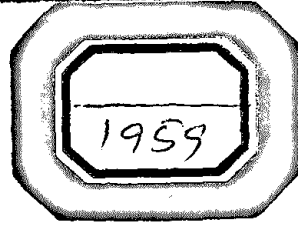


COPP/MIT/1959/3



REFERENCE ONLY

REPORT
ON
MINOR IRRIGATION WORKS
IN
MADRAS STATE

D2.2116
Jg

COMMITTEE ON PLAN PROJECTS
(Irrigation & Power Team)
NEW DELHI
November, 1959

TRAVANCORE-COCHIN
LEGISLATURE LIBRARY

Section : *D.*

Title : *Report on Minor Investigation
works in Madras State.*

Stock No. *30694*

Shelf No.

30694
17-2-60



**REPORT
ON
MINOR IRRIGATION WORKS
IN
MADRAS STATE**

COMMITTEE ON PLAN PROJECTS
(Irrigation & Power Team)
NEW DELHI
November, 1959

02.2115

J9 .

LETTER OF TRANSMITTAL

No. COPP/I&P/25/59
Committee on Plan Projects.

Vice Chancellor's Lodge,
Roorkee.

Dated the 30th November, 1959.

Dear Shri Pant,

It is a matter of profound pleasure for me to forward herewith the Report of the Minor Irrigation Projects Team on Minor Irrigation Works in the State of Madras. The study and investigations were conducted and the Report was finalised under the able Leadership of my predecessor, Shri N. V. Gadgil.

The Team's main recommendation is to reclaim Peramboke lands under the tanks according to a phased programme to be included in the Third Five Year Plan. The observations and recommendations of the Team included in the Report are based on an on-the-spot study of Minor Irrigation Works in the State. The comments of the Madras Government and the Food & Agriculture Ministry are given in Appendix XVII.

I take this opportunity of thanking you for the close personal interest evinced by you in the investigations and for guidance from time to time during the study.

With respects,

Yours sincerely,

A. N. KHOSLA.

Shri Govind Ballabh Pant,
Minister for Home Affairs,
Government of India,
NEW DELHI.

CONTENTS

CHAPTER	SUBJECT	PAGES
	Preface	(i)-(ii)
I	Water Resources and their Utilisation	1-8
II	Priorities for Selecting Projects and Maintenance of Works	9-13
III	Features of Designs and Construction	14-18
IV	Desilting- <i>cum</i> -Reclamation Scheme	19-22
V	Betterment Levy and Water Rate	23
	Summary of Recommendations	24
	Appendices	25—88

MAPS

Sl. No.	Subject	Facing page
1.	Map of Madras State	2
2.	Index Map—Desilting- <i>cum</i> -Reclamation Schemes in Chingleput District	20

PREFACE

This is the second Report in the series of Reports being issued by the Minor Irrigation Team, appointed by the Committee on Plan Projects for study and investigation of minor irrigation works in the States of Andhra Pradesh, Mysore, Madras, Kerala, Uttar Pradesh and Punjab. The Terms of Reference were communicated to the Leader of the Team by the Committee on Plan Projects under Memorandum No. COPP/(4)/17/58 dated the 4th August 1958 (Appendix I). The composition of the Team was as follows :—

Shri N. V. Gadgil	.. .. .	Leader
Shri Lal Singh, Director of Agriculture (Retd.) Punjab.	.. .. .	Member
*Shri M. Narasimhaiya, Chief Engineer (Retd.), Mysore.	.. .. .	Member
Shri Mahavir Prasad, Irrigation Adviser to the Government of India, Ministry of Food & Agriculture.	.. .. .	Member Ex-officio

Shri D. S. Borker, Secretary to the Consultative Committee, Irrigation & Power Projects also worked as Secretary to the Minor Irrigation Team.

2. The Team adopted the same method of study as in the case of Mysore State. Preliminary discussions were first held by the Team with the State Authorities and a plan of work chalked out in mutual consultation (Appendix II). The Members of the Team visited the Madras State during the period July-September 1958 specially the districts of Ramanathapuram, Madurai, Chingleput and Coimbatore to study the Minor Irrigation Works and discussed the important problems involved with the Chief Engineer and other concerned officials. Also case studies were carried out on some tanks in operation, selected at random from the districts of Chingleput, North Arcot, Madurai, Ramanathapuram and Tirunelveli.

3. The Government of Madras have shown great appreciation of the need for developing minor irrigation projects on efficient and economical basis with a view to encouraging attainment of higher target of food production. This was also emphasised by the Minister for Agriculture, Shri M. Bhaktavatsalam during the Southern Regional Minor Irrigation Conference held at Hyderabad in July 1958.

4. The Team's main recommendation is to reclaim Peramboke lands under the tanks according to a phased programme to be included in the Third Five Year Plan.

5. Shri V. T. Krishnamachari, Deputy Chairman, Planning Commission took consistent interest in the conduct of these studies and discussed the Team's preliminary findings with the Government of Madras when he was last there. He was told that the Government of Madras were not in favour of selling foreshore lands on which the silt (removed from the bed of tanks) is spread. Instead they preferred to use the reclaimed land for community

* Ceased to be Member from 22nd February, 1959.

purposes such as nursery beds, tree-planting etc. In the opinion of the State Government, adoption of such measures would help to conserve the soil. The Deputy Chairman, however, has advised the State Government that where lands are valuable, there should be no hesitation in selling and recouping the expenditure incurred on renovation.

6. We take this opportunity to record our gratitude to the Madras Government for the facilities extended during our study and the spirit of accommodation shown by all concerned officers. We are specially indebted to Shri K. Kamaraj Nadar, Chief Minister, Shri M. Bhaktavatsalam, Minister for Agriculture, Shri P. P. I. Vaidyanathan, ICS, Secretary, Agriculture & Food Production Department, Shri U. Ananda Rao, Chief Engineer and Shri K. V. Ekambaram, the present Chief Engineer dealing with the Minor Irrigation schemes.

CHAPTER I

WATER RESOURCES AND THEIR UTILISATION

1. Resources

1.1. Madras State comprises 13 administrative districts with an area of 50,334 square miles. Maximum rainfall is of the order of about 75" and occurs only in Nilgiri District with an area of 989 square miles. In the rest of the State, the rainfall ranges from a maximum of 47 inches to a minimum of 30 inches (occurring in the Tirunelveli District). As the Western Ghats over-shadow the South West Monsoon, contribution of this Monsoon to total rainfall is comparatively low in certain districts. Districtwise annual rainfall, contribution of North East Monsoon and annual percentages are as follows :—

	Total Rainfall (inches)	North East Monsoon (inches)	Percentage Annual (inches)
Madras	50.78	31.78	62.6
Chingleput	46.70	27.22	58.3
South Arcot	46.48	25.59	54.6
Tanjore	44.39	26.09	58.8
Ramnad	31.71	17.69	55.8
Tirunelveli	29.83	18.75	63.2
Madurai	31.92	15.54	48.7
Tiruchirapalli	34.70	15.97	46.0
North Arcot	38.01	15.13	39.8
Salem	32.33	11.23	34.7
Coimbatore	33.61	12.86	38.3
Nilgiris	74.45	19.49	28.2
Kanyakumari	40.00	18.00	45.0

1.2. The tract immediately to East of the Ghats for a width of about 40 to 50 miles where the elevation ranges from about 600 to 1500 feet above the sea level, comprises low hills and valleys whereas rest of the area is comparatively flat with an elevation ranging from 500 to 100 feet in regions closer to the sea coast.

1.3. Most of the rivers flowing through the State have their sources in the neighbouring State of Mysore. A large number of works had been constructed in both the States along the river valleys several centuries ago. The utilisation was restricted to the construction of tanks and anicuts and channels to a maximum extent with the limited resources available at that time. Construction of high dams to store the surplus waters flowing into the sea is a

recent development. The two erstwhile States of Madras and Mysore came to an *Agreement in as far back as 1892 when rules were framed defining the limits within which irrigation works could be undertaken by Mysore State in the various valleys. The provisions were such that not only the riparian rights of Madras State were protected but they allowed scope for further development. As per recent assessment, 86 per cent of waters has been tapped.

2. Utilisations

2.1. The factors mentioned above have determined the utilisation of water for purposes of irrigation. The run off (yield) in various taluks has been determined and tabulated so as to serve as a good basis for preparation of projects (Appendix IV). The various systems of water utilisation are as follows :—

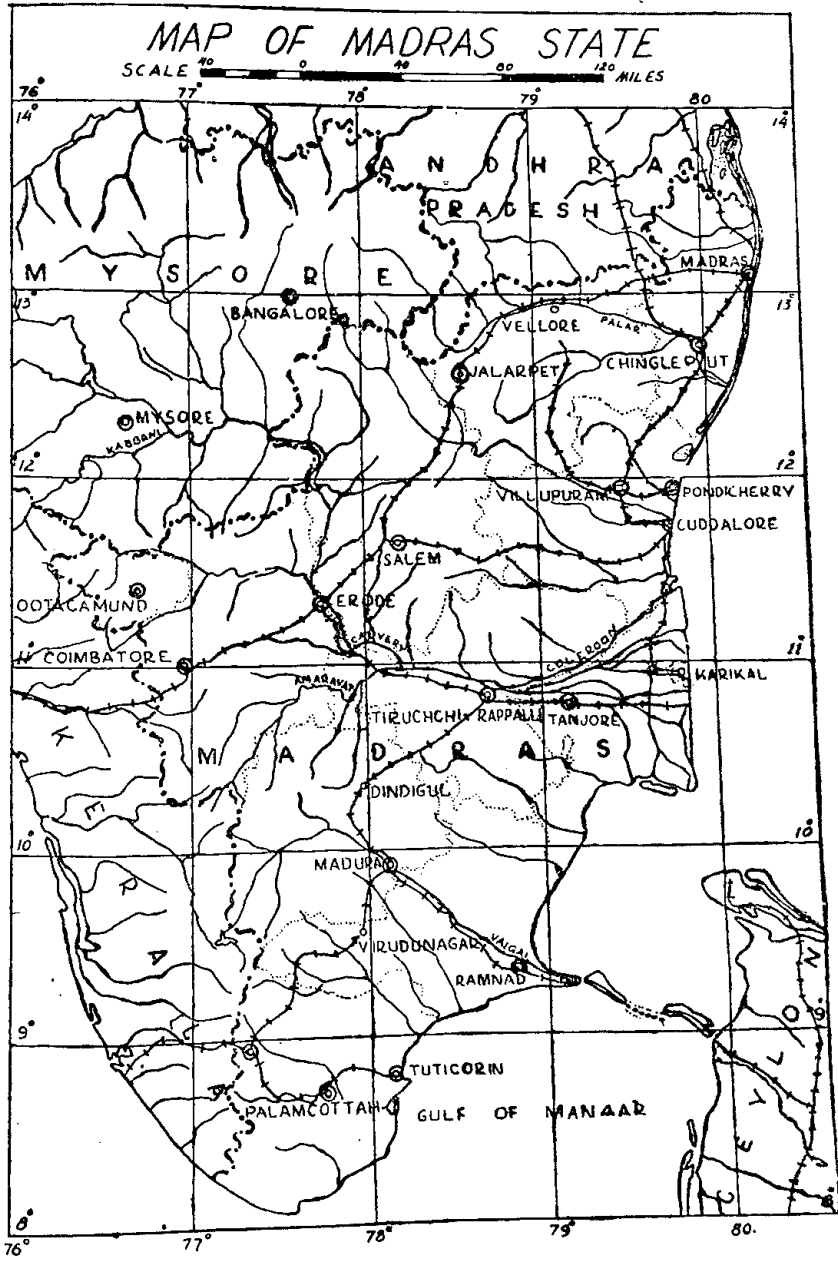
- (i) Anicut systems have been in existence for several centuries and cultivation has developed and available water utilized to the maximum. The Grand Anicut and the Upper Anicut across Cauvery river are outstanding examples of structures put up long ago. The irrigated area in each of the major river valleys is as follows :—

	Acres
Araniyar river	24,000
Kortaliyar river	26,216
Cooum river	13,000
Adyar river	300
Palar river	1,72,746
Ponniyar river	70,588
Varahanadhi river	7,055
Vellar river	1,06,230
Vaigai river and Periyar	2,49,000
Tambaraparani	1,16,000
Kodayar river	60,000
Cauvery river	15,12,469

- (ii) The sites for large reservoirs which have recently come into being, are in the Western side of the State and they have been fully exploited by construction of dams and channel systems, like Mettur, Lower Bhayani, Amaravathi, Krishnagiri, Satanur and Vaigai. It is stated that utilisation of water from rivers and streams has been so exhaustive that possibilities of further storage works are insignificant. In fact schemes are under examination for diverting West flowing rivers to East by tunnelling through the Western Ghat under an agreement with Kerala State.

- (iii) Medium and Minor tanks had been constructed several centuries ago across streams. There are as many as 32,318 tanks in the present State, the largest number (6686) being in Ramnad district

*Please see Appendix VI, Report on Minor Irrigation Works in Mysore State—September 1959.



which has an area of 4825 square miles. Districtwise distribution of tanks is as follows :—

Name of District	Area in sq. miles	Number of tanks
Madras	49.74	—
Chingleput	3,060	2,909
South Arcot	4,208	2,917
North Arcot	4,654	3,421
Salem	7,058	2,550
Coimbatore	7,090	127
Tiruchirapalli	5,505	5,656
Tanjore	3,738	859
Ramnad	4,825	6,686
Madurai	4,869	4,326
Tirunelveli	4,338	2,929
Nilgiris	989	—
Kanyakumari	640	1,107

- (iv) In flat country water has been drawn from streams by means of open channels, from time immemorial. These inundation canals are utilised for feeding mostly the systems of tanks and also irrigating small areas directly. The supply channels drawn from Vaigai river are typical examples (Appendix V). The number of such channels is 58, supplying 283 tanks protecting an aggregate ayacut of 1,20,555 acres.
- (v) In addition to the above irrigation sources, in certain regions where beds of streams are sandy and good subsurface flow of water exists even after the discharge in the river has ceased, supplies of water for irrigation are drawn from spring channels which are excavated sufficiently deep below the bed year after year. This is largely prevalent in the districts of Chingleput and North Arcot.
- (vi) Subsoil water has also been utilised by means of a large number of wells. With the advent of power, lift irrigation by means of pumps has been expanding rapidly. There are as many as 7,69,694 wells of which 4,214 are Government wells and the rest private wells. Of the private wells, 5,45,246 are pucca masonry wells and 2,40,234 are non-masonry wells. Of the total area irrigated, the area irrigated by wells amounts to 21.2%.
- (vii) In Coimbatore district a number of big deep wells, some of which are 100 to 150 feet deep with additional bores of 200 to 300 feet irrigating as much as 50 acres each have been sunk for purposes of irrigation.

(viii) In sandy areas on the coast where sea water has no effect and fresh water is available, 'filter points' are installed. These are becoming very popular and a large number of them are being installed every year. The scheme was started in 1951-52 and 2,671 filter points were sunk at a cost of Rs. 58 lakhs during the First Plan period. The area commanded by a normal filter point is ten acres. The procedure for granting loans to ryots for the hire-purchase of 'filter points' is given in Appendix VI.

2.2. Out of the total irrigated area of about 55,71,000 acres about 20,50,000 acres are by large reservoir and anicut systems. The 33,487 minor and medium tanks irrigate nearly 22,00,000 acres.

It is observed that :—

- (i) Most of these tanks were till recently zamin and have been in a state of disrepair due to continuous neglect and without proper surplus or escape arrangements. Further, when there was heavy cyclonic storm in 1955 a large number of these tanks got breached.
- (ii) In course of time the tanks got deteriorated on account of continuous process of silting resulting in loss of capacity. Due to beneficiaries not attending to the removal of silt as before and neglecting maintenance of supply channels, the supplies are not adequate for the entire ayacuts. Irrigation is, however, improving due to the restoration of the tanks undertaken to make up for the lost capacity.

2.3. Efforts have been made to take off supply channels from streams to feed the tanks. An outstanding example, as stated earlier is the Vaigai system. This stream neither is perennial nor has a large catchment. The available flows which last for barely a fortnight, are diverted by means of earth bunds and channels taken off in open cuts.

2.4. As there are neither masonry weirs nor regulators in many of these, supplies to the several systems of tanks in the valley are not equitably distributed. The supply channel at the upper reaches, therefore, draws off a large quantity of water allowing very little for the channels drawn off at lower reaches of the streams. It is, therefore, an urgent necessity for

- (i) Replacing the earthen bunds now being put every season by masonry anicuts with scouring sluices and
- (ii) Providing Regulators for the supply channels, which would be of a more permanent nature and while regulating the supplies to the upper tank systems, can ensure the supply to the lower tank systems, thus utilising the water properly and fully.

2.5. Anicuts have also been constructed across minor streams with perennial flows. These are now being intensified, specially in the Krishnagiri taluk of Salem District which was once a zamin area. Markandeya and Ponnar rivers and their tributaries admit of construction of anicuts across them. The old anicuts which are in a state of dilapidation are now being reconstructed and put to more efficient use.

2.6. Out of the total area of about 5.6 million acres the well irrigation accounts for 1.233 million acres. With the advent of electric power and a rapid extension of power lines all over the rural area the well irrigation has

received a great impetus. There are at present 75,000 pumpsets run by electricity supplied by the State Electrical Grid. With the completion of the programme under the Second Plan it is expected to bring in nearly 1,00,000 pumpsets under the grid.

2.7. In Coimbatore District where the rainfall is 34 inches, there are hardly 150 tanks. The cultivators in this area have developed lift irrigation from wells at considerable cost. The wells are as deep as 150 ft. with extra bores of 8" to 9" dia at the bottom for another 200 to 300 feet depth to augment the supply and pump water for cultivation. On account of heavy cost of cultivation from these deep wells, cultivators generally grow cash crops such as bananas, cotton, sugarcane, tobacco and flowers. Food crops like paddy and ragi are grown only to meet the needs of the cultivator.

Enormous expenses have been incurred by the people to secure water for irrigation. Villagers have spent Rs. 30,000 to Rs. 40,000 on a well for constructing open percolation wells to a depth of even hundred feet through rocks. The Team had the opportunity to see several such wells. In a village situated 3 miles from Coimbatore, an open well was constructed at an estimated cost of Rs. 1,18,000 involving a lot of cutting and wedging rocks over a period extending almost three generations. And even then the supply of water was hardly sufficient to feed a 5" pump. In another case, a well has been dug at a cost of about Rs. 75,000 and water lifted from a depth of 120 ft. and taken through the underground pipes to the farm to avoid any wastage of water on the way.

2.8. At many places the tanks existing in the neighbourhood of open wells were found to receive scant attention in the matter of water conservation. An extreme example of this kind was noticed in the case of Amman Kulam Tank, in Peelamedu Village about three miles from Coimbatore. The loss due to vast areas occupied by tanks becomes all the more glaring when the abnormally high price of land adjoining the tanks is taken into consideration. As an instance, tanks situated near Coimbatore Town particularly those adjoining Madras Agricultural College could be quoted. They cover a couple of hundred acres with a storage capacity of a tank of one-fourth of their present expanse. In fact, most of these tanks were almost completely silted up. The value of land adjoining these tanks is over Rs. 6,000 per acre, and this tank bed also could easily fetch the same price.

2.9. After the rains, flow of water in several streams dwindles down and the supply channels cease feeding the tanks with the result that lands at tail end do not get adequate supplies. The sub-surface flow in the sandy stream is also tapped. Recourse to excavating deep channels in the river bed to carry this water to the fields lower down on the banks is taken. Similar supplies are also made to lands that are purely rainfed.

2.10. Filter points, a device for pumping out water from sandy substrat for irrigation purposes, have been installed recently to bring additional area under irrigation. A large number of these are found in Tanjore District of Cauvery, Srirangam area of Tiruchirapalli District and in the sandy areas in Districts of North Arcot, South Arcot, Madurai, Ramnad, Chingleput and in a small measure in Salem.

2.11. The Team was impressed with the work of filter points in the State. Their construction should be encouraged, but care need be taken to modify the design to suit local conditions. Something that has been successful in Cauvery area may not suit conditions in tapping the finer sands that con

across in the District of Ramanathapuram. It is suggested that different design for the filter should be used. Instead of driving the filter into position it may be advisable to instal it inside a bored hole.

2.12. The two schemes of well construction and installation of pumpsets are popular in the State. These schemes are, however, administered by two separate Departments of Revenue and Agriculture. If their implementation is properly coordinated, there is good chance of fuller use being made of sub-surface water. At present plentiful groundwater supply available at large number of wells remains unutilised, because no pumpsets have been installed. The Agriculture Department responsible for planning the pump-set installation is not always aware of the programme of well construction.

2.13. Through installation of pumping sets along the streams and drains, there are good prospects of expanding irrigation. Before, however, deciding sites for lift irrigation it is important to ascertain all-the-year-round availability of water source. Lift irrigation can be economical only if it can be kept running for at least 200 days in the year. Also care need be taken not to over-capitalise its installation. This has been a serious handicap to the installations so far attempted by the State.

3. Irrigation Tanks

3.1. In Mysore State, exact information about the water-spread area and ayacut of tanks was available and compiled in respect of about 25,000 tanks out of a total number of about 35,000 tanks from the old memoirs of the State Irrigation Department and the ratio of waterspread to ayacut worked out to 5:6 or an acre of waterspread to 1.2 acre of ayacut. In Andhra State also, similar information was compiled, but only in respect of about 5,000 tanks taken as sample from the total number of 58,527 tanks in the State, and the ratio of waterspread to ayacut worked out to 1 to 1.3. In Madras State, however, detailed information in respect of waterspread of tanks was not available except that the total irrigated area of about 22 lakh acres was commanded by 33,687 tanks in the State.

3.2. Visits to a number of tanks in Madras State gave a general impression to the Team that the condition of tanks in this State was more or less the same as in Andhra State, and this stands confirmed from a study of the following data made available by State Government in respect of 245 tanks, and the relationship existing between the ayacut and water-spread area of these tanks.

