and Tanjore deltas was revised and reedited based on additional information furnished by the Executive Engineer, Cauvery Division.

7·272. All the references received in connexion with Inter-State affairs, Mysore-Madras agreements, Central Board of Irrigation and Navigation Commission and the information required by the Central Water and Power Commission in the draft questionnaire were being attended to.

7·273. The Water Year Book for Krishna river for the years 1894–1945, based on the Poondi Research Station experiments, was completed.

7·274. Detailed discharge statements at Nellore anicut on Pennar river based on experiments at Poondi were being worked out.

7·275. The office copy of the Water Year Book for Vellar and Vaigai rivers in the revised form was completed and the volumes to be submitted to the Chief Engineer for Irrigation for approval are under preparation.

7·276. Water Year Books for Palar at Palar anicut and South Pennar at Tirukkoilur anicut were under progress. Collection and supply of daily discharge figures at the anicut across Godavari at Dowlaishwaram anicut, across Krishna at Vijayavada, Adinimayapalli and Sangam anicuts, across Ponnar and other particulars connected with the Krishna, Pennar, etc., projects as required by the Planning Commission Technical Committee for Madras Projects were furnished.

7·277. *Cauvery Gauging subdivision, Mysore.*—Joint gaugings across the Hemavathi at Akkihebbal among the three standard stations in Mysore, viz., Undivadi, Chinchinkatte and Akkihebbal and across the Mandagere right bank channel of the Hemavathi and Visveswarayya canal at Krishnarajasagara were conducted during this year. Joint gaugings of Akkihebbal were, however, stopped a little before usual time due to low flows and all stages having been covered already. Joint gauging of Sivasamudram and Shimsha Power Channels were also conducted in March 1952.

7·278. All the results of current meter gaugings, 1950–51; taken across the Cauvery at Nattarmangalam, and in the various delta gauging stations were scrutinized and reports submitted to the Chief Engineer for Irrigation.

7·279. About 45 current meters were received and re-rated mainly at Guindy Rating Station and few at Krishnarajasagara and returned to the respective gauging stations in the State.

7·280. Suitable sites for gaugings were also selected by the Executive Engineer, Gaugings, after inspecting the various anicuts across the Thambaraparani and Periyar rivers. The Executive Engineers of the respective divisions were requested to prepare plans and estimates and put them up for the sanction of their Superintending Engineer.

7·281. The Krishnarajasagara regulation statements received from the Controlling Officer, Krishnarajasagara, for the period ending 29th September 1951, 8 p.m., were scrutinized.

7·282. (iii) *Stock verification subdivision.*—Irrigation stores, as they are now available, consist of two sections (i) machinery, etc., stocked in stores as brought out by the ledgers and (ii) machinery, etc., directly purchased for the various projects and kept under numerical stores account. The verification of the two sections was sanctioned by the Chief Engineer (General) in Memo. No. 1000, AC/52-C.P., dated 28th February 1952. Machinery such as mixers, scrapers, tractors, lorries, pumpsets and electrical drilling sets, etc., and their spares as listed out in 1053 folios of the ledgers and valued at about 17 lakhs were verified under the first section; 48 items of machinery and spares valued at about Rs. 5 lakhs were verified under the second section and it was reported that there were no discrepancies in any of the items including their components in both the sections.

7·283. Subsequently the Subdivisional Officer with his assistants started verification of the Mettur stocks at Madras. This consist of new and second-hand machinery and spares, etc., which became surplus after the completion of Cauvery-Mettur Project, and which were kept at Madras for final disposal. Most of the Mettur stocks at Madras had been auctioned since the last verification. A portion of about 203 items which were left over without being auctioned were verified by the Stock Verification Branch. There were no discrepancies in any of the items verified.

7·284. **New Irrigation era.**—This journal started before two years by the Irrigation Branch of the P.W.D. and intended to keep our far-flung technical staff well informed about the latest developments in Engineering is developing into an institution by itself. Several articles relating to projects in and outside India and about many striking achievements in the Science of Engineering anywhere in the world are being published in this. Volume I is completed with four issues. The second volume is now under publication and is expected to contain six issues. Three issues have already been published and the fourth is under print.

FLOODS, BREACHES AND ACCIDENTS.

7·285. *Dowlaishwaram Circle.*—There were no heavy floods or cyclone during the year.

7·286. *Vijayavada Circle.*—There were no heavy floods and flood damages worth mentioning during the year except that floods occurred in East and West Tammileru drains which caused breaches on Tammileru and Masurikacodu drains.

7·287. *Anantapur Circle.*—There were no heavy floods and no damages caused thereby.

7·288. There was fatal accident during the year in Pennar-Kumuthavathi Project. One Muniappa employed as earth work labourer by anicut contractor met with instantaneous death struck by lightning.

7·289. *Madras Circle.*—There were no heavy floods during the year. A small breach of 30 feet occurred in P.V. Kolathur channel in Chingleput district and it was closed at a cost of Rs. 600.

7·290. *Tiruchirappalli Circle.*—There were no exceptional floods during the year. But due to heavy rains in September and November 1951 some slight damages were caused here and there in Tiruchirappalli and Tirunelveli divisions. A fatal accident to a mazdoor while travelling home in departmental lorry at Manimuthar Project had occurred during the year.

APPENDIX.

LIST OF SCHEMES SANCTIONED UNDER "GROW MORE FOOD" CAMPAIGN DURING THE YEAR 1951–52.

Serial number and name of the schemes.	Cost (including direct and indirect charges).	Approximate ayacut.	Yield.
(1)	(2)	(3)	(4)
	RS.		
West Godavari District.			
1 Providing relief from submersion to certain lands on the right side of the Agalalanka channel.	1,50,300	1,360 (new) 1,460 acres to be sanctioned from submersion.	1,385
2 Excavation of a straight cut from the tail-end of Polimaritippa drain into Upputeru.	61,465	1,000	500
East Godavari District.			
1 Coringa Island Project	18,61,000	6,600	3,3000
Visakhapatnam District.			
1 Formation of a reservoir across Upper Varaha River in Ravanapalli village.	5,43,426	100 (new) 1,666 (existing)	349
Srikakulam District.			
1 Carrying out improvements to the *anicuts across the Wommigedda (Rallagedda North) and the channel taking off from it and the excavation of a branch channel to provide irrigation* facilities to dry lands in Dangubhadra village.	1,10,500	160 (new) 365 (existing)	124
Guntur District.			
1 Remodelling Komali channel and its branches ..	30,941	172 (new)	129
2 Provision of irrigation facilities to an extent of 640 acres lying in Guntacole Block in Krishna Western Delta.	29,570	397 (new) 243 (existing)	211
3 Improving supply to the Thondapi village tank by constructing an anicut across Chagalla vagu and diversion of water in the existing channel.	1,17,050	300	120
4 Provision of irrigation facilities to dry block of lands in *Edupalli* and other villages.	1,00,844	814·29 (new) 149·51 (existing)	412
Krishna District.			
1 Provision of irrigation facilities by pumping to lands in Patamata and Gundala villages.	1,47,524	500	250
2 Excavation of a new channel from Kaikalur channel to provide irrigation facilities to Pallivada, Kottada, etc., villages.	1,56,000	I,462	731
3 Provision of better irrigation facilities to *Kothapalli* village by excavating a branch channel.	28,900	600 (existing)	150
Kurnool District.			
1 *Excavation of Harivaram channel* to provide irrigation facilities to lands in Harivaram, etc., villages.	86,453	881	440½
2 Restoration of Ramathirtham tank across Buggavagu.	81,200	230 (new) 45 (existing)	115
Nellore District.			
1 Improvements to North Amalur tank	74,012	208	104
2 Improving supply to ayacut under Zaladanki tank and construction of an anicut across Chippalem.	61,100	179 (new) 1,200 (existing)	90
Chingleput District.			
1 Improvements to and restoration of Reddi Thangal tank.	41,372	50	25
2 Construction of a small masonry dam across the Maduvu in Varadarajapuram village.	45,500	370 (second crop)	62
3 Construction of a masonry dam in the place of a mud dam across the Maduvu below Arungudram and Mull villages.	18,750	50	75