Particulars	No. of tanks	Total ayacut (acres)	Water-spread area (acres)	Ratio of water-spread : Ayacut
Paramakundy and Ramnad Taluk Supply Channel ..	90	20,544	26,620	1 : 0.87
Ramnad	127	16,562	7,520	1 : 2.20
Coimbatore town tanks ..	15	6,831	2,571	1 : 2.70
13 Tanks (Desilting-cum-Reclamation)	13	6,136	2,629	1 : 2.40
TOTAL ..	245	50,073	39,340	1 : 1.30

3.3. Even in the absence of exact information about water-spread of tanks in the State and considering that conditions obtaining in Andhra and Madras States are almost similar, and Andhra formed previously a part of Madras State, it would perhaps be safe to presume that the ratio worked out in respect of 245 tanks in Madras State should broadly conform to all the tanks in the State. Based on this ratio the water-spread area of 33,687 tanks in Madras State corresponds to nearly 17 lakh acres against an ayacut of about 22 lakh acres.

3.4. In view of the vast area of waterspread of these tanks, evaporation losses from the free water surface need to be fully appreciated. Average evaporation losses in different parts of Madras State* vary from 57.72 inches in Coimbatore to 95.73 inches in Madurai, giving an average of 75 inches per year for the State as a whole. Actual percolation losses from the bed of tanks have not been calculated, but according to experiments **8 ft. of sub-soil of normal texture is known to absorb as much as 4 ft. of water. Percolation losses have at least one redeeming feature in as much as the water percolating into the sub-soil can partly be recovered by lift irrigation, although at considerable cost, but evaporation losses are a dead loss.

3.5. It is for this reason that in all advanced countries of the world a great deal of experimental work is in progress to prevent evaporation losses from free water surface of even those tanks where water is very deep and surface area is not large. In India experimental work has also been started to devise ways and means of reducing evaporation losses from tanks by the use of Cetyl Alcohol and it may soon be possible to ascertain its economics and evolve economical methods to diminish such losses. Conditions in India are particularly conducive to evaporation losses in view of the vast expanse of water-surface of tanks, shallow depth of water and growth in tanks of abundant weeds. Weeds are specifically responsible for water losses through transpiration and which are also estimated to be almost as heavy as evaporation losses.

3.6. The Team was satisfied to see that Madras State had already undertaken experimental work on desilting in some tanks, and some valuable experience has been gained and data collected. The main objective of the desilting scheme in the State had so far been to restore the lost storage capacity of the tank and not so much the reclamation of land. Earlier the silt removed from the tank was partly used to raise the waste-weir or bank of the tank and partly deposited on privately owned lands, which were thus made more productive. The Department, however, did not get any financial credit for this work. On the contrary, it had to secure the permission of the owners of private lands for depositing silt. Recently desilting has been combined with reclamation, so that the silt removed is not only used for raising the waste-weir, but also raising the fore-shores of the tank, thereby increasing the depth of the tank but reducing its size and reclaiming a portion of the land under the tank. Appendix XIV gives an idea of the cost of desilting and the extra ayacut for which irrigation became possible as a result of desilting. The cost of irrigation per acre varied from Rs. 88 to Rs. 867 per acre, so that desilting was justified even on the basis of extra irrigation provided. This does

*Appendix XVI-showing annual evaporation losses in different parts of Madras State-
vide Scientific Notes Vol. VI Nos. 61-68 India Meteorological Department.

**USDA Agricultural Information Bulletin No. 71.

not take into consideration the amount of saving in evaporation and percolation losses as a result of reduction in the size of tank, apart from the value of land reclaimed from such tanks. Apart from this, considerable area was also reclaimed which was an extra gain. With the reduction of about 15 per cent in the size of tanks it will be possible to release 2.5 lakh acres of culturable land, which even on a conservative basis of one ton of food grains per acre, will produce annually 2.5 lakh tons of additional food grains. Unlike Mysore State where foreshore lands are invariably Government lands, tank lands in Madras State are both peramboke* lands and patta lands *i.e.* private persons having the right of cultivation. But in view of the additional land rendered available for cultivation, the "Desilting-cum-Reclamation Scheme" may first be undertaken on tanks satisfying two conditions namely (a) where waterspread is large as compared with anyacut and (b) lands are expensive as in the case of tanks near cities like Coimbatore where land prices are exorbitant, ranging from Rs. 10,000 to Rs. 15,000 per acre, so that reclamation cost is recovered by the sale or lease of lands even in the early stages of the project. When further experience in desilting is gained and work is systematized, the cost will automatically come down and the scheme may be economically justifiable even in the case of tanks with patta lands.

3.7. Detailed observations have been made in the Report on Minor Irrigation Works in Mysore State in connection with (a) treatment of reclaimed lands through plantation of suitable and remunerative grasses, (b) greater utilization of sub-soil water by lift irrigation, (c) need for survey organization to survey all areas having shallow sub-soil water, (d) utilization of water for irrigation on the flanks of rivulets and streams, (e) suitable modification in the crop pattern and change in the dietetic habits of the people, (f) intensifying experimental and demonstration work on dry farming and (g) greater and more effective co-ordination between Agriculture & Irrigation Departments. These observations are equally applicable to Irrigation Tanks in Madras State.

*Government lands.

CHAPTER II

PRIORITIES FOR SELECTING PROJECTS AND MAINTENANCE OF WORKS.

The State Government has formulated rules fixing the criteria for undertaking projects under the Special Minor Irrigation Schemes financed by the Government of India and being operated in the present Plan Period (Appendix VIII). These schemes include:—

- (a) repairs to minor irrigation works such as tanks, anicuts and channels;
- (b) surface percolation wells—their construction, deepening and repairs; and
- (c) land improvement works.

On account of loss of capacity there is a reduction of ayacut over the original ayacut and consequent loss of revenue. Restoration works are intended to cover this deficit, which is called a gap, only partially, heavy silting being in some cases as high as 50% of the original capacity and complete restoration being economically impossible or even impracticable for obvious reasons. Selection of these projects is governed by a number of factors such as availability of water, existing rights above and below the tank. In so far as financial aspect is concerned, the rules define that only such projects the cost of which does not exceed Rs. 1,500 per ton of extra food expected to be produced by the implementation of the project, should be taken. It is assumed for this purpose that the portion of the gap covered would yield 1/2 ton per acre and for the assured supply the present ayacut would yield an additional 1/8 ton per acre. It is also laid down that Government can sanction, in exceptional cases, schemes that would not satisfy these conditions.

2. The zamin sources are on account of long neglect, mostly in a state of disrepair and irrigation under them is in a precarious condition. The Government has, therefore, liberalised the rules whereby all repair works under the zamin sources are undertaken provided the expenditure does not exceed Rs. 300 per acre of ultimate ayacut. On enactment for the abolition of zamins and inams in 1952, the Public Works Department organised a Special Circle to carry out repairs that were urgently needed for irrigation sources.

3. Special Minor Irrigation Programme was launched from Central Government grant in 1956. Subsequently, the Circle was reorganised as Food Production Circle and also took over restoration works from Revenue Department. The Food Production Circle is under the administrative control of the Commissioner for Food Production (who is also a Member of the Board of Revenue) assisted by a Superintending Engineer as also the Chief Engineer, Public Works Department, in so far as minor irrigation programme is concerned. Five hundred and twenty-four works were sanctioned at an estimated cost of approximately Rs. 49 lakhs benefitting an area of about 13,000 acres with an anticipated additional food production of 7,197 tons, during the year 1957-58. Of these 166 were completed at a cost of Rs. 11.5 lakhs, total outlay being Rs. 35.5 lakhs on all the works. Seven hundred and seventy one works including the incomplete works of the previous year, at a total cost of approximately Rs. 90 lakhs, comprised the programme for the year 1958-59 (Appendix IX).

4. Selection of projects and fixing up of priorities depend mostly on availability of adequate irrigation facilities and keenness of the local people for taking up such schemes. Returns on the investment are secondary.

5. The practice at present is that the Collector initiates all irrigation repair works. Those that have an ayacut of 50 acres and more are given priority. Investigation and construction of such works is conducted under Special Minor Irrigation Programme. In the case of major irrigation works under the control of the Revenue Department a preliminary report indicating the feasibility and cost of the repair work is sent to the Collector for his approval before investigation and execution are taken up. Repair works under the Public Works Department are undertaken by the Department itself, if permitted under the stipulated rules. Works are also taken up on representation from ayacutdars if the works are urgent and productive.

6. While restoration of damaged tanks in Ramnad District and other zamin areas, where they have not received attention during the last several years, should receive the highest priority, it is suggested that wherever supply channels to tanks have been taken from streams without any masonry works either for diversion or for regulation or both, such works may be given equal priority in as much as filling up of all tanks under such supply channels is essential for satisfactory cultivation of all ayacuts below these tanks.

7. The Public Works Department is in charge of the maintenance of all system tanks—that is tanks that draw their supplies from rivers across which anicuts have been constructed and have regular establishment for the regulation, maintenance and distribution, and non-system tanks with an ayacut of more than 200 acres. The Revenue Department is responsible for maintenance of all other irrigation tanks with an ayacut below 200 acres.

8. The State is in possession of valuable information in regard to tanks in form of Memoirs (Sample sheet at Appendix VII). This work was carried out several years ago. This is a distinct advantage for planning programmes of restoration works. Large irrigation sources which were taken over by the State from the zamindars have no Memoirs of this type. The Food Production Circle which is in charge of repairing these zamin tanks have, however, started preparing the Memoirs for these tanks and they need to be brought up-to-date.

9. The Team commends the procedure adopted by the Public Works Department for employing permanent Mistries and Laskars for the system tanks to attend to the operation of Head and other important Regulators in the supply channels and also maintain the channels. This staff has also to keep watch on flood banks, record daily readings of anicuts and head sluices and weekly readings of the gauges in the tanks. In the case of non-system tanks no such establishment is employed.

10. Repairs to bund like earth work for the top or the slope, repacking of displaced revetments, are carried out once in five or six years generally for both system and non-system tanks. Any emergent repairs to bund, sluice or surplus works are executed as and when brought to the notice of the authorities by the villagers or the village munsiff.

11. The Madras Compulsory Labour Act (1858)—also called Kudimaramath Act, legalises compulsory labour for the prevention of destructive inundation and enforcement of customary labour on certain works of irrigation in the State (Appendix X). The Act provides for calling upon able-bodied persons in a village at times of emergent repairs required to be done

to save a tank or canal or an anicut in the village from breaching. Even the head of the village is vested with powers to muster this labour when the irrigation Official or Tahsildar is not available. Any person who refuses to comply with such a call without lawful excuse is to be tried by a Magistrate and punished with a fine which may extend upto Rs. 100 or simple imprisonment upto one month, or both. Persons employed on such work are to be paid for their labour at the highest rate paid in the neighbourhood for similar work and if they are required to work at night, at double such rate. Specific rules have been laid down for systematic maintenance and repair of minor and major irrigation works including maintenance of a ledger (Appendix XI) by the Revenue and Public Works Departments. These rules are revised from time to time.

12. On receipt of proposals from Tahsildars regarding the repair works to be executed in the following year on the basis of information available in the Registers, the Collector used to draw up a programme of repairs to minor irrigation works not later than December of the preceding year in order of their urgency and allot funds for implementing the programme.

13. Information regarding sources in need of repairs used to be collected from Revenue Inspector's diaries, Jamabandi check memoranda, reports of Tahsildars and sometimes from petitions received from ayacutdars and works taken up according to required priorities. This resulted in taking up works indiscriminately and works taken up for investigation and execution were in different corners of the taluks in the district and as a result much irrigation time was lost and many a work needing repairs urgently, did not receive prompt attention.

14. With a view to ensuring systematic inspection, the Government ordered that "Circle System" should be introduced in those districts where in the opinion of the Collector the conditions were favourable (Appendix XII).

Under the Circle System of inspection, each taluk is divided into a number of convenient circles compact and continuous to each other, the tanks in these circles are attended to by rotation. This system has the advantage that the area to be gone over is limited and defined and the number of tanks to be inspected is fixed. While investigation and preparation of estimates are going on in one Circle, the execution will be going on in the second.

15. In the Circle System in Madurai district it was noticed that there are 4,326 tanks under the Revenue Department, which are maintained by two irrigation supervisors assisted by seventeen overseers; each overseer has a section comprising six circles and each circle normally contains 30 to 40 tanks except in Dindigul taluk which has as many as 60 tanks. The inspection of these tanks is carried out in rotation so that each tank has its turn for repairs, once in six years.

16. The Government revised their orders in 1943 and in the interest of food production, suspended the Circle System of repairs by giving special preference to those works which increased the acreage under the food crop. Subsequently, the Government re-examined the working system and decided that as the tanks would receive attention only once in four or five years under the Circle System, it was necessary to make the inspection of all irrigation sources more frequent. With this object in view, the minor irrigation overseer was required to inspect every minor irrigation work in the district once a year and more often if possible and to keep an accurate record of the conditions of each work as ascertained by these inspections. Repairs necessitated

by unforeseen occurrences like floods, continued to be attended to immediately as before.

17. The above orders were, however, not strictly followed and the Circle System was not introduced in many districts because:

- (i) it was at the discretion of the Collector to introduce the system wherever the conditions were favourable;
- (ii) due to adverse climatic conditions a large number of sources needed repairs with the result that the Circle System could not be followed strictly;
- (iii) the Circle System could be suspended where necessary in preference to tanks which would increase acreage under food crops; and
- (iv) the inspection of all minor irrigation sources was required to be carried out every year.

The Board of Revenue, therefore, decided that the Circle System ordered in 1936 should be enforced and followed rigidly by all the District Collectors. The number of Circles to be formed may be such that the programme of inspection and maintenance may be covered in a period of 6 or 7 years.

18. In Coimbatore District though the number of tanks was small, the Circle system was ordered to be introduced in order to ensure systematic inspection. While in Ramnad District where all the tanks are zamin and are not only in a dilapidated condition but most of them have suffered damages extensively, the orders are as follows:—

“The Collector of Ramanathapuram reports that the conditions now prevailing in his district are not favourable for introducing the Circle System immediately as the district consists mainly of estate areas and most of the tanks in these areas have not been repaired for many years prior to the taking over of the estates by Government, that many tanks have also breached due to cyclone and floods in 1955 and that priority has to be given with reference to the urgency of the particular work. He states that the Circle system can be introduced only after bringing all the tanks in estate areas in good condition by which time the settlement work will also be completed and ryotwari system will be introduced. The Collector is informed that in respect of the sources in Ex-estate areas which have been neglected for several years prior to taking over of the estates special accelerated circle should be worked out so that the initial round of repairs may be finished in a shorter period and after the initial round is over, they may be arranged in the ordinary circle scheme in the district. As and when the estate works are repaired, the circle should be expanded and these works should be fitted into them. When works are carried out by the Public Works Department or taken up under the Special Minor Irrigation Programme, they should be deleted from the circle of the corresponding year.”

The Team was impressed with the systematic procedure adopted by the State in selecting tanks for repairs and restoration. The Team, however, feels that tanks that have been taken over from old zamindars require special treatment. A large majority of ex-Zamin tanks have been neglected for many years. It is suggested that all such tanks are surveyed on an emergency basis and their maintenance brought in line with the rest of the tanks in the State.

19. During the inspection of few tanks restored in 1953 and 1954 in Tirupathur Taluk of Ramnad District it was observed that the bund was lower than the T. B.L. by more than a foot in all the tanks and the top width of the bund was hardly more than a foot almost tending to a knife-edge. It is necessary to provide standardised top widths* not less than about 8'. The rules provide for systematic inspection of irrigation sources but repairs to tanks are done at intervals of six years or more according to the Circle System unless emergent repairs are necessary. Six years is a long period and a tank during this period is considerably deteriorated. The pitching may be dislodged at a number of places and the sluice and surplus works need repairs. The earth on the top of the bund and the slopes would have been washed down and the profile would thus be reduced below the standards at times even endangering the safety of the bund.

20. The Team, therefore, recommends the urgent need of maintenance of tanks on the same basis as the maintenance of Government buildings or roads which are brought regularly under annual repairs. This work may be entrusted to Village Panchayats or Irrigation Panchayats where they exist, so that small damages caused to bunds during Monsoons or otherwise may be made good immediately.

21. During repair and restoration of tanks, the State staff seemed to be concentrating mainly on the earth embankments and the repair of sluices. Equally important work of feeder channels does not seem to have got the same attention. On all tanks that depend upon river supply for their filling, it is very important that their feeder channels are kept in proper shape. Attention in this direction would improve the utility of river-fed tanks.

22. For maximum use of water stored in these tanks, the State will be well-advised to examine the possibility of laying out water-courses in the ayacut of the tanks. Present mode of irrigation by passing water from one field to another is extremely wasteful. Construction of water channels locally called "Bodhies" has a good chance of increasing the irrigation performance on the tank.

*For detailed recommendation please see Chapter IV of Minor Irrigation Team's Report on Mysore State—September 1959.

CHAPTER III

FEATURES OF DESIGN AND CONSTRUCTION

1. Design Aspects

1.1. Case studies of 11 tanks selected at random showed that the water-side slope was $1\frac{1}{2} : 1$ in 7 cases and 2:1 in 4 cases; whereas the rear-side slopes were $1\frac{1}{2} : 1$ in 4 cases and 2:1 in seven cases. It is desirable that the water-side slopes are kept not steeper than 2:1 to ensure better stability of bank as well as the stone revetments. So far as the rear-side is concerned, a slope of $1\frac{1}{2} : 1$ may be adequate for heights upto 20' or so.

1.2. The top widths of banks are generally 3' to 4' and in 2 cases they exceed 10'. It is recommended that the top widths are standardised in relation to the bund heights, limiting the minimum width to about 8'.

1.3. From Statement I it is noticed that there have been 9 cases of breach in the 11 tanks studied, eight cases are due to regular overtopping and the 9th one is also practically due to the same reason though it is categorised as due to bund erosion. From Statement II it is clear that the waste-weir capacities provided are invariably on the low side in comparison to probably high floods expected as per Inglis flood formula. This seems to be the main reason for overtopping and breach of tanks. Therefore it is recommended that spillway-design-practices are thoroughly reviewed and steps taken to provide, on all new tanks, adequate waste-weir capacities computed from detailed storm studies, adopting unit hydrograph method.

2. Restoration and Repair Works :

2.1. The designs for the works which are being undertaken under the Special Scheme comprising restoration of tanks and masonry works across the streams etc., are simple in nature. These designs have all been standardised for a number of years and their adoption has proved to be satisfactory and does not need any further revision. Detailed instructions for the execution of various items of work have been laid down and are being adopted for quite a long time. For instance, the various steps to be taken in restoring an old bund to the standard level, filling up of a breach, setting up of revetment, construction of a sluice or masonry weir have been described in detail and the specifications are drawn up and standardised.

2.2. A special reference has to be made to 'Earth work to the bund'. It has been noticed from the estimates for restoration of a tank that Specification No 20-A prescribes only for filling in breaches and sides of sluice barrels or tunnels. This lays down detailed instructions for earth work and includes consolidation with tamping. In regard to other portions of the bund which would have deteriorated on account of want of maintenance the top of the bund being lower by a foot or two below the standard level, the slopes also being scoured badly with deep gullies etc., Specification 20-B is adopted ("Earth work and rough Banking"). The Note attached to Specification 20-B states "this specification will apply to cases of excavation where breaking clods, ramming and sectioning to the spoil bank are not required such as may occur

* Actually in Madras State the Ryve's formula ($Q=675A^{\frac{3}{2}}$) was evolved. But as it was found that this formula fell too short of actual floods since a co-efficient as high as 2700 has been observed in Madras State (vide page 33 of 'Estimation of Design Flood' issued by Central Water & Power Commission), for the sake of comparison here the Inglis formula has been adopted.

in some drain excavation etc.” Evidently this refers to formation of a spoil bank on the side of an excavated drain. Clause 3 of Specification reads as follows:

“spoils from the pits shall be deposited on bank to such sections as shown on relevant plans etc. Ramming, breaking clods and smooth surface sectioning shall not be necessary but a spoil bank with a neat, straight toe, even slopes and even top surface shall be formed as the depositing proceeds”.

During the visits of the Team to certain tanks treated in this manner, it was found that the earth on top of the bund had been washed down in the rains and gullies and scours formed on the slopes also. The Team is in favour of adoption of Specification 20-A for the entire length of the bund as the Specification will meet the requirements of the earthen bunds for storage works. Although periodical repairs are carried out once in six years, the cost of maintenance would generally be minimised to a certain extent, if the higher standard Specification is adhered to. On inspection of a few old estimates of restoration of works, it was noticed that the item of earth work does include consolidation and conforms to Specification 20-A.

2.3. The utility of gravel has been recognised for providing a casing to the exposed earth surfaces *i.e.* top and slopes of bund. Wherever this material is readily available it should be used as indicated in the Specification 20-B (Madras Detailed Standard Specification). Turfing is provided only for the front slope of earthen bunds in the breached section. It is essential that in the other portion of the bunds also similar work may be provided for. Specification No. 22 ‘Turfing’ indicates that this is an essential element in an earthen bund. It is noticed that stone pitching is provided in breached sections or in certain sections of the bund where the wave action is intensive. It is, therefore, necessary that the whole bund may be treated instead of confining this work to short lengths.

2.4. The completion of earthwork with the few modifications suggested above would result in bunds being retained in a satisfactory condition, reduce the cost of maintenance and also minimise the risk of their being washed away by abnormal heavy rainfall. With the adoption of all these additional works, the cost would increase and the present limits specified namely Rs. 200 per acre or Rs. 1,500 per ton of extra food grain may have to be suitably enhanced.