Serial number and name of the scheme.	Cost (including direct and indirect charges).	Approximate ayacut.	Yield.
(1)	(2)	(3)	(4)
	RS.	ACS.	TONS.
Tanjore District.			
Provision of irrigation facilities by pumping to Deepambalpatnam and Segal villages.	31,950	270 (new) 50 (existing)	135
Supplementing supply from Uyyakondan channel to Sayakudi and four other rainfed tanks.	52,912	500	250
Providing irrigation facilities to Thanikottayam, Vaduvancheri and three other villages by extending irrigation at the tail end of Mulliar II Stage.	1,99,947	1,500	525
South Arcot District.			
Construction of a dam across Kaludur Odai ..	1,27,505	300	134½
Excavation of a new channel above Korrakuvadi anicut across Vellar.	35,101	150	75
Extension of irrigation on the left side of Vadavar in * Kattagaram, etc., villages.	1,77,667	933·28	323
Supply of water from Bhuvanagiri voikal to lands north of Vellar C. Muthur village.	24,720	240	12
Constructing a new sluice in the foreshore bund of Veeranam tank in Kottandaralagam village to provide irrigation facilities to 330 acres.	21,580	330	165
Tiruchirappalli District.			
Provision of water-supply to new Vilankulam tank from Uyyakondan channel.	15,950	200	100
Improvements to the Kolakarankoil Kattuvari in Marudur village limit for efficient drainage of wet fields.	29,421	750 to be relieved from submersion.	139
Construction of an anicut across Uppar and excavation of right side channel.	65,000	263·06	128
Madurai District.			
Restoration of Anaikulam anicut	21,451	91	72
Coimbatore District.			
Arakankottai channel extension scheme	8,05,880	1,800	900
South Kanara District.			
Formation of a new tank at Govindur hamlet ..	53,952	41	21
Improvements to Mogibettu Madugu	26,000	80	40
Construction of a salt water exclusion dam at Maravanthe village.	19,760	51·79 (existing)	10
Malabar District.			
Construction of a dam across the Manalathazham canal.	23,700	42	21
Construction of a vented dam across the Thodu in R.S. No. 84 of Engandiyur village.	13,650	100 (existing)	12
Constructing a vented dam across Thodu in R.S. No. 282 of Edakazhiyur village.	10,500	220	62

* Tiruchirappalli district also.

IRRIGATION RESEARCH STATION, POONDI.

IMPRESSIONS OF DISTINGUISHED VISITORS.

(1)

I was very glad to see the work of this Research station. The experiments that are being made are very interesting and I have no doubt the results are valuable. I hope it will develop into a much bigger research centre which will help not only the Madras State but will also be able to guide other part of India.

(Sd.) K. SANTHANAM,
Honourable Minister, Central Government.

(2)

I paid another visit to this place to-day and was very pleased to find everything going on splendidly. The Irrigation Research Station is doing excellent work and the results obtained are, I am sure, very gratifying.

(Sd.) K. RAMUNNI MENON,
Chief Secretary to Government.

(3)

I consider myself very fortunate to have the opportunity of being shown the important work that is being done in these laboratories. The future welfare of this part of India purely lies very much in the continuous development of its water-supplies.

(Sd.) R. GILINE BUCHANAN,
London School of Economics, London.

(4)

It was with great interest that I saw and had explained to me the many hydraulic models at this research station, I was naturally more than interested in the Cooum model and the attempt that is being made to maintain a communication between the Cooum and the sea. I wish the Executive Engineer and his staff every success in their earnest endeavours at this station.

(Sd.) G. P. ALEXANDER,
Chairman, Madras Port Trust

(5)

I had visited the research station a few years back when it was still in its preliminary stages. Since then enormous work has been done and very many useful experiments have been carried out under the able guidance of Mr. Coilpillai and Mr. J. V. Rao, specially the work that has been done on "Fluming on Canals" is of great interest and will be of immense use of all hydraulic engineers. I congratulate the Executive Engineer and his band of able assistants on the good work they are doing.

(Sd.) N. S. GOVINDA RAO,
Professor, Indian Institute of Science.

(6)

Mr. Coilpillai (Executive Engineer) took me round the station and explained the various works. I was very much impressed with what I saw especially the help rendered to the various Irrigation works undertaken by the State and ultimate benefit to the Food Production schemes.

(Sd.) J. L. P. ROCHE VICTORIA,
Minister for Food and Fisheries, Madras.

(7)

I visited the Research Station this morning along with my friends. Sri Rao took us round and explained to us the various experiments carried on. We were very much impressed with what we saw and realized how valuable the work done here is. We are deeply grateful to Sri Rao, for the trouble he has taken though to-day is a holiday.

(Sd.) V. HANUMANTHA RAO,
Joint Secretary to Government.

(8)

My wife and I with Professor Kuriyan visited this Research Station to-day. The work is impressive and well in accord with what we have seen of such stations in both England and U.S.A. It is evidence of the ability and energy of its engineers and of fine research and as an investment much of enormous value to the world.

(Sd.) C. B. FAWCETT, SC.D.
Emertitus Professor, University of London and at present visiting Professor, University of Ceylon.

(9)

I was greatly interested to visit this spot and to see how the spirit of research permeates the workers to evolve new ways of improving irrigation and increasing the prosperity of the country.

(Sd.) N. K. SIDHANTA,
Member, U.P.S.C., New Delhi.

SOIL ENGINEERING RESEARCH STATION, CHEPAUK, MADRAS.

IMPRESSIONS OF DISTINGUISHED VISITORS.

(1)

The officers showed me round the laboratories and I have been specially impressed by the local manufacture of several apparatus which normally costs lot of money to be imported from abroad. Very good work is being done.

(Sd.) V. A. ALAGARATNAM,
Irrigation Department, Ceylon.

4th May 1951.

(2)

The organization of the laboratory is really excellent and I am very obliged to Mr. T. N. Seshadri for showing me around.

(Sd.) K. VOGL,
14*th September* 1951. *Research Officer, Central Standards Office of Railways, New Delhi.*

(3)

I have been round the Soil Mechanics Laboratory and am very agreeably surprised to see that all the apparatus are locally made. I have seen most of the other soil laboratories in this country and this is the only one which has produced all the apparatus locally. I am grateful to Shri Seshadri for giving me all the details.

(Sd.) S. N. TRIPATHI,
19*th November* 1951. *Executive Engineer, Madya Pradesh, Nagpur.*

(4)

One's education is never complete. Seeing the work which is being done in concrete research and soil research has been one landmark in my education. The future of the country depends on the extension of research laboratories and consequent development of engineering. Madras gives us the lead.

(Sd.) N. K. SIDHANTA,
(Sd). N. GOVINDARAJAN,
18*th January* 1952. *Members, Union Public Service Commission, New Delhi.*

(5)

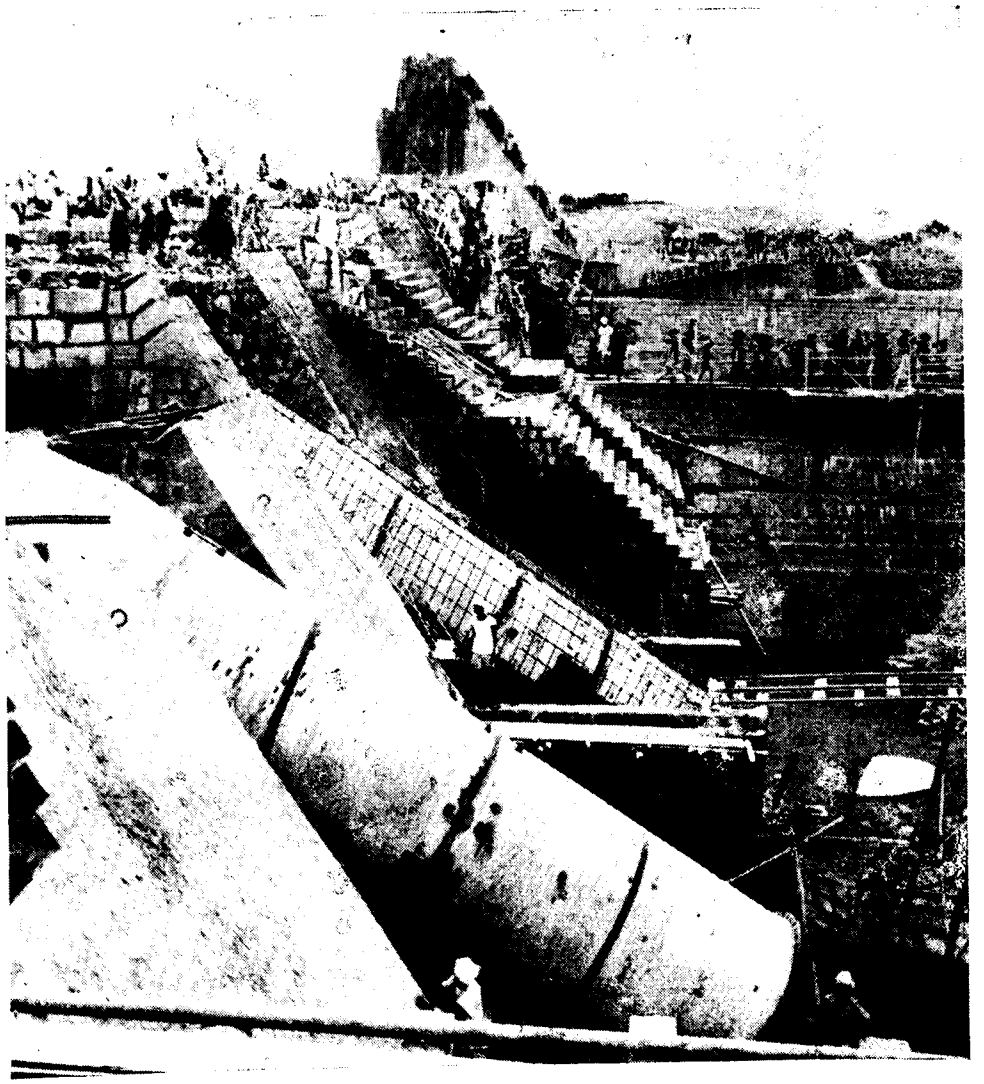
I was very pleased to be shown round the soil physics laboratory to-day by Mr. Seshadri. It shows in a very clear manner the extent of useful activities possible when physics gets applied to examine the details of many an Engineering requirements of the country. I wish this organization every expansion and growth in the years to come.

(Sd.) H. PARAMESWARAN,
31*st January* 1952. *Director of Industries, Travancore State.*

(6)

It has been a great pleasure to visit this Laboratory and see the useful work of Mr. Seshadri and his colleagues. Knowing the need of soil research for the country I wish them every success.

(Sd.) S. P. RAJU,
27*th March* 1952. *Director of Engineering Research, Government of Hyderabad.*



LOWER BHAVANI PROJECT

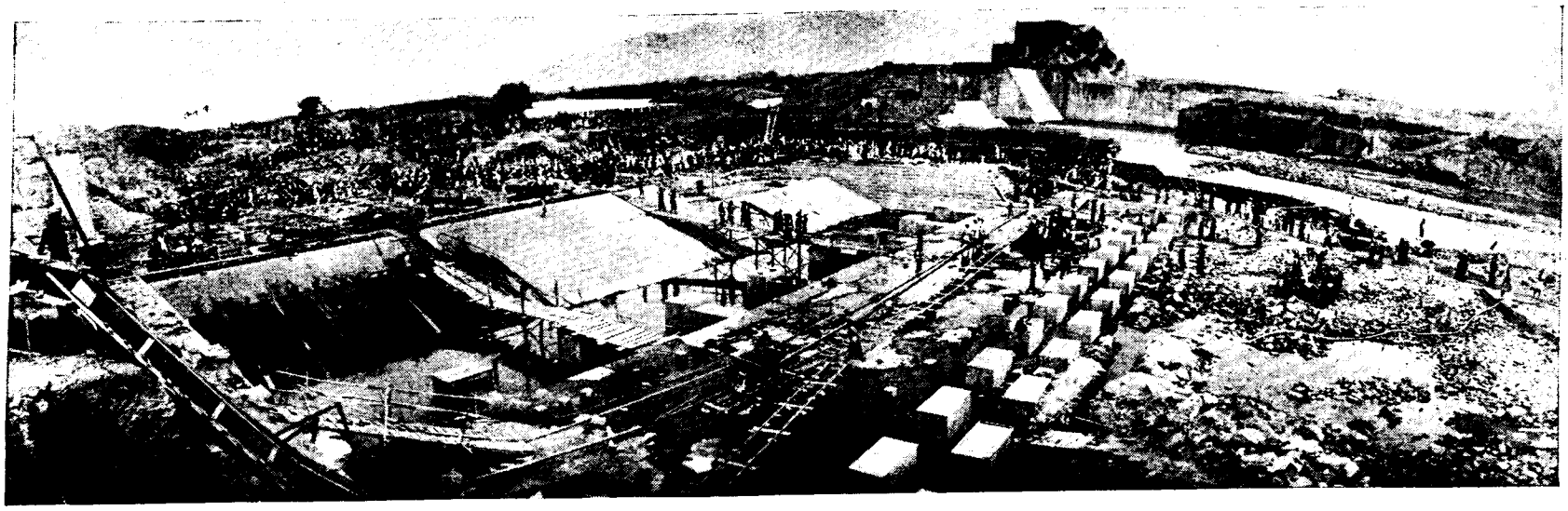
JANUARY 1952—PENSTOCK PIPES ERECTED IN POSITION AND BEING CONCRETED—2 PIPES HAVE BEEN CONCRETED AND THE OTHER TWO ARE ABOUT TO BE CONCRETED.