3. Agencies of Construction

3.1. The usual method adopted in the Public Works Department of calling for tenders and letting out works on contract is generally the practice. But as the works under Special Minor Irrigation Programme are of small magnitude and far flung from one another and in the interior, it is not possible to attract contractors to work on competitive rates. Further with the rural awakening following the introduction of the Community Development Blocks and National Extension Services Programmes, the villagers generally resent an outside agency coming to take up works in their villages. To surmount the above difficulties, works are now entrusted also to the villagers at estimated rates. They nominate a representative to undertake the work on their behalf and execute it either at estimated rates or at current schedule of rates as the case may be. The routine of calling for tenders, depositing earnest money and other procedural details are avoided in this system. The

nominated spokesman is, however, expected to sign the agreement as in the case of a work taken on tender. As the villagers are interested more in the safety of their irrigation source than in the profits, the quality of work executed can be expected to be satisfactory. However, certain delays have been experienced by the adoption of this system. These delays could be avoided and the progress improved by offering incentives in the shape of financial aid as advances and prompt payments for the works executed.

3.2. *Wherever, response from the villagers to take up these works is not forthcoming, the feasibility of grouping the repairable tanks within a reasonable distance from one another and giving out contracts costing Rs. 50,000 or more to contracting firms, having finance and equipment and command of labour, may be considered.

*Please see para 3, Chapter V—Report on Minor Irrigation Works in Mysore State—September 1959.

STATEMENT I
Study of Bund details

Sl. No.	Name of Tank	Maximum height of bund	Top width of bund	Slopes of Bund		Number of breaches due to			Unrecorded reasons
				Front	Rear	Over-topping	Piping	Erosion of bund	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
1.	Kilikodi	11'-3"	4'-0"	2 : 1	2 : 1	2	—	—	—
2.	Burdur	10'-6"	4'-0"	2 : 1	2 : 1	2	—	—	—
3.	Eraiyur Devaneri	13'-9"	4'-0"	1½ : 1	2 : 1	—	—	—	—
4.	Thachambadi Peria Eri	20'-6½"	3'to 5'	1½ : 1	1½ : 1	—	—	—	—
5.	Thodaneri	16'-0"	4'-0"	1½ : 1	1½ : 1	—	—	—	—
6.	Paravai	16'-0"	6'-0"	1½ : 1	1½ : 1	—	—	1	—
7.	Emaneswaram	11'-0"	5'-0"	2 : 1	2 : 1	1	—	—	—
8.	Sengulam	4'-6"	13'-2"	1½ : 1	2 : 1	—	—	—	—
9.	Pillayarkulam	15'-7½"	6'-0"	1½ : 1	..1½ : 1	—	—	—	—
10.	Athangarai—Cheriakulam	4'-0"	11'-6"	1½ : 1	2 : 1	2	—	—	—
11.	Nambipuram	24'-0"	4'-0"	1½ : 1	2 : 1	1	—	—	—
TOTAL						8	—	1	—

STATEMENT II

Study of waste—weir capacities

Sl. No.	Name of Tank	Catchment area = A (Square miles)	Length of waste weir = L	Maximum Flood as per Inglis = Q* (Cusecs)	Height of flood lift = $\left[\frac{Q}{3.1 \times L} \right]^{\frac{2}{3}}$ ‡	Free board from crest of W.W.	Free board above maximum flood level (7) — (6)	† Increase in Height of bund required to give 3' free board
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1.	Killikodi	0.65	61'—0"	2106	4.99'	4'—6"	— 0.49'	3.49'
2.	Budur	2.00	177'—0"	5714	4.77'	4'—6"	— 0.27'	3.27'
3.	Erattur Devaneri	4.80	226'—0"	11313	6.39'	5'—0"	— 1.39'	4.39'
4.	Thachambadi Peria Eri	4.80	101'—0"	11313	10.92'	4'—0"	— 6.92'	9.92'
5.	Thodaneri	35.50	178'—0"	39570	17.26'	4'—0"	— 13.26'	16.26'
6.	Paravai	20.50	398'—6"	28989	6.51'	4'—6"	— 1.01'	4.01'
7.	Emaneswaram	7.50	146'—0"	15487	10.54'	4'—0"	— 6.54'	9.54'
8.	Sengulam	4.30	187'—0"	10451	6.94'	3'—0"	— 3.94'	6.94'
9.	Pillayarkulam	5.38	163'—6"	12307	8.40'	3'—0"	— 5.40'	8.40'
10.	Athangarai—Cheriakulam	2.50	45'—0"	6863	13.43'	5'—0"	— 8.43'	11.43'
11.	Nambipuram	8.53	74'—0"	16867	10.69'	5'—0"	— 5.69'	8.69'

*Q = 7000A $\sqrt{A+4}$

† Alternatively, waste—weir length could be increased.

CHAPTER IV

DESILTING—CUM—RECLAMATION SCHEME

It is well known that many tanks in the State have lost their original capacities on account of silting which is due to natural causes. Besides, encroachment into the tank bed and unauthorised cultivation has also contributed largely to the cause of silting. The new industrial townships and expansion of towns and cities to house the increasing population have led to the systematic denudation of vegetation in the catchment with the result that soil erosion in the catchment is getting heavier and the run off now carries a larger quantity of silt than before. Silting of a tank is a gradual and continuous process wherein the eroded materials from the catchment flowing with the run off gets deposited in the tank bed where the velocity is checked by the presence of the tank bund. The coarser materials get deposited at the foreshore, while the finer materials in the deep bed of the tank. The quantity and nature of silt depends on

- (i) the nature of catchment;
- (ii) slope of catchment;
- (iii) the intensity of rainfall and
- (iv) the capacity of the tank compared to the catchment.

It is expected that in due course of time the deposit of silt in the tank would assume such a high proportion that the tanks would lose their capacity to an extent of 50% to 60%. The report of Irrigation Department who have examined 125 tanks in the State, shows that thirteen tanks had silted more than 50%, fifty one tanks between 25 and 50%, fifty tanks between 10 and 25% and eight tanks less than 10% (Appendix XIII). It is therefore, evident that on the average the silting has been of the order of 25%. This clearly shows that the State is losing 25% of the area under irrigation in the case of tanks as a result of their reduced capacities. The Team, therefore, emphasises the need for urgent restoration of tanks to their original capacity and revitalise them so that the original irrigated area under the tanks is at least sustained if not increased.

2. The old practice of restoring the tanks to their original capacity, by raising the waste—weirs, involves the submersion of foreshore lands the cost of which has gone up so high in recent years and makes the project unremunerative. The capacity can also be restored by removing the silt from the tank. In the earlier days the cultivators in the ayacut used to remove the silt every year and use it on their fields on account of its manurial value. This used to reduce the silt to some extent. In recent times this practice has been completely given up. Removal of silt is prohibitively costly; it costs as much as Rs.20,000 to Rs.25,000 to secure an additional one M.c. ft. of capacity by this process. Further, the measures do not give any tangible solution to the problem of silting.

However, with a judicious combination of both these methods, i.e., (i) raising the weir and (ii) desilting the bed, it is possible to regain the lost capacity of the tank to some extent and also reduce the submergence. Such a solution is already tried under the Desilting-cum-Reclamation Scheme which has been initiated by the P.W.D. of the State on an experimental basis (Appendix XIV).

In most of the cases a portion of the bed of the tank is under occupation and also forms generally the ayacut of an upper tank. This area would suffer from water-logging when the tank is full and being at the tail end may not get water for irrigation during the ripening period of the crop. This scheme referred to above is to excavate the silt from the tank bed and deposit the silt on the foreshore land mentioned above and also on the slopes and top of the tank bund. A dowel bank is put on the tank side land at a contour lower than the F.T.L. to such a height that would permit water to stand about 6 inches on the reclaimed land when the water in the tank is at F.T.L. This water helps in the early operations and at the same time gets drained off as soon as the water in the tank is used for irrigation lower down. The valleys bringing run off into the tank are properly canalised, the sides and beds being protected with stone pitching. The sides are raised above F.T.L. for some distance. The weir is also raised from a few inches to 2 ft. to obtain part of the lost capacity.

3. Suitable earth not being available near the bund long leads are necessary. Earthmoving machinery has, therefore, to be employed to desilt the bed and deposit the earth on the foreshore land to a depth of a foot and on the tank bund-on the top and slopes as well. The original top widths are 4 ft. to 6 ft. in most of the tanks. They are widened from 10 ft. to 12 feet so as to enable the machinery to pass over them. Ramps are provided at suitable distances so that the machinery can by means of these be moved to the top, deposit the earth on the bund and return. On the works visited by the Team, tractor-scraper unit moving on pneumatic wheels were used. For levelling the earth work dumped by scrapers a bull dozer is utilised. The number of such units is fixed in accordance with the quantity of work to be done.

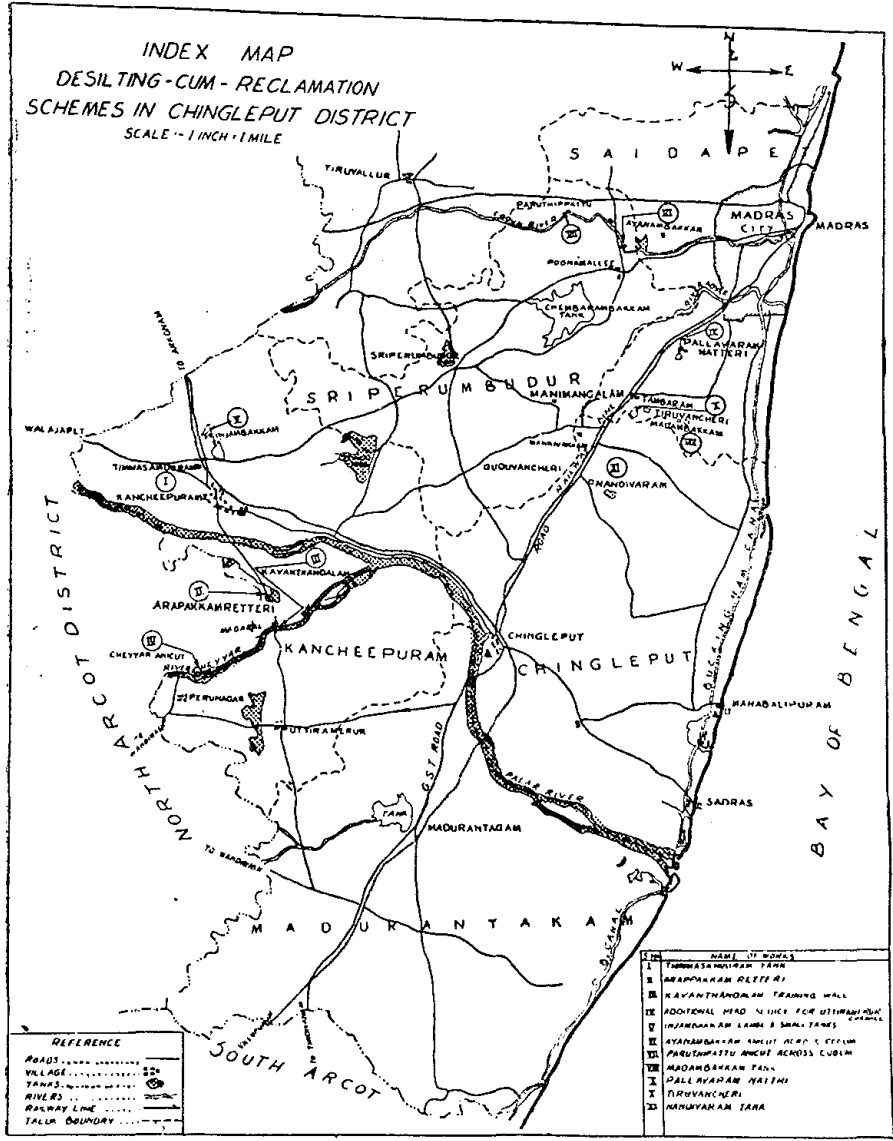
4. The State Government has completed some schemes (Appendix XIV) in Chingleput District (map on the opposite page) and has thirty four under execution in different districts of the State. Districtwise distribution is given below:—

Name of District	No. of works	Total cost	Gap to be bridged	Reclaim- ed area	Total	Yield in tons
Chingleput	33	6,51,050	432*	328*	760*	364*
North Arcot	2	1,90,000	129	34	163	70
South Arcot	4	1,04,000	..	783	783	113
Coimbatore	1	17,000	69	..	69	35
Kanyakumari	9	1,99,900	..	2189	2189	727
TOTAL	49					

All the above schemes are included in the Second Plan. There is a total provision of 50 lakhs for this scheme of which a sum of Rs.6.60 lakhs was spent in 56-57 mainly for the purchase of earthmoving machinery and a provision of Rs. 2 lakhs was made for works in the budget. Provision has been made to carry out works to the tune of Rs. 10 lakhs during each of the subsequent years.

*For completed 13 Schemes only.

INDEX MAP
DESILTING-CUM-RECLAMATION
SCHEMES IN CHINGLEPUT DISTRICT
SCALE: 1 INCH = 1 MILE



REFERENCE

ROADS	.....
VILLAGE	.....
TANKS	.....
RIVERS	.....
RAILWAY LINE	.....
TALUK BOUNDARY	.....

NAME OF WORKS

1	TANNIVASAMUDIRAM TANK
2	ARAPAKKAM RLETTERI
3	KAVANTHANGALAM TRAINING WALL
4	ADDITIONAL HEAD NUICE FOR UTHIRANGALAM
5	THIRUPURAM SRI LAKSHMI TANKS
6	KAVANTHANGALAM SINGH TANKS
7	PARUPPATTU ANCHI ACROSS CUBIN
8	MADAKKAM TANK
9	PALLAVARAM NAITHI
10	TIRUVANCHERI
11	MANOVARAM TANK

The staff employed for the investigation and preparation of estimates of these Schemes consists of one Sub Divisional Officer with an adequate number of supervisors and overseers. A special Division to carry out the works under this programme has recently been formed with five sub-divisions and adequate subordinate staff.

5. Certain general principles have been laid down for the selection of tanks and preparation of projects under this scheme. They are:—

- (i) Purely rainfed tanks or tanks receiving only little supply from supply channels should be selected;
- (ii) Raising the F.T.L. of a tank should involve as little acquisition as possible in rear of burds and should not also affect lower irrigation;
- (iii) The foreshore lands should be mostly peramboke* and that too cultivable so that they can be assigned for cultivation immediately after reclamation;
- (iv) The selection of tanks should start from the terminal tank of each group.

The Superintending Engineers were informed that all estimates under Desilting-cum-Reclamation schemes should be sent up to the Chief Engineer with the usual proforma relating to G.M.F. and financial aspects for sanction irrespective of their costs, whether they are within the powers of Executive Engineers or Superintending Engineers.

6. The advantages claimed in this Scheme are :—

- (i) The scheme is most economical as it would eliminate acquisition of costly lands and lends easily to the adoption of execution by machinery whereby the project is completed in a short time;
- (ii) Vast areas which are now waterlogged on the margin are reclaimed and utilised for irrigation and the insanitary conditions on account of the waterlogging are also prevented;
- (iii) Spring heads in the tank bed which are now buried would get exposed;
- (iv) Foreshore lands form effective barriers against free flow of silt-borne water and consequently increase the life of the tank;
- (v) The scheme pays for itself by sale of lands reclaimed on the foreshore.
- ***(vi)* It would also reduce losses due to evaporation as the area of water-spread gets reduced.

The relative merits of this scheme depend on the configuration of the land and situation of the tanks. Care has to be taken to see that the existing rights are not interfered with and that there is surplus water available for the storage.

7. The Team has inspected a number of works that have been completed so far. The general features observed in all works are given below:—

- (i) Land reclaimed is invariably in 'Patta lands'—no land coming under "Peramboke";

*Government lands.

**Please see paras 7 to 12 of Chapter II and Appendices VII and IX—Report on Minor Irrigation Works in Mysore State—September 1959.

- (ii) Except in one case the reclaimed area is the ayacut of an upper tank;
- (iii) Most of the tanks selected for Desilting-cum-Reclamation work are the last in the series or very nearly the last;
- (iv) The foreshore land in every case is flat and therefore Peramboke can be reclaimed without extra cost;
- (v) The dowel banks are 3 ft. wide at the top and about 2 ft. to 3 ft. high with 1:1 side slopes. These are not consolidated or turfed. Separate provision is not made for these in the estimate. These are constructed out of the destilted earth.

It has to be seen after 3 or 4 seasons as to what extent these tanks would stand the effect of rains etc., as in a few cases the top width and the sides have been reduced in sections. A modification of the Scheme is called for in order that the improvements effected are more permanent and lasting. The dowel bank which can be of larger dimensions needs to be consolidated and protected with turfing or even pitching so that they do not get scoured during Monsoons. A portion of reclaimed land on the foreshore side, say 10 to 12 feet, may also be consolidated along with the dowel bank so that the whole acts as a stable bank. This section may be planted with suitable trees. Instead of depositing the earth on both slopes of the tank bund it is preferable to lay it only on the rear side as the earth put on the front slope will gradually get washed off and deposited in the tank bed again, and there is a tendency for the pitching to be dragged down with the earth. The drains leading into the tank must be lined well and raised above the new F.T.L. so that the water will not spill over the reclaimed land.

8. In the few schemes, the Team had the opportunity to visit, the lands reclaimed were Patta lands with the result that the entire cost was borne by the Government apart from the fact that pattadars of the foreshore land were under the impression that they had helped the Government in permitting them to put the earth on their lands although the Government had effected a permanent improvement to their lands. The beds of tanks also comprise some peramboke. If the projects are prepared as to include peramboke such lands would become available for sale. The realisations would certainly reduce the cost of such schemes. In the schemes where Patta lands are involved the beneficiaries can be asked to pay a betterment levy or contribution that may be fixed by the Government according to the rules.

9. It is the view of the Team that the Desilting-cum-Reclamation Scheme* may be implemented to reclaim Peramboke lands under the tanks according to a phased programme and included in the Third Five Year Plan.

*The Minor Irrigation Team has also recommended this scheme for Mysore State.

CHAPTER V

BETTERMENT LEVY AND WATER RATE

An act to provide for the levy of Betterment Contribution on certain lands in the State of Madras was passed on the 4th March 1955 (Appendix XV).

2. The Act entitles the Government to levy a betterment fee from the land holder of any land which is benefited by the construction, expansion or alteration by the Government whether after the commencement of this Act or at any time before such commencement but not earlier than 1st January 1947 of any work (including the installation by them of a pumping set) the cost of which exceeds twenty five thousand rupees.

3. The amount of fee is fixed according to the classification of land made according to the annual increase in the gross produce of each class of land.

4. The betterment fee to be paid is payable in twenty equal instalments. A rebate of 20% is allowed to those who can pay within two years. The contribution is recoverable as arrears of land revenue and the land or any property standing on the land is regarded as security of the contribution.

5. The contribution becomes payable two years after the date of completion of the work. Arrears of instalments of contribution shall bear an interest of 6% per annum and recovered as arrears of land revenue.

6. Examination of the programmes of works under the Special Minor Irrigation Schemes shows that under the heading "cost recoverable" from the ryots" which presumably refers to Betterment Levy, no amount has been shown in respect of any project. Rules under the Act have so far not been framed and the Team recommends an early formulation and implementation thereof.

*N.V. Gadgil,
Leader.*

26th September, 1959.

SUMMARY OF RECOMMENDATIONS

The Team suggests that the Tank Memoirs, including those of the zamin tanks may be brought up-to-date.

2. The Team recommends that spillway-design-practices are thoroughly reviewed and steps taken to provide, on all new tanks, adequate waste-weir capacities computed from detailed storm studies, adopting unit hydrograph method.

3. Further recommendations of the Team are as follows:—

- (i) Replacing the earthen bunds now being put every season across the streams by masonry anicuts with scouring sluices;
- (ii) Providing Regulators for the supply channels;
- (iii) Maintaining the tanks on the same basis as Government buildings or roads which are regularly repaired every year;
- (iv) Entrusting Tank repair work to village Panchayats or Irrigation Panchayats where they exist, so that small damages caused to bunds during Monsoons or otherwise may be made good immediately;
- (v) Adopting Specification No 20-A, for the entire length of bund;
- (vi) Providing Turfing for the earthen bunds in accordance with Specification No. 22.
- (vii) Bringing old zamindari tanks which have been neglected for number of years in line with the rest of tanks in the State;
- (viii) Keeping feeder channels in proper shape in order to improve the utility of river fed tanks.

4. The Team recommends providing regular water courses in the ayacut of the tanks as the present mode of passing water from one field to another is extremely wasteful.

5. With regard to pumps and filter points the Team points out:—

- (i) Desirability of installing filter points inside a bored hole in preference to driving it into position.
- (ii) Necessity to co-ordinate the functions of Revenue and Agriculture Departments.
- (iii) Limiting lift irrigation to places where ample water is available for atleast 200 days in a year so as to avoid over-capitalising which has proved a serious handicap so far.

6. Wherever, response from the Villagers to take up the works on contract is not forthcoming, the Team suggests grouping the repairable tanks within a reasonable distance from one another and giving out contracts costing Rs. 50,000 or more to contracting firms, having finance and equipment and command of labour.

7. The estimates in respect of the works under the Desilting-cum-Reclamation Scheme may be modified so as to reclaim Peramboke lands under the tanks according to a phased programme and included in the Third Five Year Plan.

8. Rules under the Betterment Contribution Act, passed in March 1955, may be formulated and implemented without further delay.