LOWER BHAVANI PROJECT

24TH JULY 1951—A FLOOD OF NEARLY 6,000 CUSECS IS BEING DISCHARGED THROUGH THE CENTRAL PORTION OF THE MASONRY DAM WHICH WAS KEPT PARTICULARLY LOW FOR THE PURPOSE.

LOWER BHAVANI PROJECT

DECEMBER 1951—FORM WORK IN BRICK TO GET ELLIPTICAL STREAM LINE ENTRANCE TO THE SLUICES.

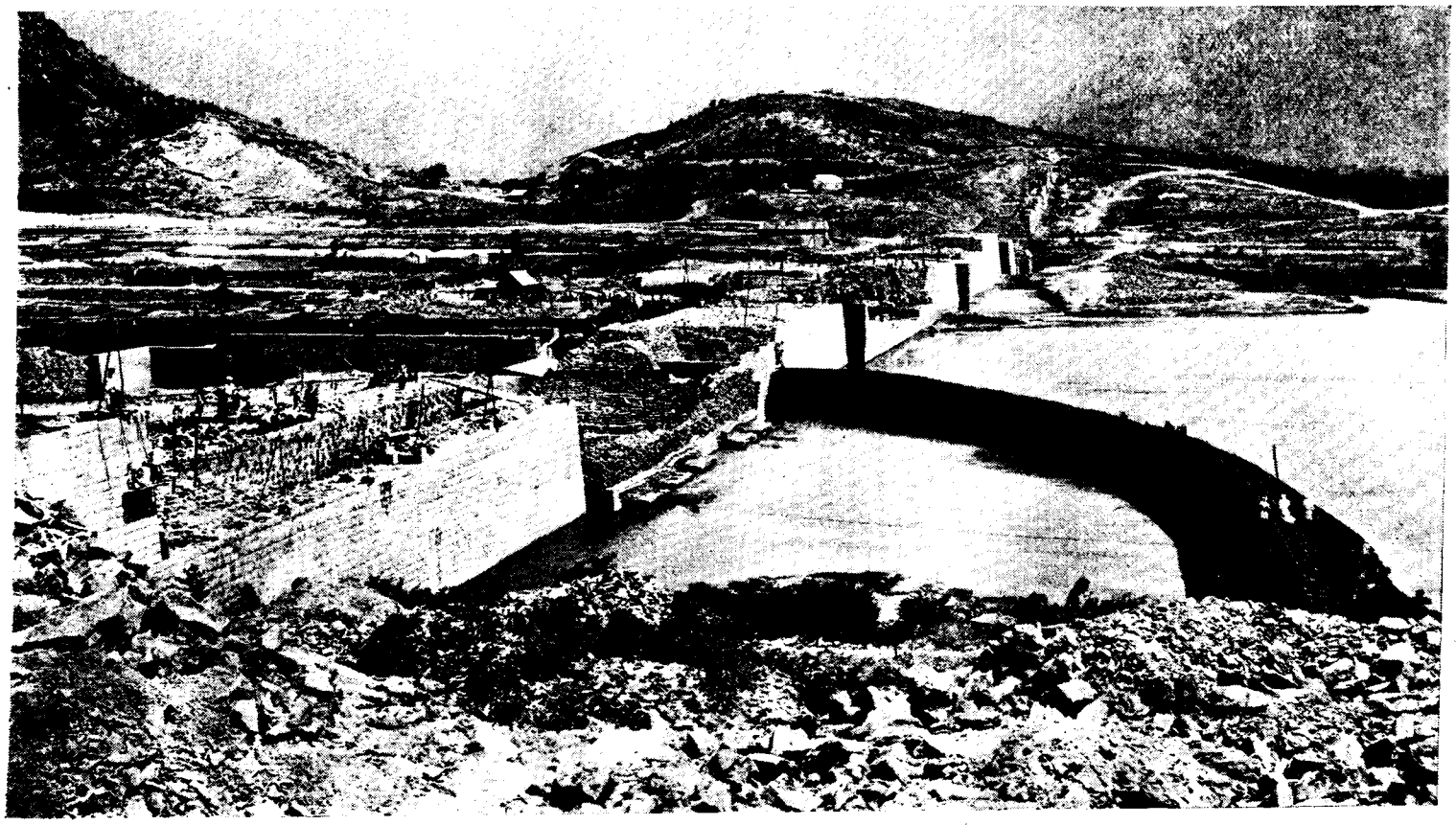


LOWER BHAVANI PROJECT

25TH MAY 1951—REAR VIEW OF MASONRY IN THE RIVER SLUICE PORTION. THE PICTURE SHOWS THE STAGGER BLOCKS, REAR BUCKET AND T. BAFFLE BLOCKS.

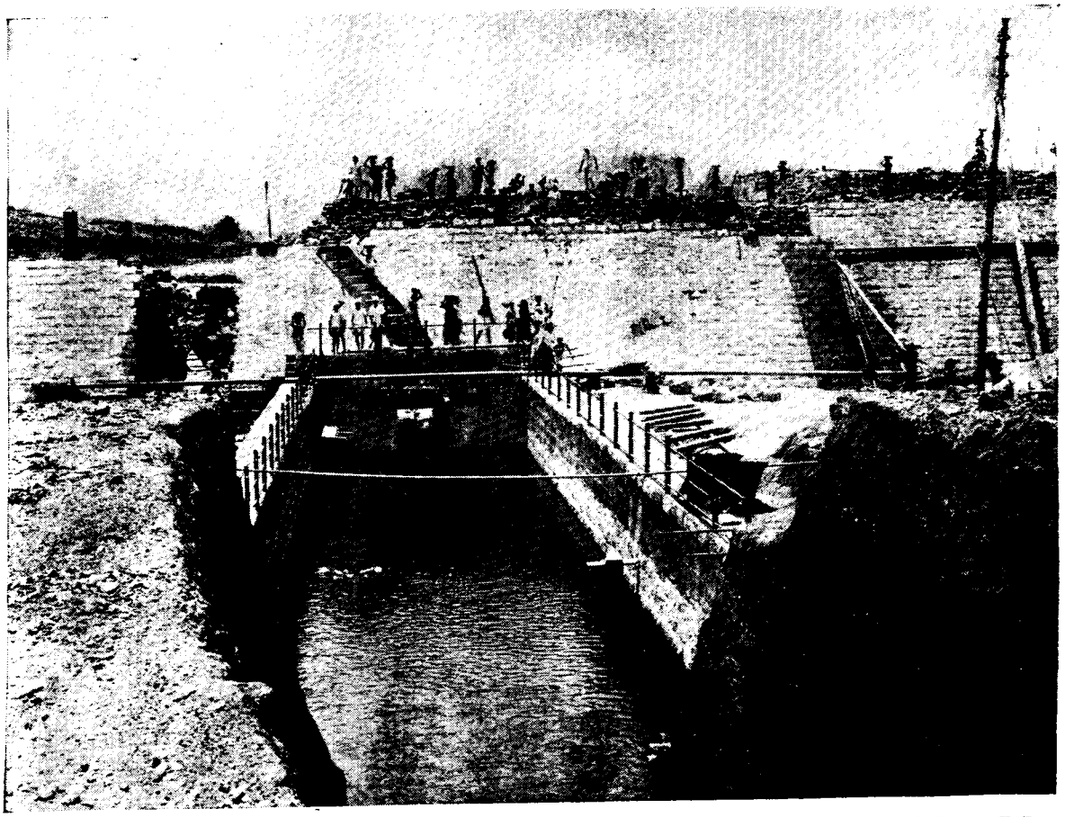
LOWER BHAVANI PROJECT

JANUARY 1952—EARTH DAM IN FORMATION.



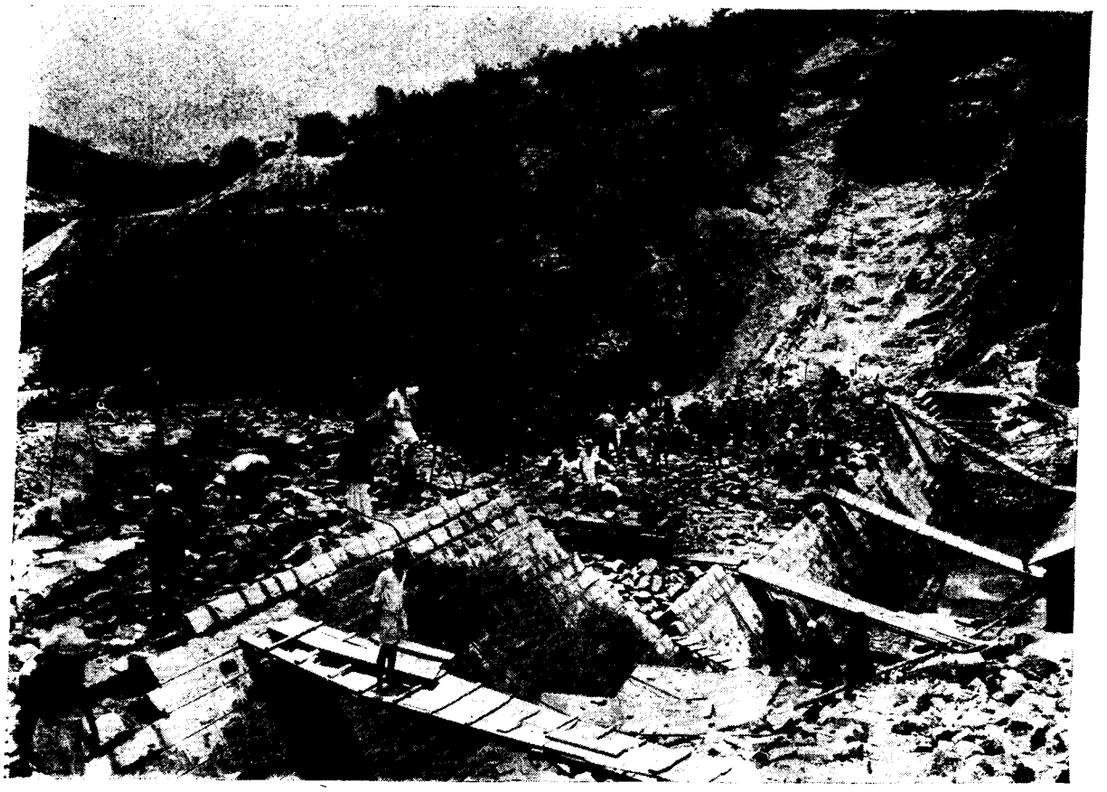
MALAMPUZHA PROJECT—MASONRY DAM—MAIN DAM—FRONT VIEW SHOWING LAKE AND RING BUND AT THE RIGHT FLANK SLUICES.

MALAMPUZHA PROJECT—MASONRY DAM—MAIN DAM—LENGTH 1,806 FEET REAR VIEW.