APPENDICES

- I Terms of Reference—Minor Irrigation Team.
- II Minutes of the meeting with the officials of the Government of Madras.
- III Irrigation Statistics and Case Studies.
- IV Table of Rainfall and Yield per square mile for Taluks in Madras State.
- V Statement of the Channel System from Vaigai River and the Tanks served, with Ayacuts.
- VI Procedure for granting loans to Ryots for the Hire-Purchase of "Filter Points".
- VII Sample Sheet—Descriptive Memoirs.
- VIII Rules Governing Financial Assistance for Food Production Schemes during Second Five Year Plan.
- IX Programme of Works for the Year 1958-59—Food Production Circle—Madras State.
- X Act No. I of 1858—The Madras Compulsory Labour Act, 1858.
- XI Standing Ledger of Minor Irrigation Sources (Adopted under the Circle System).
- XII Resolution on the Introduction of Circle System for Inspection and Maintenance of Minor Irrigation Sources.
- XIII List of Tanks examined for Desilting-cum-Reclamation Scheme.
- XIV Details of Tanks in Chingleput District included in the Desilting-cum-Reclamation Scheme.
- XV Act to provide for the levy of Betterment Contribution on certain Lands in the State of Madras.
- XVI Table showing evaporation losses in inches in Madras State.
- XVII Statement showing Observations and Recommendations of the Minor Irrigation Team alongwith Comments of the Government of Madras and the Ministry of Food and Agriculture, Government of India.

APPENDIX I

No.COPP/(4)/17/58.
GOVERNMENT OF INDIA
PLANNING COMMISSION
(COMMITTEE ON PLAN PROJECTS)

Reserve Bank Building,
Parliament Street,
New Delhi, August 4, 1958.

From

Shri Indarjit Singh,
Joint Secretary, Finance
and Secretary, COPP.

To

The Chief Secretary,
Government of Madras, Madras/Andhra Pradesh, Hyderabad/Mysore,
Bangalore/Kerala, Trivandrum/Punjab, Chandigarh/Uttar Pradesh,
Lucknow.

Subject:—Team for the Study of Minor Irrigation Projects.

Sir,

I am directed to forward a copy of the Terms of Reference of the Minor Irrigation Team set up by the Committee on Plan Projects. The Team will conduct studies in accordance with these Terms of Reference in your State. For U.P. & Punjab only. In order to enable the Secretary of the Team to get in touch with the relevant authorities in the State, it is suggested that a liaison officer may be appointed for this purpose with whom he could maintain contact for such arrangements and facilities as may be necessary for this study.

2. The Composition of the Team will be as follows:—

- | | |
|---|--------------------|
| 1. Shri N.V. Gadgil | Leader |
| 2. Shri M. Narasimhaiya | Member |
| 3. Shri Lal Singh | Member |
| 4. Irrigation Adviser to the Government of India. | Member ex-officio. |
| 5. Shri D.S. Borker | Secretary |

3. The Team has been instructed to associate the local officers with its work. The Leader of the Team will contact the State Government for the name of the official or officials who should be associated with the Team.

Yours, faithfully,
sd/- Indarjit Singh,
Joint Secretary, Finance and
Secretary, COPP.

TERMS OF REFERENCE OF THE MINOR IRRIGATION TEAM

The minor irrigation projects may be divided for study into two parts:—

- Works already in existence.
- Works which are now being constructed.

2. Case studies should be made of a number of projects of each type under the above headings with a view to judging their efficiency having regard to the objectives with which such works were carried out.

3. The following points should be especially borne in mind:—

Existing Projects:

- (i) The present state of repair and maintenance.
- (ii) The system of keeping works in proper maintenance with particular reference to the customary obligations of villagers for keeping such works in a sound condition from year to year, the Team should also examine the extent to which these obligations are enforced, the reasons for the failure to do so and the steps that should be taken to carry out such obligations efficiently.
- (iii) Reasons, if any for non-utilisation of water by cultivators.
- (iv) Improvements necessary to make the projects more efficient either in the matter of better agricultural planning and practices or in respect of engineering works.
- (v) Cost of restoration if the project is in a state of disrepair and whether it has been included in the Plan.

New Projects:

- (i) Methods of selection—procedure and principles on which priorities are based.
- (ii) Flow Chart of the construction Project should be prepared to examine whether any avoidable delay has occurred in its completion.
- (iii) Whether fullest use is made of catchment capacity in preparing designs.
- (iv) Economics of design.
- (v) State of agricultural planning with a view to optimum utilisation of benefits.
- (vi) Institutional arrangements provided for the proper maintenance of new works with special reference to the customary obligation of villagers in this regard.
- (vii) Costs of actual construction compared to estimated cost—the reason for increase, if any, and the care with which the initial estimates were framed.

4. Any other matter which the Team considers necessary to report upon having a bearing on economy and efficiency of such projects.

5. The following information should be gathered by the Team for each State, taken as a whole in regard to existing minor irrigation works:—

- (i) The total area irrigated from them according to Settlement registers.
- (ii) The area actually irrigated from year to year beginning from 1947.
- (iii) The reason for the reduction, if any, in the area irrigated.

6. In addition, the Team will carry out a study of the tubewell schemes of the Punjab and the U.P. with reference to the fact whether optimum use has been made of the facilities available by ensuring scientific crop planning and by improving agricultural practices. The study should be based on an examination of individual tubewells, which may be divided into most successful, successful and least successful varieties for the purposes of study. The Team should also select a few tubewells for which alternative crop planning and practices may be recommended that are being carried out at present in order to make them more successful. The consideration mentioned regarding minor irrigation works in paragraph 3 *mutatis mutandis* be taken into consideration for the study of tubewells also.

APPENDIX II

COMMITTEE ON PLAN PROJECTS (IRRIGATION & POWER TEAM)

Summary record of the proceeding of the meeting with the representatives of the Madras Government held at 1500 hrs. on the 24th July 1958 at Fort St. George, Madras.

Present

1. Shri N. V. Gadgil, Leader, Minor Irrigation Team. (in the Chair)
2. Shri M. A. Manickavellu, Minister for Revenue.
3. Sardar Lal Singh, Member, Minor Irrigation Team.
4. Shri M. Narasimhaiya, Member, Minor Irrigation Team.
5. Shri Mahavir Prasad, Irrigation Adviser, Ministry of Food & Agriculture & Member Minor Irrigation Team.
6. Shri M. V. Subramaniam, I.C.S., Member, Board of Revenue.
7. Shri P. P. I. Vaidyanathan, I.C.S., Secretary, Agriculture & Food Production.
8. Shri U. Ananda Rao, Chief Engineer (Irrigation.)
9. A. Venkatesan, I. A. S., Director of Agriculture.
10. Shri D. S. Borker, Secretary, Minor Irrigation Team.

Initiating the discussions, the Leader, Shri N.V. Gadgil stated that the Minor Irrigation Team has taken up the study of minor irrigation works in Madras State, in their various aspects such as design, construction, progress, achievements of food production targets etc. After the study, the Team would discuss its findings with the State authorities so as to facilitate the implementation immediately of such recommendations as are agreed to by the Madras Government.

2. Shri Vaidyanathan explained briefly the work that had been turned out in the State and what was proposed to be done in the future. He stated that the extent of the work and the outlay thereon were definitely limited due to shortage of technical personnel.

3. Shri Ananda Rao pointed out the various types of works that come under this category and also the procedure adopted for the maintenance of tanks in the State. He added that periodical inspections are undertaken once in five years and the expenditure on works executed, was being met from the revenues without any liability to the beneficiaries at present. He also pointed out that filter points, for which there has been very great demand from

the ryots have been installed; restoration works have been undertaken particularly in the Zamin areas where the works were reported to have been badly neglected for quite a long time, and earthen structures being put across the streams every year for diversion of water into the channel for irrigation substituted by masonry works. He emphasised that all this helped to bring additional areas of lands under irrigation. He further explained how the Desilting-cum-Reclamation Scheme initiated by the P.W.D. of the State on an experimental basis, is expected to give promising results. He, therefore, requested the Members of the Team to visit the works of such type under execution.

4. In conclusion the Leader directed the Members of the Team to have detailed discussions with Chief Engineer and concerned officers with regard to the desirability of securing greater interest with respect to minor irrigation thus bringing greater area under cultivation, and gave his approval to the programme of visit to the districts of Coimbatore, Ramnad and Madura.

APPENDIX III

IRRIGATION STATISTICS AND CASE STUDIES

Development of irrigation under the various sources in the reorganised State of Madras for the period of nine years from 1949/50 to 1957/58 is detailed below:—

Year	Government canals	Private canals	Tanks	Wells	Other sources	Total
1	2	3	4	5	6	7
	Acs.	Acs.	Acs.	Acs.	Acs.	Acs.
1949-50	19,37,000	33,000	16,89,000	11,10,000	2,47,000	50,16,000
1950-51	19,43,000	4,000	13,95,000	10,52,000	1,89,000	45,83,000
1951-52	19,46,000	16,000	16,16,000	12,31,000	1,28,000	49,37,000
1952-53	17,84,000	5,000	15,74,000	10,55,000	1,29,000	45,47,000
1953-54	18,77,000	4,000	20,57,000	13,01,000	1,53,000	53,92,000
1954-55	19,25,000	3,000	21,73,000	11,23,000	1,37,000	53,61,000
1955-56	19,54,000	(a)	19,99,000	12,47,000	1,06,000	53,06,000
1956-57	19,95,000	2,000	21,05,000	12,36,000	89,000	55,17,000
1957-58	20,50,000	2,000	22,00,000	12,33,000	86,000	55,71,000

(a) Below 500 acres.

From the above statement it is seen that there has been a continuous and progressive increase in the irrigated area under the three main sources of irrigation—the Government canals, tanks and wells.

The total increase under all the sources during the nine years is 5,50,000 acres which is about 11.1% over the total irrigated area in the year 1949-50. The increase under tanks alone is 5,11,000 acres.

CASE STUDIES OF PRESENT CONDITIONS OF ELEVEN IRRIGATION TANKS SELECTED AT RANDOM IN MADRAS STATE.

1. Kilikodi Tank, Ponneri Taluk, Chingleput Distt.

No. 1 and No. 3 sluices from left flank require repairs. Last year, as the barrels were silted up water could not flow through. This caused pressure on the bund nearby and it breached. This tank has been selected for Desilting-cum-Reclamation Programme.

2. Buddur Tank, Ponneri Taluk, Chingleput Distt.

As the bund is not to standards and is eroded near No. 3 sluice, it has to be improved. Sluices No. 1 and No. 3 from left flank are broken and barrel of

No. 3 is leaky. The Public Works Department are preparing estimate of cost for repairs. The inlet channel at the right flank is heavily silted up for over a furlong, and needs to be excavated. This work falls under Kudi Marathu (maintenance by land holders). Owing to lack of co-operation among villagers, in terms of manual labour, etc. in kind, this has not so far been done. As the Public Works Department has taken up this tank for repairs, the Desilting-cum-Reclamation Scheme has not been introduced here due to audit objection that there cannot be more than one estimate for the same tank at the same time.

3. *Eriyur Devaneri, Sriperumbudur Taluk, Chingleput Distt.*

Surpluses from seven tanks above flow into this tank which is rainfed. After the Government took over the tank from estate owners in 1952 under the Zamindari Abolition Act bunds were built. The bund is now weak for about 1,000 feet on both sides of sluice No. 1 from left flank. The progress of work of strengthening the bund is interrupted by rival agencies of work. The barrel of sluice No. 1 requires lengthening as the bund is being strengthened. Otherwise the sill space in the cistern will be clogged up by earth falling from the bund.

4. *Thachambadi Tank, Polur Taluk, North Arcot Distt.*

Four tanks above surplus into Thachambadi tank. This is a Minor Irrigation Tank maintained by the District Collector as distinct from those maintained by the Public Works Department. The inlet channel is silted up. Of the three sluices one requires petty repairs. Except for the top width of 2' to 3' which needs broadening, the bund is to standards. There are palmyrah trees on the tank bund. On the front slope of the bund there are slight erosions.

5. *Thodeneri Tank, Samayanallur Taluk, Madurai Distt.*

The bunds of the tank are to standards, bushes and trees are growing thereon. There have been no breaches in recent times. Sluices are in good condition. The tank is fed by Periyar Main Canal through Naval Odia (Naval stream).

6. *Paravai Tank, Madurai Taluk, Mudurai Distt.*

The tank is split in two by the railway track that runs through. Revetments on the bund require repacking. Packing near waste weir is in good condition. There are rat holes on the bund near the waste-weir. On both sides the bund is eroded due to rains. On the both sides of the railway track the bund is below standards. Behind sluice No. 2 the bund is eroded. Tamarind trees grow on the bund.

7. *Emaneswaram Tank, Paramakudy Taluk, Ramanathapuram Distt.*

Emaneswaram tank is fed by a supply channel from the nearby Vaigai River. There is no head sluice for the supply channel. Remnants of masonry work are observed at the head but no record about it is available. Water impounded by an anicut across Vaigai 85 Miles upstream also is available through this channel. The tank was taken over from the Ramand Zamin under the Zamindari Abolition Act. In 1955 the tank breached due to overtopping. It was repaired at a cost of Rs. 42,400. It is remarkable that the affected portion of the bund is revetted with masonry work and cement plastering. This plastering is peeling off in places. Revetment with granite or rock is costly as there are no hills around. The top width of the bund is supra standard at 5ft. at places where reventments are provided. In some other places it

is slightly less than 4 ft. The height is supra standard. There is vegetation on the bund. Alongwith the waste-weir there is a regulator with seven vents, at the right flank. The tank gets $2\frac{1}{2}$ fillings in a year.

8. *Sengulam Tank, Srivilliputtur Taluk, Ramanathapuram Distt.*

The bund of Sengulam is not upto standards. It requires revetment in some places. In recent years no de-silting has been done. An estimate for Rs. 1,00,000 for repairs to this tank has been prepared. The estimate includes cost of de-silting and providing revetments at vulnerable points in the bund. Forestry cultivation is negligible.

9. *Periyakulam Tank, Srivilliputtur Taluk, Ramanathapuram Distt.*

This is an old tank. The bund is in a fair condition. No. 1 sluice requires reconstruction of tower. The other sluice is wing type and is in good condition. No de-silting has been done in recent years. The tank is fed by drainage from its free basin, by surpluses from 3 upper tanks and by a supply channel from the right bank of Kaya Kudiyar River. Besides a masonry weir and calingulah of a combined length of $72\frac{1}{2}$ feet at left flank over a weir of 24 feet, a loose stone calingulah 67 ft. long is also provided at right flank to let surpluses flow out.

10. *Athangarai-Cheriakulam Koilpatty Taluk, Tirunelveli Distt.*

The tank is fed by a channel from the nearby Uppu Odai (Uppu Stream) and surpluses into the neighbouring Periyakulam (Bigger Tank). The left flank of the bund and the right flank of Periyakulam meet obliquely on the inside. As the water from the feeder channel courses its way into the second tank it has to run around. Where it hits the bund, during floods, it breaches the Cheriakulam. A sluice at this spot connecting the two tanks is necessary. The tank bed abounds with babul trees. These are auctioned out for Rs. 18,000 in the current year. The trees grow on the bunds also. Proposals are under consideration to construct a masonry dam 100 feet long across the Uppu Odai to head on water into the Cheriakulam tank. This will help easier and larger flow of surpluses into Periyakulam tank and Velathukulam tank. A dam now in existence down stream to feed Velathukulam tank is not useful. Estimate of work for desilting is as follows:-

- (i) Desilting- 3,50,000 cft. of earth, excavating first yard and depositing on bank for 1 yard high (hard clay);
- (ii) Removing silted and other soils-3,10,000 cft. of earth.
- (iii) Hard gravelling soil-50,000 cft. of earth.

11. *Nambipuram Tank, Koilpatty Taluk, Tirunelveli Distt.*

The low portion of the bund near the surplus scoured and overtopped in 1956-57. The bund was repaired at a cost of Rs. 2,700 in 1957-58. There is revetment in bund for 1,350 ft. Palmyrah trees grow on the bund. There are six sluices with plug shutter arrangements. These require minor masonry repairs. The tank is fed by a feeder channel from Vaipar River. The tank is silted upto about 6 feet. The average depth of water now is 9 ft. An estimate for Rs. 17,000 has been prepared for repairs to the bund and the sluices.

APPENDIX IV

*Table showing the total Monsoon Rainfall and Corresponding Yield Per Square Mile of Catchment Treating the Catchment either as Good or Average as the case may be.

	Total Monsoon rainfall in inches								Yield of run off from catchment per square mile in million cubic feet	
									Good catchment	Average catchment
1	0.002	0.001
2	0.009	0.006
3	0.028	0.021
4	0.065	0.048
5	0.116	0.087
6	0.209	0.156
7	0.341	0.255
8	0.520	0.390
9	0.732	0.549
10	0.999	0.749
11	1.329	0.996
12	1.728	1.296
13	2.174	1.630
14	2.699	2.024
15	3.276	2.457
16	3.903	2.927
17	4.581	3.435
18	5.353	4.014
19	6.135	4.601
20	6.970	5.227
21	7.885	5.891
22	8.842	6.631
23	9.832	7.374
24	10.873	8.154
25	11.964	8.973

*Chief Engineer (Irrigation), Madras, D.O. letter No. 4327/58A-41, dated the 12th September, 1959, to the Secretary, Minor Irrigation Team.

APPENDIX IV—*contd*

(1)	(2)	(3)
26	13·168	9·876
27	14·364	10·773
28	15·612	11·709
29	16·911	12·683
30	18·330	13·747
31	19·733	14·799
32	21·188	15·891
33	22·693	17·019
34	24·329	18·246
35	25·939	19·454
36	27·600	20·700
37	29·312	21·984
38	31·163	23·372
39	32·980	24·735
40	34·848	26·136
41	36·767	27·575
42	38·835	29·126
43	40·858	30·643
44	42·933	32·199
45	45·058	33·793
46	47·342	35·506
47	49·572	37·179
48	51·854	38·890
49	54·186	40·639
50	56·686	42·514
51	59·123	44·342
52	61·611	46·208
53	64·151	48·113
54	66·866	50·149
55	69·510	52·132
56	72·205	54·153
57	74·951	56·213

APPENDIX IV—contd

(1)	(2)	(3)
58	77·883	58·412
59	80·734	60·550
60	83·635	62·726

*Statement showing the Monsoon Rainfall in all Taluks in Madras State

Name of District	Name of Taluk	Total Rainfall (inches)
MADRAS	Madras	47·24
CHINGLEPUT	Attipet	41·53
	Ponneri	44·15
	Satiavedu	39·88
	Tiruvellur	37·81
	Kanchipuram	39·86
	Sriperumbudur	39·62
	Poonamalle	44·94
	Saidapet	47·88
	Covelong	47·73
	Chingleput	43·75
	Cheyur	46·45
	Madurantagam	43·67
	Uttiramerur	41·23
	Voyalur	41·39
NORTH ARCOT	Vellore	37·14
	Arni	35·37
	Polur	35·00
	Tiruvannamalai	33·20
	Chengam	31·90
	Wandiwash	40·78
	Cheyur	37·29
	Wallajah	35·77
	Arkonam	37·65
	Gudiyatham	31·09
	Tiruppathur	28·87
	Sholinghur	32·16
	Ambur	25·24
	Vaniambadi	24·91
SOUTH ARCOT	Gingee	36·96
	Tindivanam	40·19
	Mercanam	47·50
	Vanur	41·99
	Villupuram	38·64
	Panruti	43·43
	Cuddalore	48·99
	Kurinipadi	46·17
	Porto Novo	51·02
	Chidambaram	50·21
	Mannargudi	43·93
	Srimushnam	37·77
	Tittagudi	34·65
	Vridhachalam	36·62
Kallakurichi	33·60	
Ulundurpet	36·56	
Tirukoyilur	35·68	

*Chief Engineer (Irrigation), Madras, D.O. letter No. 4327/58 A-41, dated the 12th September, 1959, to the Secretary, Minor Irrigation Team.

APPENDIX IV—contd

(1)	(2)	(3)
TANJORE	Shiyali	48.62
	Neidavasal	48.73
	Tranquebar	47.34
	Mayavaram	44.40
	Kumbakonam	35.79
	Papanasam	37.86
	Valangiman	38.01
	Kodavasal	39.66
	Nannilam	40.37
	Tiruvarur	42.52
	Nagapattinam	50.15
	Tiruppundi	50.87
	Vedaraniyam	48.48
	Tiruthuraiyandi	40.64
	Mathupet	37.65
	Mannargudi	39.56
	Nidamangalam	38.77
	Tiruvadi	31.21
	Tirukkattupalli	30.76
	Tanjore	32.14
	Vallam	33.39
	Puttukottai	34.36
	Adiramapattinam	34.44
Kattumaradi	30.54	
Arantangi	29.60	
Grand Anicut	Excluded.	
TIRUCHIRAPALLI	Musiri	25.46
	Turaiyur	25.81
	Uppilippalayam	27.03
	Settikulam	31.52
	Perambalur	32.45
	Ariyalur	32.93
	Jayankondan	37.39
	Lalgudi	27.68
	Tiruchirapalli	26.72
	Kulitali	22.88
	Marungapuri	26.78
	Iluppur	27.79
	Marappara	28.12
	Karur	20.58
	Arayakurichi	18.42
	Thathiengarpet	24.58
PUDDUKOTAI	Pudukottai	32.84
	Alangudi	32.47
	Karambakudi	25.47
	Tirumayam	32.03
	Keeladulai	28.50
	Kolattur	24.40
	Viralimalai	26.80
	Odayalipatti	28.22
	Annavasal	27.91
	Ponnamaravati	30.38
Adankottai	29.66	
MADURAI	Nartham	29.76
	Melur	30.93
	Sholavaram	25.70
	Madurai	27.19
	Peraiyar	25.18
	Tirumangalam	25.55
	Usilampatti	25.33
Uttamapalayam	22.07	

APPENDIX IV—contd.