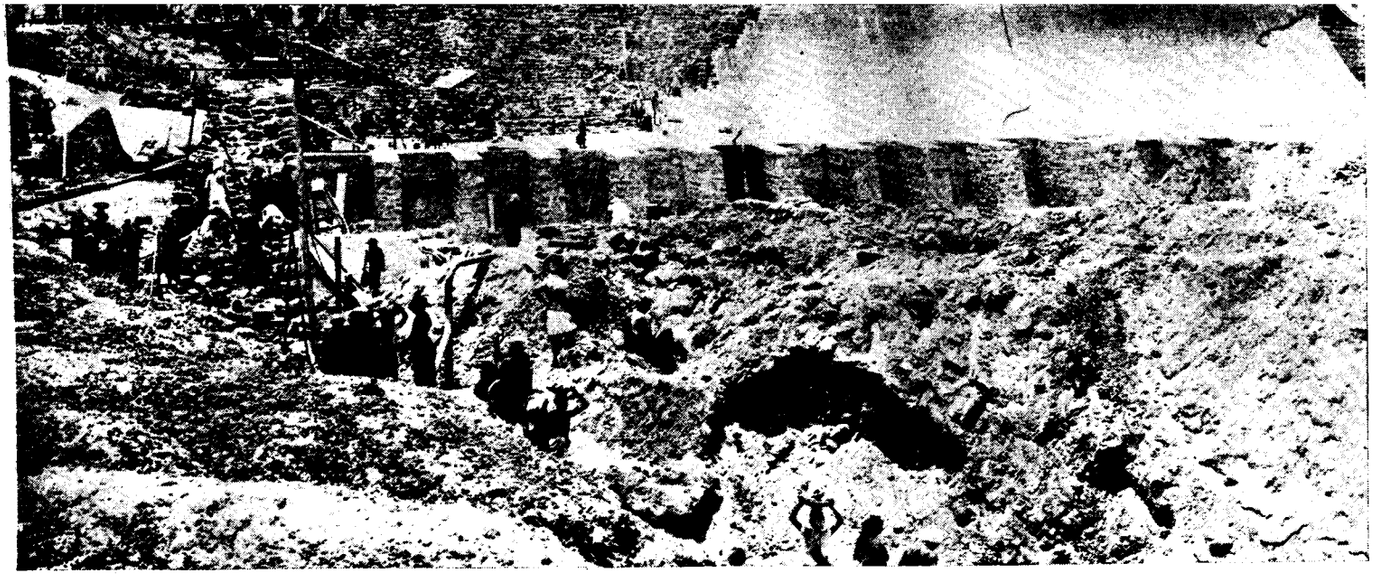


MALAMPUZHA PROJECT—MASONRY DAM—MAIN DAM—RIGHT FLANK SLUICE REAR VIEW (THE PRESENT RIVER DIVERSION) GAP FOR THE PALGHAT WATER-SUPPLY PIPE SEEN ON LEFT.

MALAMPUZHA PROJECT—MASONRY DAM—LENGTH 1914 FEET FRONT VIEW—LEFT FLANK.



MALAMPUZHA PROJECT—MASONRY DAM—REAR VIEW—RIGHT FLANK.

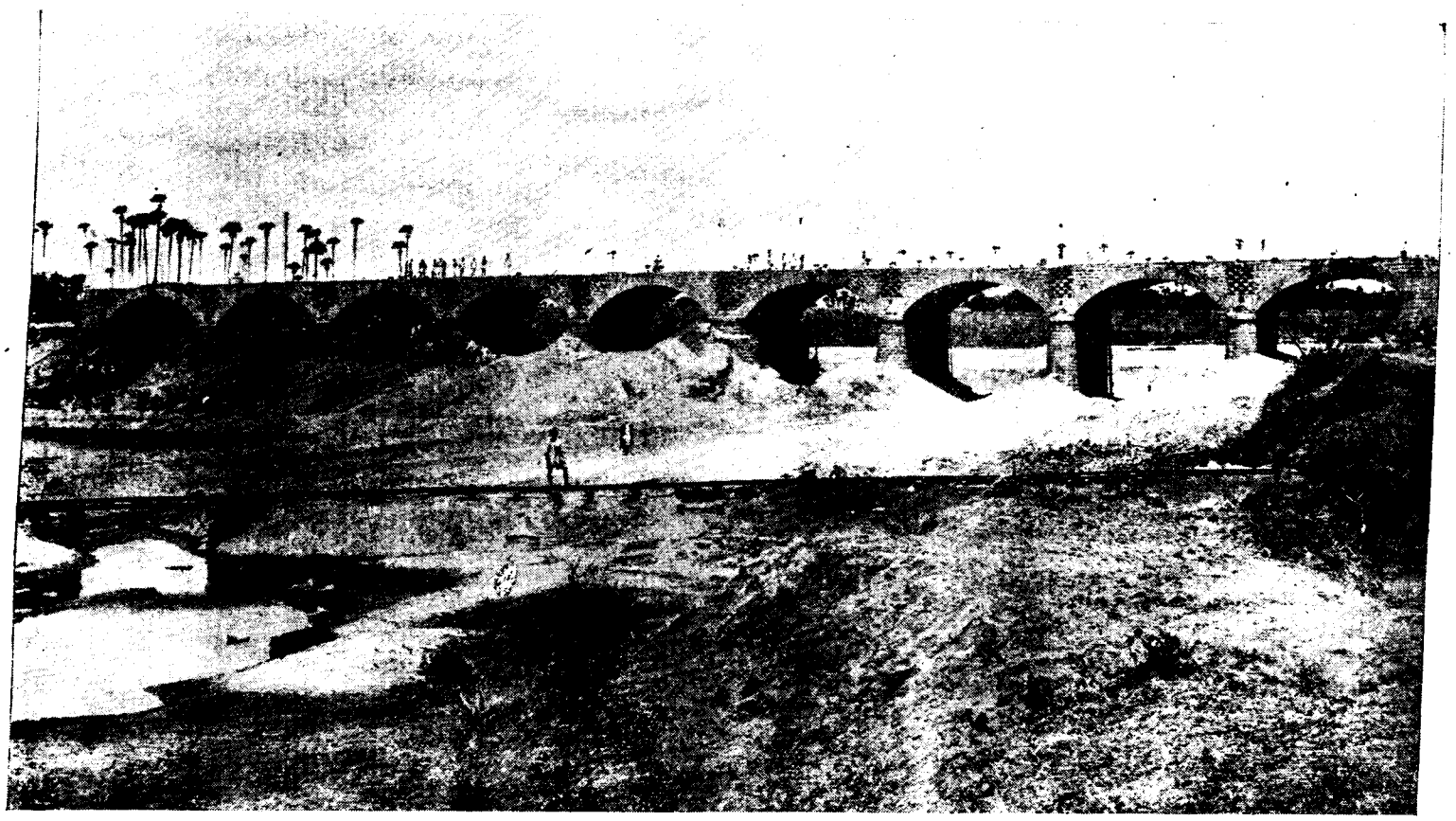


MALAMPUZHA PROJECT—MASONRY DAM—MAIN DAM—SPILLWAY SECTION—LENGTH 186 FEET WITH BAFFLE WALL COMPLETED AND OGEE CURVE IN PROGRESS.

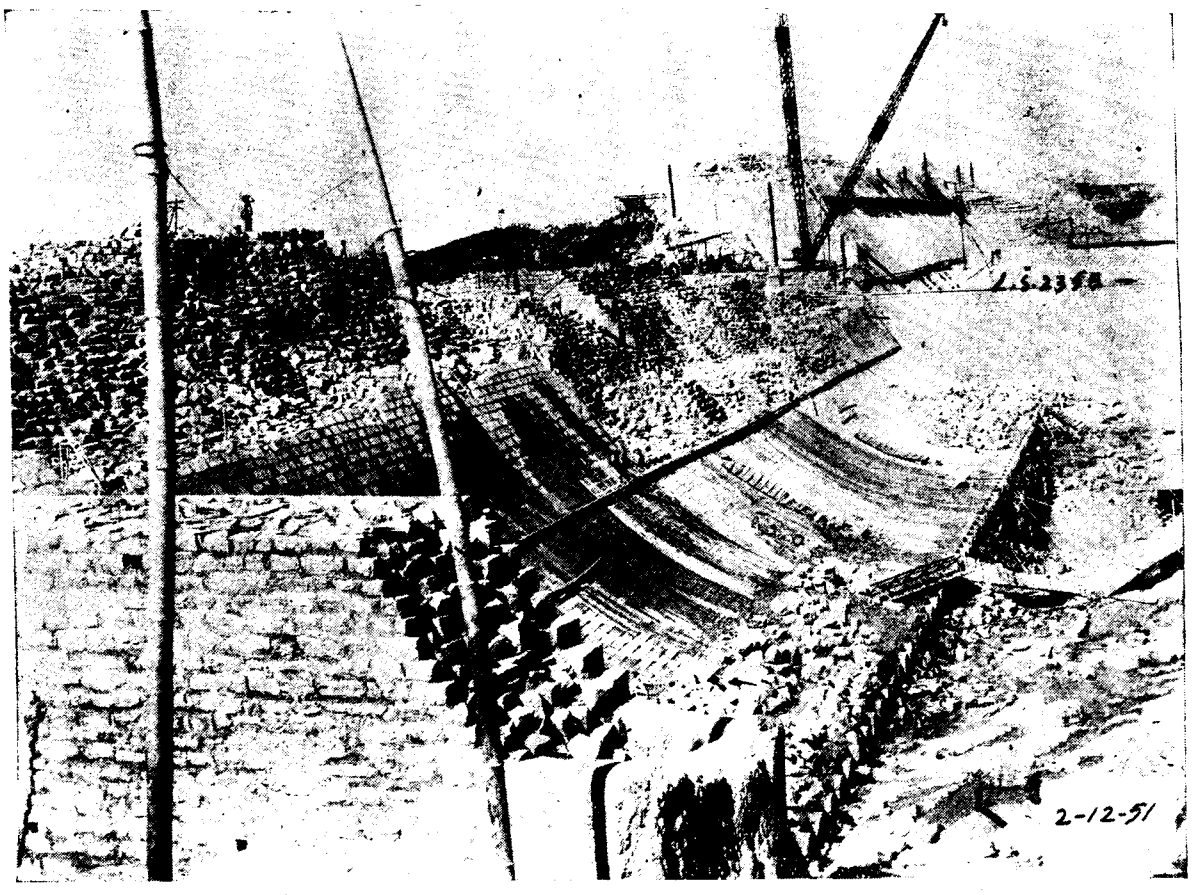
MALAMPUZHA PROJECT—PANORAMIC VIEW OF THE DAM—MAIN DAM AND PORTION IN LEFT FLANK AND EARTH DAM IN THE DISTANCE AND PARTLY FORMED RESERVIOR.

MALAMPUZHA PROJECT—PANORAMIC VIEW OF EARTH DAM (LENGTH 729 FEET MASONRY DAM AND RESERVOIR, VIEW FROM GOVERNOR'S HILL).

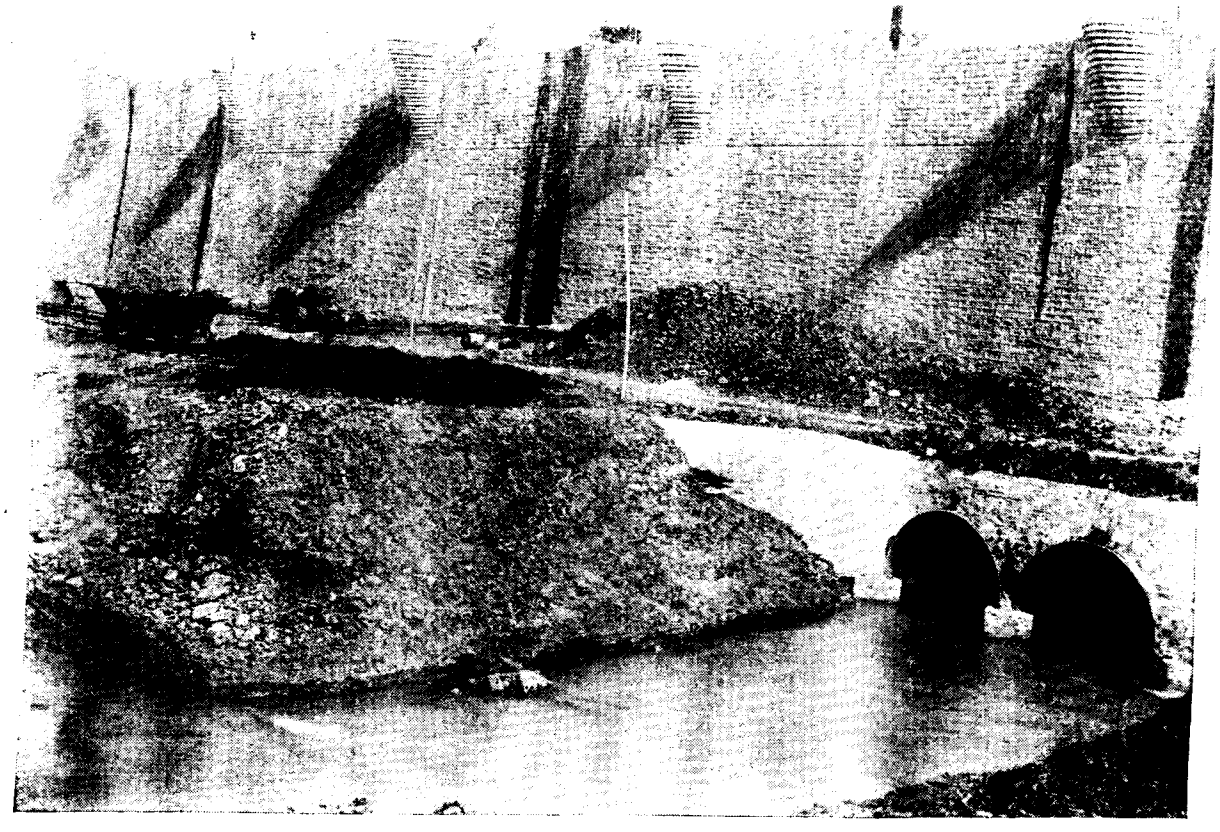
MALAMPUZHA PROJECT—VIEW OF KORAYAR AQUEDUCT WITH 6 ARCHES COMPLETED AND 4 ARCHES IN PROGRESS (19TH MAY 1952).