(1)	(2)	(3)
	Bodinayakanur	19.81
	Periyakulam	20.46
	Nilakottai	21.46
	Dindigul	23.74
	Vesasandur	19.47
	Chatrapatti	26.54
	Palni	20.60
	Kodaikanal	45.59
RAMANATHAPURAM	Theethandathanam	26.62
	Vattanam	26.94
	Tiruvadanai	25.50
	Sivaganga	27.78
	Manamadura	28.48
	Tirupattur	29.06
	Tiruppuvanam	26.44
	Paramakudi	24.23
	Ramanathapuram	26.86
	Pamban	31.14
	Kumudhi	21.26
	Morekulam	21.61
	Kudukulatur	23.80
	Aruppukottai	24.73
	Sattur	19.47
	Watrap	25.35
	Srivilliputur	22.44
	Virudunagar	20.17
	Sivakasi	22.72
TIRUNELVELI	Vilattikulam	19.85
	Arasadi	17.17
	Tuticorin	17.71
	Ottapidaram	19.77
	Koyattur	17.16
	Koilpatti	22.25
	Sankarankoil	18.38
	Sivagiri	26.76
	Kadavanallur	24.83
	Tenkasi	29.68
	Kadayam	29.95
	Ambasamudram	25.26
	Palayamkottai	22.03
	Nanguneri	21.30
	Radhapuram	20.95
	Sathangulam	21.07
	Kulasekarapatinam	20.97
	Kiranur	18.39
	Srivaikundam	19.32
	Tirunelveli	23.60
	Tiruchendur	24.56
SALEM	Thalli	28.00
	Denkrikota	24.88
	Hosur	24.77
	Rayakottai	29.17
	Krishnagiri	26.24
	Uttankarai	28.00
	Harur	27.63
	Dharmapuri	26.16
	Palacodu	26.89
	Pennagarum	25.61
	Omalar	26.81
	Salem	31.73
	Rasipuram	26.65

APPENDIX IV—contd.

(1)	(2)	(3)
	Sankaridrug	25·05
	Tiruchengodu	21·52
	Thamempatti	27·05
	Attur	29·72
	Valappadi	26·35
	Namakkal	22·26
	Paramathi	18·66
	Sendamangalam	24·65
	Yercaud	52·67
COIMBATORE	Talavadi	22·22
	Satyamangalam	21·11
	Gobichettipalayam	22·68
	Bhavani	23·28
	Erode	22·63
	Perundurai	20·06
	Kodumudi	18·28
	Udumalpet	16·92
	Dharapuram	15·30
	Kangayam	18·67
	Avanashi	20·57
	Salur	16·15
	Palladam	15·88
	Coimbatore	17·10
	Periyayanayakanpalayam	20·77
	Mettupalayam	23·21
	Pollachi	24·63
	Annur	18·71
	Tiruppur	19·45
NILGIRIS	Devala	146·00
	Gudalur	80·25
	Naduvattam	89·33
	Ootacamund	40·18
	Kundah Bridge	31·93
	Ketty	38·76
	Coonoor	48·51
	Kotagiri	48·51
	Kodanad	43·91
	Halathi	31·91

30694

APPENDIX V

EXISTING IRRIGATION UNDER VAIGA

List of tanks below Peranai Regulator

Name of Channel and Tank	Registered Ayacut (Acres)
(1)	(2)
GROUP I—MADURAI RAINFALL STATION GROUP	
Left Side (Madurai Taluk)	
Thennur spring channel—Thennu Peria kanmoi	746
Samayanallur spring channel—Arasangulam kanmoi	140
Paravai spring channel—Paravai tank	336
Vaigai spring channel	80
Vandiyur tank supply channel—Vandiyur tank	968
Sattamangalam tank	228
Managiri tank	200
Angadimangalam channel—Angadimangalam tank (Tiruppurvanam taluk).	206
Poovandi channel—	
Poovandi tank	900
Adikarai channel—	
Adikarai big tank }	235
Adikarai small tank }	
Adikarai spring channel—	
Direct ayacut	20
Madappuram channel—	
Madappuram tank	948
Madappuram spring channel—	
Direct ayacut	70
Right Side (Nilakottai Taluk)	
Thenkarai channel—	
Direct ayacut under channel—	
Mannadimangalam tank }	3,428
Tenkarai tank }	
Nilayur channel—	
Melakal Peria kanmoi Madurai taluk	393
Kodimangalam Samikulam	194
Melamathur Peria Kanmoi	164
Sevakkulam	39
Kadikattan kanmoi	32
Kilaneri tank	245
Vadivelkarai tank	354
Pudukulam tank	210
Vilacheri tank	633
Puliankulam tank	41
Thengal tank	929
Samandakulam tank	102
Nilayur tank	2,436
Palamkulam	172
Ariyankulam	84
Sevandikulam	
Melenedungulam	
Kumkattan kanmoi	1,944
Perunkudi kanmoi direct ayacut }	
Madakkulam supply channel—	
Madakkulam tank	2,578

APPENDIX V—contd.

(1)	(2)
Direct ayacut under channel	898
Kilamathur tank supply channel	50
Thubariman tank supply channel—	
Thubariman tank	440
Avaniapuram channel—	
Avaniapuram tank	1,254
Sindamani channel—	
Sindamani tank	481
Anuppanadi channel—	
Anuppanadi large and small tank	996
Panayur channel—	
Panayur tank—Tiruppuvanam Taluk	643
Birankudi village	144
Sayanapuram tank	150
Puliyur tank	60
Sottathatti channel—	
Ayalanur tank	30
Sottathatti tank	70
Kontharai channel—	
Puliyankulam tank	262
Silaiyuman tank (Madurai Taluk)	613
Konthagai tank Tiruppuvanam Taluk	2,456
Manalur channel—	
Manalur tank Tiruppuvanam taluk	642
Manalur spring channel—	
Direct ayacut	40
Tiruppuvanam channel—	
Kalugarkadai tank	401
Thanntankulam	32·70
Tiruppuvanam tank and channel	2,400
Tiruppuvanam spring channel I	100
Tiruppuvanam spring channel II	100
TOTAL	32317·70

GROUP II—SIVAGANGA RAINFALL STATION GROUP

Left side (Tiruppuvanam Taluk)

Kankangudy channel—	
Kankangudy east tank	200
Kankangudy west tank	400
Thappaliendal	37
Manjakkudy tank	133

Sivaganga Taluk

Kanoor channel—	
Kanoor tank	2,658
Papagudy tank	300
Pethanendal channel—	
Petthanendal tank	150
Tirumanendal channel—	
Tirumanendal tank	250
Tirumandendal spring channel (said to be not in existence now)	
Pathinettankottai channel—	
Periakottai tank	612

Manamadurai Taluk

Pathinettankottai tank	200
--------------------------------	-----

APPENDIX V—contd.

(1)	(2)
Sivaganga Taluk	
Valuthanpudukulam	217
Manamadurai Taluk	
Edaikattur channel—	
Edaikattur tank	400
Sirukudi channel—	
Sirukudi tank	372
Sirukudi spring channel	100
Karisalkulam channel—	
Karisalkulam tank	150
Vannakulam channel—	
Vannankulam tank	21
Right Side—Tiruppuvanam Taluk	
Piramanur channel—	
Piramanur tank	1,872
Palayanur common channel—	
Chellapanendal tank	50
Vellianrendal tank	60
Parayankulam tank	100
Kankkanendal tank	180
Alangulam tank	253
Konthikulam tank	600
Muduvandidal tank	150
Maragathavalli tank	104
Kilasankulam	128
Pattupatti tank	200
Thalikulam	150
Anaikulam	164
Melasarikulam	140
Achangulam	104
Palayanur tank	1,130
Ladanendal channel—	
Ladanendal tank	120
Kothangulam channel—	
Papangulam	200
Kothangukulam	289
Marnad channel—	
Thoothai tank	80
Velangulam	150
Pithchappillaiendal	186
Saluppanodai	94
Manamadurai Taluk	
Marnad tank	2,531
Tiruppuvanam Taluk	
Tirupachetty big tank	610
Tirupachetty small tank	572
Malavarayanendal—	
Malavarayanendal tank	200
Malavarayanendal spring channel	—
Sembirayanendal channel—	
Sembirayanendal tank	40
Manamadurai Taluk	
Vagudi kovalavalli common channel—	
Vadathankulam tank	113
Vagudi tank	528

APPENDIX V—contd.

(1)	(2)
Kovalavalli tank	400
Kathukulam channel—	2,147
Kattikulam tank	571
Mullakulam tank	730
Rajagambiram big tank	90
Rajagambiram small tank	90
Anniendal spring channel—	399
Direct ayacut	399
Muthanendal channel—	154
Muthanendal tank	154
Milaganoor channel—	2,500
Milaganoor tank	189
Thuthikulam tank	189
Kurungakottai channel—	260
Kurungakottai tank	260
Kilamelkudi—	551
Kilamelkudi tank	551
Kalpiran common channel—	233
Kalpiran tank	233
Manamadurai channel—	689
Manamadurai tank	689
Pasalai Athanoor common channel—	214
Athanoor tank	214
Kilapasalai tank	600
Melapasalai tank	500
TOTAL	27,525

GROUP III—PARAMAKUDI GROUP

Right Side—Manamadurai Taluk

Parthibanoor common channel—	350
Vannikudy tank	138
Enad Kottai tank	71
Soodiyur tank	71
Parthibanoor tank	1,330
Perungarai common channel—	450
Perungarai tank	450
Pudukudui tank	350
Arungulam tank	641
Vendamadayar common channel—	200
Kamudakudy tank	200
Vengalur tank	296
Covakudy tank	150
Sengankottai tank	73
Madanthai tank	169
Adlental tank	80
Paramakudi Taluk	
Nedungulam tank	80
Nallukurichi tank	50
Mudukulattur Taluk	
Kandakulavan tank	38
Manamadurai Taluk	
Velangudi tank	48

APPENDIX V—contd.

(1)	(2)
Paramakudi Taluk	
Keelakodumalur tank	150
Mudukulathur Taluk	
Pukukulam tank	40
Paramakudi Taluk	
Melakodumalar tank	400
Kothankal channel—	
Kolanpatti tank	200
Tholur tank	200
Vilathur tank	220
Kavanur tank	161.67
Pambur tank	300
Thenpoduvakkudi tank	250
Manamadurai Taluk	
Puduvakudy common channel—	
Puduvakudy tank	200
Paramakudi Taluk	
Andakudy tank	255
Pambuvilundan	276
Venkatankurichi tank	400
Tellichatanallur channel—	
Tellichatanallur tank	150
Kattuparamagudy channel—	
Kattuparamagudi	300
Vendoni channel—	
Vendoni tank	
Ganapathindal	538
Sellur channel—	
Karungulam big tank	100
Karungulam small tank	100
Sellur tank	540
Vagai kulam	50
Kalayur small tank	283
Kalayur big tank	—
Ariyanendal	370
Uruppuli tank	120
Agraharam channel—	
Aharam tank	100
Manjor channel—	
Manjor tank	300
Avarendal channel—	
Avarendal tank	150
Pottasattikudi channel—	
Pottasattikudi tank	150
Kalan channel—	
Karuthanendal tank	50
Pubalathur tank	50
Kilakottai tank	164
Ariyakudy tank	265
Muthuvayal supply channel—	
Muthuvayal tank	338
Bogalur tank	344
Kamankottai channel—	
Kallikottai tank	169
Kamankottai tank	300
Kolanur and Mery channel—	
Meyyanendal tank	50

APPENDIX V—contd.

(1)	(2)
Kollanur tank	100
Minnandi tank supply channel—	161
Minnandi tank	161
Left Side—Elayangudi Taluk	
Nettur channel—	1,976
Nettur tank	100
Pudukottai and Brahmanakurichi channel—	50
Brahmanakurichi tank	528
Pudukottai tank	50
Chittoor or Salaigramam channel—	110
Munaivendri tank	120
Mullaarendal	500
Pethanendal	700
M. Nathambadi	205
Keelayur tank	195
Elayangudy tank	293
Aranayur tank	200
Karunjuthi tank	238
Ariyand puram tank	149
Perimbalai tank	171
Sirupalai tank	104
Puliyur tank	80
Kottaiyur tank	70
Vani tank	50
Nagarkudy tank	
Alimadurai tank	
Anjalnedungulam tank	
Paramakudi Taluk	
Salaigramam tank	2,054
Katchathanallur channel—	90
Katchathanallur tank	90
Elayangudi Taluk	
Emaneswaram channel	2,579
Chattram Valayanendal	47
Upper Nattarkal—	
Konnppanendal	60
Elamanoor tank	60
Valasi tank	300
Chittanendal	100
Paramakudi Taluk	
Kavanur tank	100
Radapuli tank	150
Varavani tank	300
Arambakottai tank	100
Panjanur tank	300
Sirialaki tank	200
Ariyankottai tank	100
Ramanathapuram Taluk	
Rajasingamangalam tanks receiving surplus water of Rajasingamangalam	12,000
Tanks receiving surplus water of Rajasingamangalam	
Kothida	—
Kalakudi	—
Paranoor	—
Alinthikottai	—
Mangalam	—
Kaikudi	—

APPENDIX V—contd.

(1)	(2)
Oduvanendal	—
Ponmani	—
Avarendal	—
Athanur	—
Sholandur	—
Pichankurichi	—
Kavanur	—
Mudithinavayal	—
Karungudi	—
Kalangudi	—
Kothiarkuttai	—
Kothamangalam	—
Thiruppalakudi	—
Valavanoor	—
Kanungulam	—
Mangulam	—
Uranangudi	—
Adandanakkottai	—
Palkulam	—
Melachendanendal	—
Mailloorani	—
Ooravayal	—
Nanganendal	—
Chittornadi	—
Uppoor	—
Vettikulam	—
Paramakudi Taluk	
Vaniyallam tank	200
Marudur tank	150
Thalayadikkottai tank	150
Karadimadakudy tank	300
Vadavaneri tank	150
Pandidivayal tank	250
Elayangudi Taluk	
Keela Ayakudi channel	—
Keela Ayakudi tank	444
Paramakudi Taluk	
Vallam tank supply channel—	—
Vallam tank	200
Nedungurichi channel—	—
Nedungurichi tank	250
Akkiramamesi channel—	—
Akkiramamesi tank	400
Ramanathapuram Taluk	
Chettanendal channel—	—
Chettanendal tank	300
Lower Nattarkal channel—	—
Chadurvedamangalam	400
Koluvoor tank	400
Kiliyoor tank	400
Kodikulam tank	325
Mummadisathan channel—	—
Mummadisathan tank	250
Paramakudi Taluk	
Naghachi channel—	—
Nachachi tank	446
TOTAL	42,252.67

APPENDIX V—contd.

(1)	(2)
GROUP IV — RAMANATHAPURAM RAINFALL STATION GROUP	
Ramanathapuram Taluk	
Thyagavanseri channel—	
Tyagananseri	200
Kolathu channel—	
Kolathu tank	250
Kavanoor channel—	
Kavanoor tank	880
Lower Nattarkal channel—	
Kodaikulam tank (continued from Paramakudi group)	675
Paramakudi Taluk	
Kalari channel (continued from Paramakudi group)	
Melappattan tank	200
Chatram Kodikulam	320
Mudukulathur Taluk	
Malangudi tank	250
Kadambangudi tank	90
Pannaikulam	240
Mallangudi tank	97
T.U. Mangai tank	230
Paramakudi Taluk	
Thiyyanur tank	379
Vairavanur, Seyyalur and Ettivayal channel—	
Vairavanoor tank	250
Ettivayal tank	530
Seyyalur tank	364
Sevan supply channel—	
Sevvur tank	50
Viravanendal tank supply channel—	
Viravanendal tank	278
Ramanathapuram Taluk	
Vaigai tail end	
Ramanathapuram big tank	6,300
Tanks receiving surplus water of Ramanathapuram tank—	
Sakkaraikottai tank	—
Palangulam	—
Sirukulam	—
Purandi	—
Pulathikulam	—
Peranoor	—
Apakudi	—
Amnakudi	—
Idaihangai	—
Kalathanoor	—
Othapanai	—
Nochinayal	—
Kooniyoor	—
Mallivayal	—
Puthenthal	—
Chethanendal	—
Allikulam	—
TOTAL	11,583

APPENDIX VI

DEPARTMENT OF AGRICULTURE

From

Shri A. Venkatesan, I.A.S.
Director of Agriculture,
Chepauk, Madras-5.

To

Shri D.S. Borker,
Secretary, Minor Irrigation Team,
Committee on Plan Projects,
Krishi Bhavan, Queen Victoria Rd.
NEW DELHI.

L. Dis. SS. 669/58 dated 7-11-58.

Sir,

Sub: Notes on tube wells, Filter Point wells etc.

Ref: 1. Your letter No. COPP/I&P/, dated 26-8-58 addressed to the Chief Engineer for Irrigation, Madras-5.

2. D. O. 3673/58-M-20, dated 1-9-58 from the Chief Engineer for Irrigation, Madras-5, addressed to you and copied to this office.

I furnish the following remarks in respect of filter point scheme, on the points raised in the reference 1st cited.

(i) Paragraph one does not clearly state the stage at which loan is advanced for the filter point construction as distinct from the supply of the pumpset:-

Every application for sinking a filter point tubewell in individual holdings, should be accompanied by a chalan for Rs. 25 remitted as Registration fee. (This amount is intended to be adjusted towards the hiring charges for departmental boring set used for sinking the filter point tube well). On receipt of the application, the District Agricultural Officer/Assistant Agricultural Engineer or his subordinate will inspect the site intended for installing the tube well. If it is considered desirable to try in that holding the sinking of a tube well, then the necessary equipment (i.e.) Hand Boring set with all the accessories will be moved to the site and boring operations taken up. A nominal fee Rs. 5 per day is charged as Hire charges for the equipment used. (No transport, charges for moving the equipment to or from the site are collected). The registration fees of Rs. 25 will be adjusted towards the hiring charges at Rs. 5 per day on the equipment.

After installing the tube well, it is tested by the departmental testing engines and if found to be successful, then the applicant will be recommended for being granted a loan to purchase pumping machinery to be fitted to the tube well. The applicant will be required to produce solvency Certificate from the Revenue Department, to ensure that he is sufficiently solvent for granting the loan. (His solvency should be $1\frac{1}{2}$ times the loan to be granted to him). He should produce two personal surities as security or in the alternative, he may offer his landed property or any other immovable property as security by mortgaging the same to the Government. In the latter case production of encumbrance Certificate from the Registration Department for a period of 13 years is insisted upon. The applicant will be asked to execute a Hire purchase agreement on Rs. 1-8-0 stamped paper.

Only on completing all the above formalities, is the loan sanctioned and disbursed in kind. The maximum amount of loan granted is Rs. 2,500 which is recovered in 5 equal annual instalments, with interest at $5\frac{1}{2}$ % per annum. Besides centage charges at 3% over the capital cost of the machinery supplied is also collected to cover the establishment charges.

The loan is not given in cash, but only in kind (*i.e.*) by way of pumping machinery, treating the same on hire purchase. A single ryot can be supplied with more than one filter point tube well provided it is sunk in his lands and that he is sufficiently solvent.

As regards the supply of pumping machinery (*i.e.*) oil engine or electric motor with pumpset, a list of approved firms with approved makes, as selected by Director of Agriculture is given to the ryot who is given choice to select one within that approved list, then the District Agricultural Officer, directly places supply order with the firm or firms and after the party has expressed his satisfaction over the working of the unit, the firm's bill is settled, by the District Agricultural Officer/Assistant Agricultural Engineer by drawing the amount from out of the loan amount sanctioned to the respective ryot.

The District Agricultural Officer/Assistant Agricultural Engineer is empowered to execute the hire purchase agreement on behalf of the Government. The Deputy Director of Agriculture sanctions the loan and the District Agricultural Officer/Assistant Agricultural Engineer disburses the same (*i.e.*) by supplying the pumping machinery.

(b) How much was irrigated from the completed filter points? What is the basis for the assessment of area irrigated on filter points?

A filter point can irrigate an area of 10 acres. Additional production per filter point is 5 ton. This is only a yardstick to assess the utility of each filter point well, and the additional production is arrived at based on the presumption that the filter point well is put to its normal use. The information of the actual area irrigated by each filter point is not available with this department.

Yours faithfully,
SD./
for Director of Agriculture.

APPENDIX VII

Descriptive Memoires

Descriptive—Position and Extent of Minor Basin-Rivers and Sources of Supply—Rainfall available for storage—Number of irrigation works—Grouping and financial details of irrigation works.