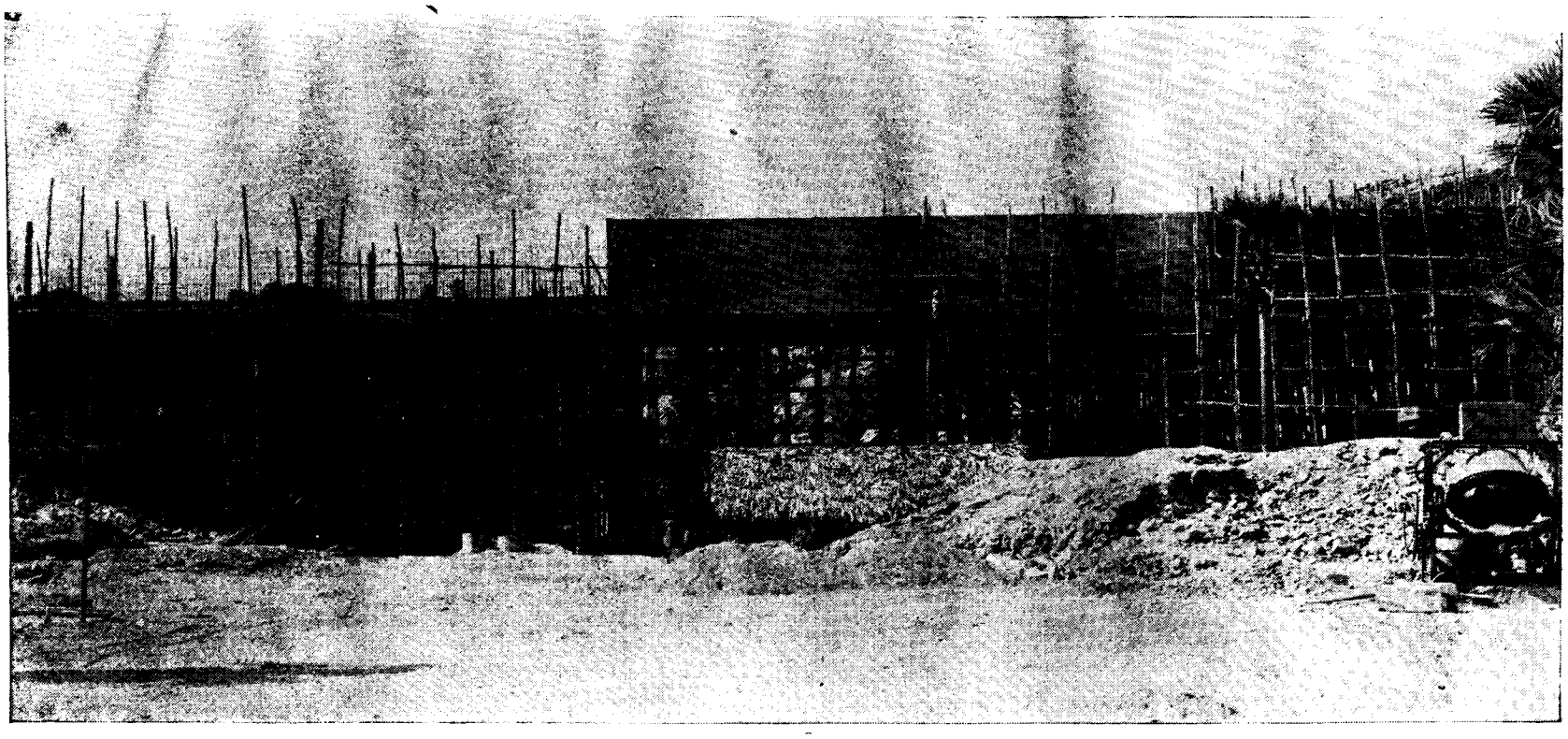
MALAMPUZHA PROJECT—VIEW OF 9 COMPLETED ARCHES (OUT OF 13) OF KANNADI AQUEDUCT (7TH MAY 1952).



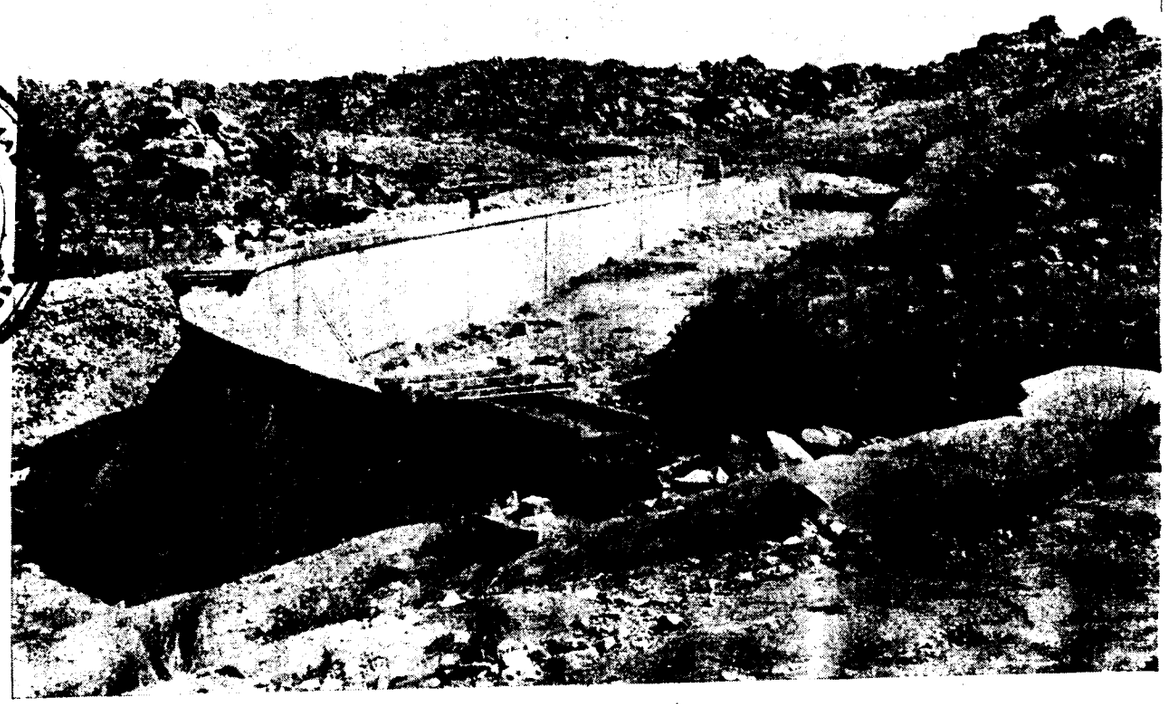
TUNGABHADRA PROJECT
PHOTO SHOWING THE REAR CURVED BUCKET OF SPILLWAY AND WORK IN PROGRESS IN BLOCKS 11 TO 15.



TUNGABHADRA PROJECT
RIVER DIVERSION THROUGH THE CONSTRUCTION SLUICES, TWO SPANS OF ELEPHANT ARCH BRIDGE ARE SEEN.
THE DAM AND CORBEL BASES ARE ALSO SEEN.



TUNGABHADRA PROJECT
AQUEDUCT ACROSS THE I VALLEY AT MILE 4–7–0 OF MAIN CANAL SUPPORTED ON R.C. COLUMNS.



TUNGABHADRA PROJECT—TYPICAL MASONRY SIDE WALL AT MILE 5-1-35 OF MAIN CANAL.