Statement of financial details of the irrigation works in the.....minor series.																																																														
Group Subgroup	No. in group or isolated work	Name and description of irrigation work	No. in District Irrigation Register	Items of Irrign. whether Govt., Zamin, or Inam	Total irrigable ayacut	Full asses-ment on Land and water	Average cultivation during the 5 years 1882 to 1886																																																							
							I Crop		II Crop																																																					
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	Extent	Land Revenue	Water Rate	Extent	Land Revenue	Water Rate																																																	
								(9)	(10)	(11)	(12)	(13)	(14)																																																	
<table border="0" style="width:100%; border-collapse: collapse;"> <tr> <td style="width: 50%; vertical-align: top;"> <table border="0" style="width:100%;"> <tr> <td style="border-top: 1px solid black;">Gross Assessment</td> <td style="border-top: 1px solid black;">Land Revenue</td> <td style="border-top: 1px solid black;">Water Rate</td> <td style="border-top: 1px solid black;">Total (15+16)</td> </tr> <tr> <td></td> <td>(11+14)</td> <td>(16)</td> <td>(17)</td> </tr> </table> </td> <td style="width: 50%; vertical-align: top;"> <table border="0" style="width:100%;"> <tr> <td style="border-top: 1px solid black;">Deductions and remissions</td> <td style="border-top: 1px solid black;">Fixed</td> <td style="border-top: 1px solid black;">Temporary</td> <td style="border-top: 1px solid black;">Occasional</td> <td style="border-top: 1px solid black;">Total</td> </tr> <tr> <td></td> <td>(17a)</td> <td>(18)</td> <td>(20)</td> <td>(21)</td> </tr> </table> </td> </tr> <tr> <td colspan="4" style="border-top: 1px solid black;">Average cultivation during 5 years 1882-86</td> <td colspan="5" style="border-top: 1px solid black;">Net Revenue due to Irrigation including working expenses (16-21)</td> <td colspan="4" style="border-top: 1px solid black;">Net Revenue per acre Irrigated (22-9)</td> </tr> <tr> <td colspan="4" style="border-top: 1px solid black;">(15)</td> <td colspan="5" style="border-top: 1px solid black;">(19)</td> <td colspan="4" style="border-top: 1px solid black;">(22)</td> <td colspan="4" style="border-top: 1px solid black;">(23)</td> </tr> </table>													<table border="0" style="width:100%;"> <tr> <td style="border-top: 1px solid black;">Gross Assessment</td> <td style="border-top: 1px solid black;">Land Revenue</td> <td style="border-top: 1px solid black;">Water Rate</td> <td style="border-top: 1px solid black;">Total (15+16)</td> </tr> <tr> <td></td> <td>(11+14)</td> <td>(16)</td> <td>(17)</td> </tr> </table>	Gross Assessment	Land Revenue	Water Rate	Total (15+16)		(11+14)	(16)	(17)	<table border="0" style="width:100%;"> <tr> <td style="border-top: 1px solid black;">Deductions and remissions</td> <td style="border-top: 1px solid black;">Fixed</td> <td style="border-top: 1px solid black;">Temporary</td> <td style="border-top: 1px solid black;">Occasional</td> <td style="border-top: 1px solid black;">Total</td> </tr> <tr> <td></td> <td>(17a)</td> <td>(18)</td> <td>(20)</td> <td>(21)</td> </tr> </table>	Deductions and remissions	Fixed	Temporary	Occasional	Total		(17a)	(18)	(20)	(21)	Average cultivation during 5 years 1882-86				Net Revenue due to Irrigation including working expenses (16-21)					Net Revenue per acre Irrigated (22-9)				(15)				(19)					(22)				(23)			
<table border="0" style="width:100%;"> <tr> <td style="border-top: 1px solid black;">Gross Assessment</td> <td style="border-top: 1px solid black;">Land Revenue</td> <td style="border-top: 1px solid black;">Water Rate</td> <td style="border-top: 1px solid black;">Total (15+16)</td> </tr> <tr> <td></td> <td>(11+14)</td> <td>(16)</td> <td>(17)</td> </tr> </table>	Gross Assessment	Land Revenue	Water Rate	Total (15+16)		(11+14)	(16)	(17)	<table border="0" style="width:100%;"> <tr> <td style="border-top: 1px solid black;">Deductions and remissions</td> <td style="border-top: 1px solid black;">Fixed</td> <td style="border-top: 1px solid black;">Temporary</td> <td style="border-top: 1px solid black;">Occasional</td> <td style="border-top: 1px solid black;">Total</td> </tr> <tr> <td></td> <td>(17a)</td> <td>(18)</td> <td>(20)</td> <td>(21)</td> </tr> </table>	Deductions and remissions	Fixed	Temporary	Occasional	Total		(17a)	(18)	(20)	(21)																																											
Gross Assessment	Land Revenue	Water Rate	Total (15+16)																																																											
	(11+14)	(16)	(17)																																																											
Deductions and remissions	Fixed	Temporary	Occasional	Total																																																										
	(17a)	(18)	(20)	(21)																																																										
Average cultivation during 5 years 1882-86				Net Revenue due to Irrigation including working expenses (16-21)					Net Revenue per acre Irrigated (22-9)																																																					
(15)				(19)					(22)				(23)																																																	

APPENDIX VII—contd.

Increase over present extent (Col. 9)	Proposed cultivation				Estimated outlay to secure standard of efficiency			Expected increase of Revenue % of outlay 28 x 100	REMARKS	
	Land unfit for wet cultivation	Ultimate extent of irrigation	Expected Net Revenue	Expected increase of Revenue (27-22)	Original works	Repairs	Total			Outlay % on ultimate net Revenue
(24)	(25)	(26)	(27)	(28)	(29)	(30)	(31)	(32)	(33)	(34)
									31	

APPENDIX VIII

RULES GOVERNING FINANCIAL ASSISTANCE FOR FOOD PRODUCTION SCHEMES DURING SECOND FIVE YEAR PLAN

Scope: These rules will apply to all schemes which aim at increasing the production of the following :

- (1) All Cereals (2) Grams and pulses (3) Tuber crops including potatoes and sweet potatoes (4) Fish.

II. Classification and Definition.

Food production schemes can be broadly divided into two categories viz.;

(a) Permanent or works scheme and (b) Recurring or supply schemes.

(1) Permanent or works schemes are again of two main types viz.

(a) Minor irrigation schemes including irrigation by lift appliances and

(b) Land improvement schemes including land reclamation.

(a) *Minor Irrigation Schemes*:—These may be of the following types:—

(i) Surface percolation wells, including construction of new wells and deepening of old wells, any improvements like re-excitation, boring and installation of open or small diameter strainer tubes or similar works calculated to increase water supply. Similarly water lifting appliances like Rahats, Persian Wheel and pumps are also included in Minor Irrigation Works.

(ii) *Irrigation tube wells*:—These include appurtenant plants and machinery necessary for the supply of water of and also the distributary channels.

(iii) *Tanks and channels*:—These include all types of surface storage and gravity irrigation works; extension and improvement of old tanks and channels as well as the construction of new tanks, dams and bandharas, including nala bunds and khulas in hilly areas.

NOTE:—Any individual scheme or work falling under any of the above three categories which is estimated to cost more than Rs. 10 lakhs, will be normally treated as medium or major irrigation scheme falling outside the purview of the Food Production Plan. This will, however, not apply to any such scheme which had been sanctioned previously under the G.M.F. and remain to be completed.

(b) *Land Improvement Works*:—These include all permanent works other than irrigation works which are designed either to bring uncultivated lands under cultivation or durably or permanently to increase the annual yield of lands already under cultivation. Land improvement works include items such as:—

(i) Drainage works which are not only protective but also aim at increasing food production.

III. Basis of Financial Assistance:—

Financial assistance will be in the following form:—

(A) Grants and (B) Loans.

(A) Grants:—Grants otherwise known as subsidies will be given by the Government of India to the States in order to meet a portion of the net expenditure of food production schemes defined above in the following manner:—

- (i) In case of States in Parts A and B of the first Schedule of the Constitution, except, Assam, Orissa and Kashmir 50% of the net expenditure on the schemes:
- (ii) In case of Assam, Orissa and Kashmir, Government of India's subsidy will be 66⅔% of the net expenditure.
- (iii) In the case of part 'C' States and other centrally administered States except Coorg, the entire net expenditure will be borne by the Government of India;
- (iv) In the case of Coorg, the Central share of subsidy will be 75% of the net expenditure.

(B) The principles of financial assistance for the various categories of Food Production schemes referred to above are given below:—

Minor Irrigation Schemes

(a) (i) A Scheme yielding a return of 4½% per annum would reimburse over a period of 20 years only 90% of the expenditure incurred. Such a scheme should be considered as economic deserving no subsidy from the Centre.

(ii) If a scheme yields less than 4½%, the subsidy will be worked out on the differences between the return at the rate of 4½% and the actual return over a period of 20 years. As for example if a scheme costs Rs.1,000 the return of 4½% would bring Rs. 900 over a period of 20 years. This scheme should be regarded as economic and no subsidy would be payable. In case, however, the return is say 4% the yield over a period of 20 years would come to Rs. 800 and the total shareable subsidy will work out to Rs. 100 (Rs. 900—Rs.800). As per latest orders of Government the eligible subsidy is either 14 the cost of the Scheme or the above whichever is less.

Land Improvement Scheme

(i) All schemes, whether permanent or recurring, will be formulated for one year by the Government of the State concerned and sent to the Government of India, Ministry of Food and Agriculture in the prescribed proforma in use at present, with an explanatory note giving their salient features, not later than 31st Oct. of the preceding year. In addition to the proforma, the State Government should also fill up the consolidated abstract statement as heretofore. Both these proformas should be forwarded in triplicate to the Ministry of Food and Agriculture and one set each simultaneously sent direct to the Planning Commission, Ministry of Finance (Agriculture Division) and to the Economic and Statistical Adviser to this Ministry.

(ii) While the Government of India do not desire to go into the technical details of a scheme, they desire to have sufficient details in order to enable them to judge the productiveness and soundness of a scheme in order to decide whether it deserves the financial assistance asked for. The general principle in judging the schemes will be of producing maximum of permanent results at minimum cost within the prescribed period of the plan.

(iii) On receipt of these schemes they will be examined in the Ministry of Food and Agriculture in the light of the above rules and the policy of the

Government of India from time to time. The scheme will then be discussed with the representatives of the State Governments concerned and of the Central Ministry of Finance and the Planning Commission.

(iv) Progress report on Food Production Schemes will in future be on a quarterly basis instead of on monthly, half yearly and annual basis as before. There will be thus four quarterly reports in the year for the quarters ending September, December, March and June. The second and fourth quarterly reports for the periods ending December and June, will cover the two crop seasons *viz.* Kharif and Rabi respectively. The first and third quarterly reports for the periods ending September and March will contain information relating to targets and achievements in respect of units of works only while the second and fourth quarterly reports will deal with targets and achievements in respect of units of work, acreage and additional production. These reports will be submitted in the prescribed proforma already in use. In the case of fisheries Schemes, the report should be submitted in a separate proforma already in use at present. The reports for each quarter should be submitted to the Government of India, E. & S. Div. direct by the 20th of the month succeeding the quarter to which the reports relate.

(v) Loans for Grow More Food Schemes are sanctioned on the basis of requirements in a particular financial year and unutilised portions thereof, if any have to be surrendered at the end of the financial year (*i.e.* by 31st March, and in any case by 15th April when the accounts relating to the preceeding year are finally closed).

APPENDIX X

ACT No. I of 1858

(THE MADRAS COMPULSORY LABOUR ACT, 1858)

(20th January 1858)

An Act to make lawful compulsory labour for the prevention of mischief by inundation, and to provide for the enforcement of customary labour on certain works of irrigation in the Presidency of Fort Saint George.

WHEREAS the safety of person and property is endangered by inundations caused by sudden breaches of the embankments of tanks, rivers and canals, and of anicuts and other like works; and it is necessary for the common good to make it obligatory on persons, when duly called upon, to unite their labour to prevent such breaches, or to repair them instantly; and whereas it is expedient to make legal provision for the enforcement of the duty, which by local custom is incumbent on village communities, to furnish the labour required for the execution of certain works for the purpose of irrigation and drainage; It is enacted as follows:—

1. Whenever it shall appear to the Officer in charge of any tank, river or canal, or of any anicut or other like work, that there is imminent danger of the embankment of such tank, river or canal being breached, or of a breach being made in such anicut or other work, and of a destructive inundation being caused thereby, which may be prevented by a large body of (Persons) immediately working together to strengthen the embankment or other work, or when such a breach has occurred, if it shall appear to such Officer that it can be repaired, and the inundation caused by it be stopped, by the immediate employment of a large body of (Persons) for that purpose, it shall be lawful for such Officer to require the head or heads of the village or villages in the vicinity to call upon all able-bodied male persons in such village or villages to co-operate in the work necessary for preventing or repairing the breach, as the case may be.

In the absence of the said Officer, it shall be lawful for the Tahsildar of the Taluq to make such requisition in his stead.

And if neither the said Officer nor the Tahsildar is on the spot, and the emergency is great and urgent, it shall be lawful for the head of the village in which the breach is expected to occur or has occurred, of his own motion, to call upon (all able-bodied male persons) of his own village, and, if needful, to make a requisition to the heads of the neighbouring villages to call likewise upon (the able-bodied male persons of their villages), to co-operate in the work necessary for preventing or repairing the breach.

2. Any male person being duly called upon by the head of his village to labour as aforesaid, who shall refuse or neglect to comply with such call without any lawful excuse shall, on conviction before a Magistrate, be punished with a fine which may extend to one hundred rupees, or with simple imprisonment which may extend to one month, or with both.

3. Every person who shall be employed on such work, under such requisition shall be paid for his labour by day at the highest rate paid in the neighbourhood for similar work and, if he is required to work at night, at double such rate.

4. Payment shall be made to (such persons) from the public treasury; and if (they) shall have been employed upon a work belonging to a private person, the amount advanced from the treasury shall be recoverable from such person by the same means which may be lawfully used for the recovery of arrears of land-revenue.

5. It shall be lawful for heads of villages, on the requisition of the Officer in-charge of such works, as aforesaid or in his absence, on the requisition of the Tahsildar is on the spot of their own motion, to make requisitions upon the inhabitants of their villages for the supply of materials, to wit, earth, stone, trees and leaves, bamboos, straw, gunny bags and the like necessary for preventing or repairing breaches in the embankments of tanks, river or channels, and to remove or seize, and if, necessary, to cut down such materials wherever they may be found, giving receipts for them in writing; such materials shall be paid for from the public treasury at the highest prices for which they are sold in the neighbourhood and in case damage is sustained by any person in consequence of the removal, seizure or cutting down of any such materials, compensation shall be made for such damage, the amount of which compensation shall, in case of dispute, be determined in the same manner as amounts payable under section 6. When the work for which such materials are used belongs to a private person, the amount advanced from the treasury shall be recoverable from him by the same means by which arrears of land revenue are recoverable.

6. Whenever by local custom any work for the purpose or irrigation or drainage, or connected therewith, is usually executed by the Joint Labour of a village community, any person bound by such custom to contribute labour to such work, who neglects or refuses without reasonable cause to comply with a requisition for such customary aid made to him by the head of the village under the orders of the Tahsildar or other superior Revenue Officer shall be liable to pay a sum equal to twice the value of the labour which he is bound to contribute.

The amount so payable shall, in case of dispute, be determined summarily by a Village Panchayat assembled by order of the Collector through the village Munsif according to the rules for assembling such Panchayats prescribed in Regulations V and VI of 1816.

Such amount shall be payable on demand; and, on non-payment, the same may be recovered by the same means by which arrears or land-revenue are recoverable.

All sums paid or recovered under this section shall be applicable to the expenses of any works for the purpose of irrigation or drainage executed for the benefit of the village Committees to which the defaulters respectively belong.

APPENDIX XI

Copy of B.P. Mis. No. 1027 dated 8th August 1957

SUB:— Irrigation-General—Minor Irrigation sources—maintenance and repairs—standing ledger of minor irrigation sources—Maintenance of in Taluk offices—Proposal—orders passed.

Ref:—From the Collector, . . .

Do.	Tiruchirapalli A. 4. 36980/55 dated 30-11-1955.
Do.	North Arcot L. 2089/56 dated 7-2-1956.
Do.	Chingleput D. Dist. 2772/56 dated 6-2-1956.
Do.	Coimbatore 3362/56 C. 9 dated 14-2-1956.
Do.	Madurai L. Dis. 4195/56 dated 19-2-1956.
Do.	Salem L. Dis. 3113/56 dated 29-2-1956.
Do.	Tanjore L. Dis. 3103/56 J. dated 7-3-1956.
Do.	South Arcot L. Dis. 2536/56 dated 6-3-1956.
Do.	Tirunelveli L. Dis. 2302/56 dated 8-3-1956.
Do.	Ramnad L. Dis. 2856/56 dated 19-3-1956.

*Resolution—*The Collector of Tiruchirapalli proposed the maintenance of a standing ledger of Minor Irrigation sources in each Taluk Office in the same form as the one now maintained in Collector's Office in order to ensure efficient maintenance of irrigation sources and to prevent unnecessary frequent repairs being done to one and the same sources. The Collectors of other districts consulted in the matter also agree to the proposal.

2. The circle system of repairs to Minor Irrigation sources has not been enforced in the Districts in B.P. Mis. 77 dated 10-7-57. Under this system a register will have necessarily to be maintained showing the works under each circle and the year of repairs. The Collectors are requested to see that a register is opened and maintained in all the taluk offices in the enclosed form* for entering therein all minor irrigation sources according to circle system and for watching the progress of action taken in maintaining the sources in proper condition.

*Copy of form**Left Half*Standing ledger of Minor
Taluk

Name of source.

Name of Minor basin and the No. of page in the Tank Restoration Scheme
Descriptive Memoir Book in which a description of the work is given.

Total irrigable ayacut.

Assessment.

Year of sanction of estimate	No. and date of sanction of estimate and its nature <i>i.e.</i> original works or repairs and maintenance.	Brief description of nature of repairs	Amount of estimate and year in which funds were actually allotted
(1)	(2)	(3)	(4)

Right Half

Irrigation sources

Village

Survey No.
Name

Class

Capacity

Nature of source.

Acres
Rs. A.Acres
Rs. A.Acres
Rs. A.Acres
Rs. A.Acres
Rs. A.

Amount actually spent in

Extent irrigated and revenue realised

Year	Year	Year	Year (Fasli-war)	Extent irrigated	Revenue realised
(5)	(6)	(7)	(8)	(9)	(10)

APPENDIX XII

Copy of B.P. Mis. 877 dated 10-7-57 (Revenue Dept.)

SUB:— Irrigation-General—Minor Irrigation works in charge of Revenue Department—Systematic maintenance and repairs of minor irrigation Works—introduction of circles system—instructions issued.

Read:—

1. B.P. Mis. 2425 dated 17-7-1936.
2. Board's Ref. W. 529/43-1 dated 9-2-1943.
3. B.P. Mis. 324 dated 31-3-1949.

Resolution—According to clause (v) of B.S.O. No. 87 the Collector should settle for each financial year not later than December of the preceding year a programme of works to be taken up in the year and the order of their urgency and should allot funds to the works. In order to enable the Collector to settle the programme the Tahsildars should submit to the Collector not later than 1st November of each year proposals regarding the works to be executed during the following year with reference to the information available in the register maintained by them in accordance with the instructions contained in Appendix VI to B.S.O. No. 87. In settling the programme only works for which there are sanctioned estimates should be selected.

2. Information regarding the sources in need of repairs was collected from Revenue Inspector's Dairies, Jamabandy check memoranda and reports from Tahsildars or petitions from ayaoutdars in individual cases and works were then taken up indiscriminately for investigation and execution in different corners of the taluks in the districts as a result much of the time of the irrigation was wasted and sources not coming to notice were not infrequently left unrepaired for years. With a view to ensure systematic inspection of the minor irrigation sources in the districts and to devote proper attention to the maintenance of the sources the Government in G.O.Ms. 1432 Revenue dated 6-6-1936 ordered that the Circle system should be introduced in all districts where, in the opinion of the Collector, the conditions were favourable. Instructions were accordingly issued to Collectors in B.P. Mis. No. 2425 dated 17-7-36. In 1943 the Government considered that in the interest of food production Collectors should suspend the circle system of repairs to minor irrigation works where necessary and give preference to tanks which will increase the acreage under food crops. As under the circle system of inspections, the minor irrigation sources in each circle are attended to in rotation with the result that the sources included in a particular circle will get their turn only once in 4 or 5 years, the Government in 1949 examined the question of making the inspection of the minor irrigation sources more frequent and directed in G.O.Ms. 455 Revenue dated 24-2-49 that without prejudice to the circle system minor irrigation overseer should inspect every minor irrigation work in the district once a year and if possible oftener and should keep an accurate record of the conditions of each minor irrigation work as ascertained by those inspections. They also ordered that repairs necessitated by unforeseen occurrences like floods, should continue to be attended to immediately as usual.

3. The Board has observed from the monthly reports of the Collectors on the progress of expenditure and execution of works that the instructions in the B.S.O. regarding the preparation of estimates in advance *i.e.* in the previous year, have not been strictly followed and that estimating as well as execution is done in the same year. It has also noticed that the Circle system was not in vogue in many districts. With a view to examine the working of the Circle system and its reintroduction in all the districts the Collectors have been consulted in the matter. It is seen from the Collectors' reports that the Circle system has not been adhered to, except in North Arcot and Salem Districts. The Circle system which was introduced in 1936 was suspended in Tanjore, Madurai and Tiruchirapalli Districts. It was never introduced in Coimbatore and Ramanathapuram Districts. In South Arcot it was not followed until the year 1955. In Chingleput it was continued till 1948 to 1949. In Tirunelveli it was introduced in 1938 but was not followed rigidly. The main reasons for the non-adherence to the Circle system were:—

- (i) The orders of the Government in G.O.Ms. No. 1432 Rev. dated 6-7-1936 give discretion to the Collectors to introduce the system wherever the conditions were favourable.
- (ii) Due to adverse seasonal conditions a large number of sources have to be repaired for providing labour to the distressed agriculturists and the circle system could not be followed.
- (iii) The orders of the Government to suspend the Circle System where necessary and to give preference to tanks which would increase acreage under food crops with a view to augment food production, and
- (iv) The orders of the Government directing the inspection of all the minor irrigation sources every year.

4. Under the Circle system of inspection, each taluk is divided into a number of convenient circles compact and contiguous to each other and minor irrigation sources in each circle are attended to in rotation. It has many advantages. The work of the minor irrigation staff will be confined to a limited area and the number of sources to be attended to by each minor irrigation overseer within a year would be fixed. While investigation and estimation of works in one circle is going up, execution of works in an adjacent circle will be attended to simultaneously. All the Collectors except those of Coimbatore and Ramanathapuram are in favour of the introduction of the circle system of repairs. With a view to ensure systematic inspection of the minor irrigation sources in the districts and to devote proper attention for the maintenance of the sources in good condition, the Board has decided that the Circle system ordered in G.O.Ms. No. 1432 Revenue dated 6-6-1936 should be enforced and followed rigidly in the districts and directs the Collectors to take action accordingly.

5. The Collector of Coimbatore stated that it is not necessary to introduce the Circle system in his districts as there are only 18 anicut channels and 64 tanks. There are no minor irrigation sources in two taluks and also in any of the estate areas in the District and it is possible to inspect all the sources every year. The Board considers that even if the sources are few, there is no harm in following up the circle system in this district also, as it is not necessary to take up execution of works in respect of all sources every year.

6. The Collector of Ramanathapuram reports that the conditions now prevailing in his district are not favourable for introducing the circle system immediately as the district consists mainly of estate areas and most of the tanks in these areas have not been repaired for many years prior to the taking over of the estates by Government, that many tanks have also breached due to Cyclone and floods in 1955 and that priority has to be given with reference to the urgency of the particular work. He states that the circle system can be introduced only after bringing all the tanks in estate areas in good condition by which time the settlement work will also be completed and ryotwari system will be introduced. The Collector is informed that in respect of the sources in Ex-estate areas which have been neglected for covered years prior to the taking over of the estates a special accelerated circle should be worked out so that the initial round of repairs may be finished in the shorter period and after the initial round is over, they may be arranged in the ordinary circle scheme in the district. As and when the estate works are repaired, the cycle should be expanded and these works should be fitted into them. When works are carried out by the Public Works Department or taken up under the special minor irrigation programme they should be deleted from the cycle of the corresponding year.

7. As regards the number of circles that should be formed, the Collectors have suggested different number according to the number of works in their districts and the No. of minor irrigation overseers available. According to the Circle system in vogue in South Arcot a six year programme has been evolved beginning from 1955-56 and extending to 1960-61 and the Government in G.O.Ms. 199 Revenue dated 25-1-55 have approved of it and have directed the Collector to adhere to it maintaining steady progress right through. The Circle system drawn up by the Collector, South Arcot, (Sri Uthandaraman I.A.S.) clearly provides for estimation to be done in the previous year itself for works to be executed in the current year. A copy of the Collector proceedings A6/27196/54 dated 15/12/54 is enclosed. The Collectors are requested to draw up a Circle system with six or seven years programme as is suitable to their districts and adhere to the programme without deviation. Any minor irrigation overseer found to be not covering the whole circle within the year, should be properly dealt with unless he has a plausible explanation to give.

PROCEEDINGS OF THE COLLECTOR OF SOUTH ARCOT,
CUDDALORE

Present: Sri A. Uthandaraman, I.A.S. Collector

RS.A6/27196/54 dated 15-12-54.

SUB:— *Irrigation—Minor—South Arcot District—Investigation and execution of repairs to Minor Irrigation sources—Six year Cycle-system—Intorduction ordered.*

In order to ensure systematic and periodical investigation and execution of repairs to all the minor irrigation sources in this district, it has been decided to introduce a six year Cycle-system of repairs, as shown in appendix A in supercession of all previous orders on the subject.

2. The system will commence from the year 1955-56 *i.e.*, from 1-4-55. All the Minor Irrigation sources in each taluk have been grouped under the

years 1955-56 to 1960-61 with reference to the relative urgency and need for repairs taking into account as far as possible the year when the source was last repaired.

3. The works programmed for the year 1955-56 should be taken up for investigation forthwith and necessary estimates prepared and submitted for Collector's sanction. In the case of Minor Irrigation tanks having an ayacut of more than 80 acres the question of constructing weirs in the place of the existing calingulas should be examined and necessary provision made in the estimates in this direction. The question of clearing of supply channels should also receive the attention of the officers.

4. It may be possible to take up some of the works under the year 1955-56 and execute necessary repairs during the current year itself, so that the allotment under minor irrigation for 1954-55 may be spent in full before 31-3-55. In case there are no sanctioned estimates on hand at present to cover the balance of allotment now available. The Tahsildars are therefore requested to pay their special attention in this direction.

5. Normally there should be no deviation from the programme now communicated. If, however, after investigation it is found that if a source is in bad state requiring preference over another sources, the general condition of which is better, Collector's approval should be obtained for necessary deviation from the programme.

6. If the Minor Irrigation overseer, after inspection of particular source is satisfied that no repairs need be executed during the year programmed or that the proposal may be deferred altogether, he should report accordingly to the Tahsildar. The Tahsildar after inspecting the source will decide whether it requires repairs or not. If the source is not in need of the repairs, action should be taken as indicated in para 5 above, to get the work deleted from that year's list.

7. The Cycle system now introduced will take effect from 1-4-55 and will be in force till 31-3-61. As a rule, estimates for the works programmed to be taken up in the ensuing year should be got sanctioned before the 31st March of the preceding year. As regards the works programmed for the year 1955-56 the instructions in paragraph 3 of this reference should be followed. The Revenue Divisional Officers and Tahsildars are requested to see that necessary estimates in respect of the works under the programme for 1955-56 are prepared and submitted for Collector's sanction not later than 28-2-1955. The Revenue Divisional Officers are specially requested to see that the instructions in this regard are strictly followed.

8. As regards the preparation of estimates for works programmed for the year 1956-57 and onwards, Tahsildars should see that necessary estimates are submitted for Collector's sanction not later than the 31st December of the previous year so that they may be sanctioned sufficiently in advance of the Government of the programme year.

9. At the end of each financial year, Tahsildars should submit to the Collector along with their annual return a statement showing the works left un-attended to during the year and those attended to outside the Circle, with reasons therefor.

10. A register should be opened in the taluk and the Divisional Officer entering therein the minor irrigation sources as per Circle system now approved to watch the progress of action taken in maintaining the sources in proper condition.

11. The Collector is of opinion that the inspection of sources by Revenue Divisional Officers and Tahsildars has so far been inadequate with the result that so many sources were frequently proposed for execution of repairs while some sources were neglected for a number of years in succession. To remedy this situation the present six years Cycle system has been evolved.

Therefore Revenue Divisional Officers and Tahsildars are requested to make it a point to inspect as many sources as possible during their tours and keep themselves in close touch with the condition of the irrigation sources in their charge. So far, Tahsildars do not appear to have invoked the provisions of the Kudumaramath Act wherever ayacutdars failed to contribute their customary labour to keep the supply channels etc. in good repair. Such lapses should not recur. The receipt of the proceedings should be acknowledged atonce.

APPENDIX XIII
List of Tanks examined for Desilting-cum-Reclamation Scheme

Name of District and Taluk.	Name of tank.	F.C.	C.C.	Nature of catchment.	Capacity in Ml. Cft.		Siltage.	Percent- age Siltage.
					(6)	(7)		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
<i>Ramnad</i>								
1.	Emanaswaram Tank	..	7.5	Plain	168.0	184.0	16.0	9
2.	Ramankottai Tank	..	1.1	"	60.9	80.9	20.0	25
3.	Malkanjaran kulam	..	0.3	"	10.2	12.5	2.3	18
4.	Pondampatti tank	..	7.0	"	35.0	37.2	2.2	6
5.	Pootagarangal tank	..	4.0	"	23.2	29.9	6.7	22
6.	Sirumarudur tank	..	1.3	"	10.2	13.6	3.4	25
7.	Kanjarangal tank	..	1.16	"	5.5	8.0	2.5	31
8.	Pillarutham tank	..	1.25	"	5.0	6.7	1.7	25
9.	S. Nangoor tank	..	1.00	"	10.3	14.3	4.0	28
10.	Tiruvedanokam	..	0.22	"	5.83	7.48	1.65	22
11.		..	0.93	"	7.3	12.9	5.6	44
12.	Pithampadu Tank	..	7.10	"	17.68	21.45	3.77	18

APPENDIX XIII—contd

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	<i>Madurai—Madurai</i>								
13.	Nayarkulam	.. .. .	.. .. .	12.5	Hilly	7.94	15.74	7.70	49
14.	Nallacheri tank	.. .. .	.. .. .	0.75	Plain	6.28	9.56	3.21	34
15.	Tadiapari tank	.. .. .	.. .. .	10.5	"	23.22	27.99	4.77	17
16.	Mannavarathi tank	.. .. .	.. .. .	23.3	"	5.13	13.50	7.37	55
17.	Keelakanmoi	.. .. .	.. .. .	2.3	"	1.00	2.00	1.00	50
18.	Ammakulam	.. .. .	.. .. .	1.12	Hilly	0.21	0.45	0.24	53
19.	Nedumadura Periakannoi	.. .. .	.. .. .	3.50	Plain	11.10	14.00	2.90	21
20.	Anaikulam	.. .. .	.. .. .	0.75	Hilly	5.00	6.60	1.60	23
21.	Namilipuram tank	.. .. .	.. .. .	8.5	Plain	30.00	40.00	10.00	25
22.	Athangarai-Cheriakulam	.. .. .	.. .. .	22.3	Plain	23.00	36.00	13.00	36
23.	Konarkulam	.. .. .	.. .. .	0.5	Hilly	5.53	7.67	2.14	28
24.	Vellakulam	.. .. .	.. .. .	0.9	"	6.60	7.05	0.39	6
25.	Munnadiseri	.. .. .	.. .. .	1.0	"	5.46	6.29	0.83	13
26.	Karisakkulam	.. .. .	.. .. .	1.75	Plain	10.98	13.52	2.56	23
	<i>Tiruchirappalli</i>								
27.	Sethi Eri	.. .. .	.. .. .	1.01	Plain	6.43	7.10	0.67	9
28.	Chatranamoi tank	.. .. .	.. .. .	5.01	Hilly	18.18	21.28	2.50	12
29.	Kavalapadi Eri	.. .. .	.. .. .	1.10	Plain	1.04	1.43	0.39	27
30.	Koilpatti Nagaleri	.. .. .	.. .. .	0.58	Plain	1.80	2.53	0.79	31

APPENDIX XIII—contd

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	
31.	Ralampalli Petral tank	.. ..	1.34	—	Hilly	10.10	12.76	2.66	21
32.	Kasbakarandi tank	.. ..	0.96	—	Plain	8.64	9.90	1.26	13
33.	Nathambu tank	.. ..	1.51	—	Plain	10.22	13.92	3.70	26
34.	Velandal tank	.. ..	1.19	—	Wooded	5.04	3.88	0.84	14
35.	Talayampakam tank	.. ..	0.70	10.69	Plain	6.08	6.38	0.30	5
36.	Alegandal	.. ..	1.85	6.97	Hilly	4.50	4.88	0.38	8
37.	Maruthambody	.. ..	1.50	1.95	Wooded	11.00	13.00	2.00	15
38.	Kalasthambody	.. ..	3.90	9.56	Plain	12.00	14.88	2.76	18
39.	Tenmundiyanur	.. ..	1.70	—	Plain	7.70	9.70	2.00	21
40.	Tatchan Padu Eri	.. ..	0.52	—	Plain	1.85	2.40	0.55	23
41.	Maranandal tank	.. ..	1.60	4.00	Plain	4.60	6.30	1.70	27
42.	Elavambody tank	.. ..	3.06	—	Hilly	6.40	10.60	4.20	40
43.	Ganganatha tank	.. ..	1.05	—	Hilly	2.03	8.80	6.77	77
<i>Chingleput</i>									
44.	Biman Jayal	.. ..	0.57	2.57	Plain	4.40	5.60	1.20	21
45.	Eraiyu tank	.. ..	1.00	—	"	9.60	11.00	1.40	13
46.	Siramankodu tank	.. ..	0.75	3.20	"	10.60	12.22	1.70	14
47.	Tirupandiyur	.. ..	0.92	—	"	6.82	11.80	—	—
48.	Kilokudi Kannoi	.. ..	0.70	—	Hilly	7.00	8.90	1.90	22
49.	Dudur tank	.. ..	1.31	—	"	12.60	14.40	1.80	12

APPENDIX XIV

Details of tanks in Chingleput District completed under Desilting-cum-Reclamation Scheme

Sl. No.	Name of Tank	Estimated cost	Ayacut		Extent gap proposed bridged	Water spread area at F.T.L. Meft.	Area reclaimed		Percentage
			As per memoir	As existing before D.C.R.			Private Patta Acres	Govt.	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
1.	Injambakkam Tank	24,500	467.98	362.00	106.00	5.90	3.20	Nil	2.3
2.	Veliyur Tank	24,500	868.52	676.43	51.50	15.82	20.12	"	6.1
3.	Karai Tank	12,500	533.00	494.00	39.00	9.32	3.00	"	1.4
4.	Sembarambakkam	16,000	344.00	246.62	28.20	4.18	13.00	"	13.5
5.	Audi Siruvallur	13,500	362.00	229.00	28.00	9.42	5.00	"	2.3
6.	Seyatti Tank	12,300	153.38	143.04	10.34	2.91	5.90	"	8.8
7.	Sirurakkam Big Tank	13,300	504.57	463.33	41.24	8.92	1.54	"	0.75
8.	Amarambedu	14,300	408.95	371.45	37.50	—	7.78	"	
9.	Vengadu Tank	20,600	313.19	285.19	28.00	7.50	27.39	"	15.7
10.	Pennalur Tank	9,000	333.27	312.27	21.00	5.54	6.40	"	5.0
11.	Somangalam Tank	25,200	504.15	361.11	60.00	14.03	45.00	"	13.9
12.	Nelvoy Tank	9,300	382.72	310.20	22.68	—	25.00	"	
13.	Mannivakkam Tank	15,800	201.96	193.86	8.10	7.10	3.00	"	1.8
14.	Madambakkam Tank	24,300	302.00	262.00	40.00	11.00	16.00	"	6.3
15.	Nandivaram Tank	23,000	839.00	599.00	240.00	12.68	20.00	"	6.9

APPENDIX XIV—contd.

Sl. No.	Name of Tank	Contribution any levied	Raising the F.T.L.	Extra water rate if any	Date of estimate submission	Date of sanction	Date of completion	Final cost of completion	Nature of crop raising in the re-claimed land	Double Bank details
(1)	(2)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
1.	Injambakkam Tank	.. ..	1-00'	Nil	6/54	11/57	5/57	18,473	Paddy	Top width 3'-0" with side slopes 1:1
2.	Veliyur Tank	.. ..	0-25'	"	4/57	2/58	5/57	19,743	"	"
3.	Karai Tank	.. ..	0-25'	"	4/57	8/57	6/57	9,336	"	"
4.	Sembarambakkam	.. ..	0-25'	"	4/57	8/58	6/57	11,843	"	"
5.	Audi Siruvallur	.. ..	0-25'	"	4/57	2/58	7/57	6,101	"	"
6.	Seyatti Tank	.. ..	0-25'	"	4/57	11/57	7/57	7,990	"	"
7.	Sirurakkam Big Tank	.. ..	0-25'	"	4/57	12/57	7/57	7,990	"	"
8.	Amarambedu	.. ..	0-25'	"	4/57	8/57	9/57	6,407	"	"
9.	Vengadu Tank	.. ..	0-25'	"	4/57	11/57	9/57	17,164	"	"
10.	Pennalur Tank	.. ..	0-25'	"	4/57	8/57	7/57	3,991	"	"
11.	Somangalam Tank	.. ..	0-25'	"	2/57	11/57	5/58	5,277	"	"
12.	Nelvoy Tank	.. ..	0-25'	"	12/57		8/58	—	"	"
13.	Mannivakkam Tank	.. ..	1-00'	"	3/58	9/58	9/58	—	"	"
14.	Madambakkam Tank	.. ..	0-25'	"	4/57	2/58	5/58	—	"	"
15.	Nandivaram Tank	.. ..	0-50'	"	11/55	2/58	8/58	—	"	"

The gap proposed to be made up is only given.

APPENDIX XIV—*contd*

I. THIMMASAMUNDRAM TANK

Estimate: Rs. 22,800

Registered ayacut	655 acres
Average cultivation	512 "
Irrigation by wells and pump set in the ayacut	270 "
Gap under tank irrigation	143 "
Catchment: Free	0.94 Sq. miles
Yield	24.38 M. Cft.
Annual storage capacity	24.38 M. Cft.
Maximum ayacut which can be irrigated by the storage.	$24.38 \times 12 = 292$ acres.

Average cultivation by the tank (512—270)=242 acres.

Gap in tank irrigation which can be bridged up—50 acres.

1. This tank is situated about $\frac{3}{4}$ mile west of Thimmasamundram village in Kancheepuram Taluk, close to mile stone 48 of Madras-Bangalore Trunk Road. It is an Inam source taken over by the Government.

2. *Condition of tank prior to repairs.*—The tank bund was below F.T.L. and was eroded at many places. Water was being wasted by over-topping and through erosions. There are three masonry sluices, all of which were badly leaking and almost delapidated and considerable quantity of water was being wasted, thereby.

3. The special repairs to the tank were taken up in October 57 and the provisions made in the estimate are as follows:—

- (i) Reconstruction of sluices 1, 2 and 3 with barrel and tower heads in front.
- (ii) 300 units of earthwork for strengthening the tank bund.
- (iii) Revetment to tank bund at eroded portions 140 units.
- (iv) Petty repairs to surplus escape.

All works as contemplated in the estimate have been completed except for 25 units of earthwork to tank and revetment at sluice sites.

4. As a result of special repairs to be carried out, a gap of 50 acres will be covered up under irrigation by the tank and a food value of $50/2$ plus $242/8 = 55$ tons will be achieved. The cost per ton works out to Rs. 415.

II. IMPROVEMENTS TO ARAPAKKAM RETTERI

1. *Location and Details of the Tank.*—Arapakkam village of Kancheepuram Taluk in Chingleput District is a village on the border of North Arcot District and is 6 miles from Kancheepuram. There are two tanks in the village lying on both sides of the Kancheepuram-Uttiramerur Road, and they are connected by two road culverts. The bigger part of the tank is called "Peria Eri", and the other is called by the name "Retteri".

Besides the drainage from the catchments, the tanks receive supply from the Gandumaduvu, the surplus course of Mamandur tank, through a supply channel, taking off from an ancient across the Maduvu. This supply is capable of carrying 200 cusecs at its F.S.L. condition. The Retteri, which lies on the border of North Arcot and Chingleput districts, has got its foreshore in Suruttal village in North Arcot District, while the tank-bed and ayacut lie in Chingleput district. The tank has got an ayacut of 123.99 acres, and also irrigates jointly with the Peria Eri another extent of 588 acres. The Retteri has two weirs and the Peria Eri has a single weir at its right flank. Prior to July 1955, the crest levels of all the three weirs were at 50.00 and this was the F.T.L. of the two tanks.

2. *Defects in surplus arrangements and foreshore submersion.*—The location of the longest weir in Retteri was such that the surplus flow of nearly 700 cusecs used to flow over the major part of the ayacut under the tank, every year in the months of November and December, when usually the first crop paddy is ready for harvest. Consequently the crops in about 250 acres of land were being washed away almost each year by this flood. The ayacutdars were requesting for the shifting of this middle weir to the left flank, so that the flood waters may be easily drained into Gundumaduvu running close by.

The lands of Suruttal village lying on the foreshore of this Retteri are so low that nearly 67 acres of valuable wet fields were getting submerged for 1½ to 2 feet depth, as long as the tank water in Retteri was at its F.T.L., and consequently the owners of those 67 acres were unable to raise any crop in most of the years. Whenever the question of shifting the middle weir of Arapakkam Retteri was considered, the Suruttal ryots demanded the lowering of the crest level of the weirs to reduce the submersion of their lands. Hence a solution had to be found to the problem of avoiding flood damages to the crops in 250 acres of the ayacut under the tank, and at the same time, preventing foreshore submersion of valuable lands.

The following works were executed as a permanent solution:—

- (i) A foreshore bund was formed along the border of Chingleput District, with two inlet sluices, 4' x 4' provided in it to allow the drainage from the catchment area in Suruttal village into Arapakkam Retteri. The inlet sluices were provided with flap shutters so that the vents may be closed as soon as water level in the Retteri reaches the level of 48.00 which is the level of foreshore lands in Suruttal village.
- (ii) A catch drain 20' wide was formed along the foreshore bund in the limits of North Arcot District so that the drainage from the foreshore catchment can be drained easily into Gundumaduvu, after the flap shutters of inlet sluices are closed.
- (iii) An aqueduct-cum-weir was constructed at the left flank of Retteri so as to dispose of the drainage flowing in the above catch drain, and at the same time to continue the supply to the tanks so that the tank may fill up from 48.00 to F. T. L. as usual without any difficulty. The vents of the aqueduct will pass a flood discharge of 776 cusecs and the trough of the aqueduct is designed to carry 200 cusecs at F.S.L. conditions.
- (iv) The crest level of the weirs was suitably raised to compensate the loss in storage of the tanks caused by the formation of the foreshore bund.

- (v) The crest level of the middle weir was raised by 1'-3" so that the surplus water of Retteri may not overflow this weir and damage crops in normal years, but function only as an emergency escape during extraordinary floods and rains in the catchment.

The above solution was accepted by the ryots of both villages. It was also seen during the last two years that the improvements carried out, functioned quite well, to the satisfaction of both the groups of ryots.

The total cost of the scheme is Rs. 45,000 and the additional yield of food-grain computed in the 317 acres (which were damaged previously year after year) was 160 tons. The cost of the scheme works out to Rs. 280 per ton of additional food-grain, and the work was taken up and completed under Special Minor Irrigation Programme.

III. CONSTRUCTING A TRAINING WALL IN THE KAVANTHANDALAM TANK SUPPLY CHANNEL

Estimate : Rs. 26,600

The Kavanthandalam Tank Supply Channel is running almost parallel to the left margin of the Cheyyar River and feeds two tanks with a total ayacut of 809 acres. During freshes in the river the right bank of the channel gets breached, cutting off the supplies to the tanks. To ensure adequate supply to the tanks and also to save the recurring expenditure in maintaining the channel, a masonry training wall with its top, just above the ordinary flood level of the river, was constructed for a length of 1,090 ft. above the head sluice. It is also seen at the site that the bed fall of the channel has to be very much flatter than the bed fall of the river to divert adequate supplies into the Kavanthandalam tanks. By the construction of the training wall, it was possible to tap the spring water as well as the flood flows into the channel at a higher point in the river than what could have been possible if the training wall had not existed. So the training wall indirectly serves the purpose of an anicut for diverting flood flows into the channel. By the execution of the scheme, an extent of 60 acres, which was once fallow, was now brought into cultivation under first crop. A second crop cultivation of 100 acres was also possible resulting in an extra production of 80 tons of rice per year.

The cost of the scheme is Rs. 26,600.

IV. CONSTRUCTING AN ADDITIONAL HEAD SLUICE AT THE UTHIRAMERUR TANK SUPPLY CHANNEL WITH 3 VENTS AND WIDENING THE EXISTING CHANNEL.

Amount of Estimate : Rs. 78,000

The Uthiramerur Anicut across Cheyyar river was constructed in the year 1947 for heading up water for a height of 4', taking into consideration the lower down riparian rights. But though 10 years have since elapsed, the Uthiramerur Tank and Tirupulivanam tank received full supply only twice during this period and the river flow could not be drawn into the supply channel owing to the restricted water-way provided in the existing head sluice. The present head sluice consists of 9 vents of 6' x 4', and it can draw at M.S.L. condition, only 695 cusecs whereas the demand is in the order of 1,500 cusecs.

assuming the duration of flood as 15 days in a year. Hence it was found necessary to increase the vent-way of the head sluice to draw an additional supply of 385 cusecs. 3 vents of 8' x 5' have now been constructed to satisfy this need. A spring vent of 4'-7 $\frac{1}{2}$ " x 1'-6 $\frac{1}{4}$ " has also been provided to safeguard the ayacut in Olugarai village, which is eligible for the spring flow in the river. The existing Uthiramerur Tank Supply Channel has also been widened to a bed width of 60' to draw about 1,500 cusecs with an F.S.L. depth of 6'. The work will be beneficial to draw the maximum flood flow into the Uthiramerur and Tirupulivanam tanks and pass down surplus waters to the lower-down tanks in the Basin. The existing remission under the two tanks will also be wiped off.

The total cost of the scheme is Rs. 78,000 and the food value is 350 tons of rice taking the yield as $\frac{1}{2}$ ton per acre. The work is being executed under the Special Minor Irrigation Programme.

V. DESILTING-CUM-RECLAMATION SCHEME

I. Name of work Injambakkam Large and Small tanks—Estimate Rs. 19,000.

II. Location Injambakkam large and small tanks are situated about 5 miles from Kancheepuram on Arkonam-Kancheepuram Road.

III. Hydraulic details :—

(a) Catchment free ... 0.31 Square miles.
 Catchment combined ... 0.74 Square miles.
 A supply of 29 cusecs is received from Kambakkal for 20 days.

(b) Yield from catchment 55 M. C. Ft.

(c) Capacity as per Memoir: .. 17.2 M. C. Ft.
 Annual storage 34.4 M. C. Ft.

(d) *Ayacut particulars*
 Registered ayacut 464 acres.
 Average cultivation 358 acres.
 Gap in cultivation 106 acres.

(e) Standards :

	Large Tank	Small Tank
F.T.L.	290.36	290.36
M.W. L.	291.56	291.36
T.B.L.	295.56	294.36
Top width	4'-6"	4'-0"
Side slopes :	2:1	2:1

(f) *Extent of Foreshore lands under submersion :*

32 acres of which 7 acres are peramboke lands.

Injambakkam tank has an ayacut of 464 acres and it is one of the tanks taken up under the Desilting-cum-Reclamation Scheme. The area at present under cultivation by the tank is 358 acres.

The capacity of the tank in the silted condition was only 11.27 M. C. Ft., against 17.2 M. C. Ft. prescribed in the memoirs. The F. T. L. of the tank was therefore raised by 1'—0" and the storage was increased by 5.66 M. C. Ft. The storage capacity of the tank for single filling after the desilting work, was raised to 11.27 plus 5.66=16.93 M. C. Ft. Assuming 2 fillings, the annual storage capacity of the tank was restored to 33.86 M. C. Ft.

There was a submersion of 13 acres of patta lands even at the old F.T.L. and an additional extent of 19 acres was also liable for submersion for the increased F.T.L. Desilting to the extent of 850 units (unit=1,000 Cft.) was done and the earth was deposited on the 32 acres of submersible lands. The level of deposition was kept so that there might be only 6 inches of submersion for the increased F. T.L. A dower bank with its top level one foot above the F.T.L. has been formed along the periphery of the foreshore lands with suitable open cuts to serve as out-lets. Besides a drainage course has also been formed in the middle of the ayacut lands on the foreshore to permit the flow of the water drained from the catchment above.

Food Value.—The gap of 106 acres in cultivation under the tank is expected to be bridged and the extent of 32 acres of lands on the foreshore will also be relieved of submersion. The total additional food production expected as a result of the work is 61 tons. The amount of estimate for the work is Rs. 19,000 and the rate per ton works to Rs. 311.

VI. CONSTRUCTING AN ANICUT ACROSS COOUM RIVER BELOW THE OFF-TAKE OF THE SUPPLY CHANNEL AYANAMBAKKAM TANK.

Estimate: Rs. 1,21,000

Ayanambakkam tank is situated in the Saidapet Taluk. It has a free catchment of 0.76 square miles and a combined catchment of 0.85 square miles. In addition to the run-off from the catchment, the tank receives a supply of about 173 cusecs through the supply channel taking off from Cooum. The ayacut of 663 acres under the tank is mainly dependent on the supply from the river. The Supply channel has also a direct ayacut of 68 acres. The ryots have been putting up a mud kondam across the river for tapping the available supplies through the channel. But during floods, the mud kondam was getting washed out, with the result, the supply to the tank was adversely affected and there was failure of crops. To overcome this difficulty, an anicut was constructed just below the off-take of the supply channel to the existing supply channel. The length of the masonry anicut is 380' and has its crest at 37.0 and is provided with dam stones up to 59.00. The anicut can discharge a flood flow of 10,800 cusecs. The head-slucice for the Ayanambakkam channel has a vent way of 4'x4' and is provided with screw-gearing shutters.

As a result of executing this scheme, the existing ayacut of 731 acres has been stabilised, and a new ayacut of 75 acres was also developed. The extra food value is reckoned to be 118 tons of rice.

VII. CONSTRUCTING A BED DAM ACROSS COOUM RIVER AT THE OFF-TAKE OF PARUTHIPATTU CHANNEL

Amount of Estimate: Rs. 67,000

The PARUTHIPATTU TANK has an independent ayacut of 360 acres and a joint ayacut of 530 acres with the Paruthipattu channel, taking off

from the Cooum. The storage in the Paruthipattu tank is insufficient to feed the needs of the ayacut even during years of normal rainfall. Consequently, the ryots have to depend mainly on the supply from the Cooum River. They were putting up a mud Kondam for about 4 feet height over the average bed level of 67.00 in the river to head up water up to 69.50 and to divert the flows into the channel. But the mud kondam was frequently getting breached after every floods in the river and the ryots were finding it difficult to reform the Kondam. The loss of supply between the time of breaching of the mud kondam and its restoration caused the failure of crops. To overcome the above difficulties and to give an assured supply of about 10 cusecs for the ayacut of 530 acres, a bed dam with dam-stones provided in it to head up water up to F.S.L. of 2.50 feet over the average bed of the river, was constructed. The anicut is located 3 miles above the Ayyanambakkam Anicut in the same river.

The bed dam is 288 feet long, and the top level of the dam stone is +69.50. This will head up water up to 69.50 so that the flow in the channel will irrigate the fields which are at a level of 67.50. The channel is $1\frac{1}{2}$ miles long and will draw about 10 cusecs at F.S.L. conditions.

The dam stones are fitted up with R.C. plank shutters of $1\frac{1}{2}$ " thickness and 2'—6" height over the bed level of 67.00.

The channel head is provided with a vent 3'—0" wide with sill at 66.00. A silt shutter is provided up to 67.00 level, to prevent the flow of silt during normal floods in the river. During the low flow season, the ryots can remove the silt shutter and take water even at low levels to feed the tailend lands. The vent is provided with T. W. needle shutters so that it may be closed during floods and whenever the ryots do not want water in the channel.

The Scheme saves the frequent troubles which the ryots are now put to in forming the mud dam after every floods, and gives an assured supply to the ayacut. This scheme therefore stabilises the ayacut of 530 acres and results in an additional foodgrain of 100 tons at the rate of $\frac{1}{5}$ ton per acre of existing ayacut.

The total cost of the bed dam and channel is Rs. 67,000.

VIII. MADAMBAKKAM TANK—RAISING THE F.T.L. BY 3 INCHES AND RECLAIMING THE SUBMERSIBLE FORESHORE LANDS BY DESILTING

Amount of Estimate: Rs. 24,300.

Madambakkam tank of Perumbakkam Tank Group in Kovalam Minor Basin is a T. R. S. investigated tank. Since its investigation by the T. R. S. Party, the tank had lost a portion of its capacity by silting.

The tank's capacity as per memoirs is 50 M.C. Ft. An inspection of the tank had revealed that the tank had silted up by 1 foot 8 inches opposite the lowest sluice. The tank had lost a capacity of 4.0 M.C.Ft. for each filling. The F.T.L. of the tank was therefore raised by 3 inches with a view to make good 2.75 M. C. Ft. in each filling.

There are about 16 acres of wet lands in the foreshore subject to submersion even at the original F.T.L. of 35.00, the depth of submersion varying from 0.85 to 1.85 ft. As the crops were getting damaged even by the present submersion, the levels of these foreshore lands were raised to the level of 34.75 so that the water at the new F.T.L. may stand only for a depth of 6 inches. This raising was done by desilting the tank bed with earth-movers and depositing the silt on the fore—shore lands.

As the tank bund was weak in many places, the bund was strengthened with the desilted earth.

By the execution of this Scheme, the submersion in the 16 acres of foreshore wet lands was avoided and the storage of 4.0 M.C.Ft. (for $1\frac{1}{2}$ fillings in a year) got by raising the F.T.L. would benefit 40 acres of lands by bridging the existing gap in cultivation. The food value of the scheme is 24 tons, i.e. ($\frac{1}{2} \times 16$ plus $\frac{1}{2} \times 40$) and the cost per ton is Rs. 1,014.

The details of the tank are also furnished below:—

Hydraulic details:

(a) Catchment free	..	..	..	..	1.70 sq. miles.
Catchment combined	..	..	..	..	2.37 sq. miles.

(b) *Capacity:*

As per Memoir	..	..	..	..	50 M.C.Ft.
As existing (silted)	..	..	..	..	46 M. C. Ft.
Annual storage ($1\frac{1}{2}$ fillings)	..	..	..	..	69 M. C. Ft.

(c) *Ayacut particulars:*

Registered ayacut in acres	..	..	..	..	640 acres
Gap in cultivation	..	..	..	..	40 acres.

(d) *Original standards*

F. T. L.	..	35.00
M. W. L.	..	37.00
T. B. L.	..	43.00
Side slopes	..	$1\frac{1}{2} : 1$

Standards after execution.

	..	35.25
	..	37.25
	..	43.25
	..	$1\frac{1}{2} : 1$

IX. PALLAVARAM NATTERI

Estimate: Rs. 7,800.

Registered ayacut	..	..	..	..	85.15 acres.
Average cultivation	..	..	..	..	53.01 acres.
Gap	..	..	..	..	32.14 acres.
Catchment—Combined	..	..	..	..	0.417 Sq. mile
Free	..	..	..	..	0.201 Sq. mile
Total yield	..	..	..	..	9.43 M. cft.
Annual storage capacity	..	..	..	..	7.071 M. cft.
Length of the bund including weir	..	..	..	..	3,000 Ft.
Additional food production	..	..	..	..	22.6 tons
Food value	..	..	..	..	Rs. 345 per ton

(1) This tank is situated in Pallavaram village of Saidapet Taluk. This is Zamin source taken over by the Government.

(2) *Condition of Tank prior to Repairs.*—The bund was in a bad state of repairs and below standards. Irrigation was carried on through one masonry sluice which was leaky and in a dilapidated condition. The tank had a calingula at the right flank which was in a dilapidated condition. There was a cut in the bund at L.S. 2700 through which carts were plying between Zamin Pallavaram and the Railway Station. Considerable amount of water was being wasted through the leaky sluice, calingula and the open cut. The ryots therefore were not able to store water in the tank.

(3) The special repairs to the tank were taken up in 2/57 and the estimate provisions are :—

- (i) Reconstruction of one sluice with masonry tunnel and wing type head wall.
- (ii) 128 units of earthwork for strengthening the tank bund.
- (iii) Construction of weir.
- (iv) Closing the open cut and forming a ramp for the cart track crossing.

All the works mentioned above have been completed, except for the final sectioning of the tank bund.

(4) As a result of the special repairs a gap of 32 acres is expected to be bridged and additional foodgrains to the extent of $(32/2 + 53.01/8)$ or 22.6 tons is expected to be produced. The rate per ton of additional foodgrains works out to Rs. 345.

X. THIRUVANCHERI THANGAL

Estimate: Rs. 7,300

Registered ayacut	..	..	..	..	81.80 acres
Average cultivation	..	..	..	..	51.09 acres
Gap	..	..	..	..	30.71 acres
Catchment	..	..	..	..	0.32 sq. mile
Total yield from catchment	..	..	..	..	12.38 M. Cft.
Annual storage capacity	..	..	..	..	9.2 M. Cft.
Length of bund including weir	..	..	..	..	2,700 ft.
Food production	..	..	..	..	21.73 tons
Food value	..	..	..	..	Rs. 336 per ton

(1) This tank is situated in Thiruvancheri village in Saidapet Taluk. This was a Zamin source taken over by the Government.

(2) *Condition of the Tank prior to Repairs*—The bund was below standards and eroded at a number of places. Much water was being wasted through the uneven N.G.E. and the open cuts through which water was being taken for irrigation by the ryot.

(3) The special repairs proposed for this thangal are :

- (i) About 140 units of earthwork for raising and strengthening the tank bund.
- (ii) Construction of 3 new sluices (one tunnel type and one pipe sluice) at open cuts.
- (iii) Construction of a bye-wash in lieu of an N.G.E.
- (iv) 60 units of revetment to tank bund.

All works are completed except 60 units of earthwork to tank bund.

(4) As a result of repairs to this tank, a gap of 30.7 acres will be bridged and food grains to the extent of $(30.71/2 + 51.09/8) = 21.73$ tons are expected to be produced. The food value works out to Rs. 336 per ton.

NOTE : N.G.E. Natural Ground Escape.

XI. DESILTING-CUM-RECLAMATION OF NANDIVARAM TANK IN CHINGLEPUT TALUK

Estimate : Rs. 23,000

(Work is in Progress)

NANDIVARAM HISSA TANK lies in Adayar Minor Basin.

(2) The following are the details about the tank :—

Catchment—free	4.62 sq. miles.
Combined	8.99 Do.
Yield from catchment—	177 Million cubic feet.
Capacity : As per memoir :	59.7 M. Cft.
Present silted capacity	51.6 M. Cft.
Capacity proposed in million cubic feet :	58.3 M. Cft.
Annual storage:	117 M. Cft.

(3) *Cultivation particulars :*

Registered ayacut	839 acres
Average cultivation	599 acres
Gap in cultivation	240 acres
Foreshore lands under submersion	20 acres

(4) *Present standards :*

F.T.L. .. 57.2	57.70
M.W.L. .. 59.20	59.70
T.B.L. .. 65.20	65.70
Top width .. 6' + 4½'	10'

*Revised standards
after execution*

(5) *Proposals under D.C.R.*—The present silted capacity of the tank is 51.6 M.Cft. against 59.7 M. Cft. as designed in the memoir. To make good the lost capacity, the F.T.L. of the tank is being raised by 6" and the capacity of the tank is restored to 58.3 M. Cft. The foreshore wet lands are now under submersion to an extent of 20 acres for the existing F. T. L. of 57.20. The level of these lands is being raised so that there may be a submersion of only 6" for the proposed F.T.L. conditions. The bunds will be brought to the altered standards and the top width widened to 10'. The repairs to the bund also will be done by the earthmoving machines.

(6) *Food Value.*—A gap of 120 acres in the registered ayacut will now be irrigated, and 20 acres in the fore-shore will be relieved of submersion.

$$\text{Food value in tons} = \frac{120}{2} \text{ plus } \frac{20}{4} = 65.$$

$$\text{Cost of the scheme} = \text{Rs. 23,000}$$

$$\text{Rate per ton} = \text{Rs. 354.}$$

APPENDIX XV

GOVERNMENT OF MADRAS
The Fort St. George Gazette, Madras
Wednesday, March 16, '55.

Part IV. B. Madras Acts, Regulations etc.

NOTE : Rules issued by the Government of Madras under the Acts are published as "Rules Supplements" to different parts in the same size as this part for facility of filing and are placed separately for sale or for being subscribed for separately.

CONTENTS

Acts :

The following Act of the Madras Legislature received the assent of the Governor on the 4th March, 1955 and is hereby published for general information.

Act No. III of 1955

AN ACT TO PROVIDE FOR THE LEVY OF BETTERMENT CONTRIBUTION OF CERTAIN LANDS IN THE STATE OF MADRAS.

WHEREAS it is expedient to provide for the levy of betterment contribution on certain lands in the State of Madras.

Be it enacted in the sixth year of the Republic of India as follows :—

1. Short title and Extent : This Act may be called the Madras Irrigation Levy of Betterment Contribution Act, 1955.

2. It extends to the whole of the State of Madras.

3. *Definitions* :—In this Act, unless there is anything repugnant in the subject or context.

1. Contribution means the betterment contribution referred in Section 3.

2. Drainage work includes;

(a) Channels, whether natural or artificial, for the discharge of waste or surplus water and all works connected with or auxiliary to such channels;

(b) escape channels from an Irrigation work ;

(c) Dams, weirs, embankments, sluices and groynes;

(d) all works for the protection of lands from floods or from erosion which are owned or controlled by the Government, or which are maintained by them or otherwise than by an assignment recognised by the Government, or which having been constructed by the Government or being maintained by an assignment of lands or landrevenue as aforesaid, have not been made over to any person, but does not include works for the removal of sewage.

3. 'Government' means the State Government.

4. 'Irrigation work' includes.—

- (a) all canals, channels, tanks, wells, reservoirs, ponds spring ponds and madugus used for the supply or storage of water and all works, embankments and structures (Other than escape channels) connected therewith or auxiliary thereto, which are owned or controlled by the Government or which are maintained by them otherwise than by an assignment of land or land revenue made, confirmed or recognised by the Govt. or which, having been constructed by the Government or being maintained by an assignment of land or land revenue as aforesaid, have not been made over to any person.
- (b) all such lakes and other natural collections of water or parts thereof as are situated on lands which are the property of Government.
- (c) all rivers and natural streams or parts thereof.

5. 'Land holder' in relation to any land means the persons liable to pay the public revenue due on the land.

Provided that :

- (a) in respect of any land comprised in the holding of a Kadamadar or a customary Revumpattamdar in the territory to which the Malabar Tenancy Act, 1929 (Madras Act XIV of 1930) extends the Kanamdar or the customary Verumpattamdar, as the case may be and
- (b) in respect of any land in the possession of a Walawargadar, a Kayemgenidar, a Permanent tenant or a Mulgeni tenant in the South Kanara District, such Walawargadar, Kayemgenidar, Permanent tenant or Mulgeni tenant, as the case may be, shall be deemed to be the landholder in respect of such lands.

6. Notification means a notification published in the Fort St. George Gazette.

7. Prescribed means prescribed rules made under this Act.

8. 'Work' means an irrigation or drainage work.

3. *Levy of betterment contribution.*—The Government shall be entitled to levy a betterment contribution, in accordance with the provisions of this Act, from the landholder of any land which, in their opinion, is benefited by the construction, expansion or alteration by the Govt. whether after the commencement of this Act, or at any time before such commencement but not earlier than the 1st January, 1947 of any work (including the installation by them of a pumping set, the cost of which exceeds twenty five thousand rupees).

Explanation I.—A land shall be deemed to be benefited notwithstanding that the benefit is not enjoyed provided such non-enjoyment is due solely to action or inaction on the part of the person or persons interested in such land.

Explanation II.—A land shall not be deemed to be benefited merely by reason of the maintenance of an existing work wholly or partly at the expense of the Government.

4. *Amount of betterment contribution.*—(1) The lands benefited by the construction, expansion or alteration of any work shall be divided into suitable classes by the Govt. and the annual increase in the gross produce of each class of lands shall be estimated.

Provided that all lands which are of the same Taram and which judged by their commandability are so situated as to derive the same amount of benefit from the work shall be placed in the same class.

Provided further that the estimate shall be made with reference to average of the prices prevailing in the case of a work whose construction, expansion or alteration was completed before the commencement of this Act, during the three years immediately preceding such commencement and in the case of a work whose construction, expansion or alteration was completed after the commencement of this Act during the three years immediately preceding such completion.

Provided also that the average aforesaid shall not exceed three times the price which prevailed in August, 1939.

2. Ten times the annual increase in the gross produce estimated under sub-section (1) shall be deemed to be the increase in the capital value of each class of lands and the contribution payable in respect of such class of lands shall be one half of the difference between the said increase in the capital value and the cost (estimated in the prescribed manner) of making the lands fit for advantageous irrigation under the work.

Provided that in the case of lands which were originally under dry cultivation and which with a view to derive benefit from the work, were brought under wet cultivation, a sum representing the difference between the cost of wet cultivation and the cost of dry cultivation as determined in the prescribed manner shall be deducted from the increase in gross produce for the purpose of calculating the increase in capital value of those lands.

3. The contribution payable in respect of each class of lands expressed in terms of rate per acre shall be notified in the District Gazette and in such other manner if any as may be prescribed.

Provided that the officer authorised in that behalf shall, before determining the contribution under the foregoing provisions of this section, publish his proposals in the prescribed manner and shall consider suggestions and objections received within the time allowed.

Provided further that against a decision with respect to contribution under the foregoing provisions of this section, an appeal shall lie to the prescribed authority and any modification made on such appeal shall be notified in the prescribed manner.

4. Decisions with respect to contribution notified under sub-section (3) shall subject to the right of appeal provided in the said sub-section be final, shall be binding on all persons having interest in the lands and shall not be liable to be questioned in a Court of Law.

5. At the end of every four years from the year in which the contribution is finally determined under sub-section (3) any future instalment of such contribution shall be liable to be revised on the basis of the proportion that the average of the prices prevailing during those four years bears to the actual or assumed average of prices on the basis of which the contribution was determined.

5. *Contribution recoverable as arrear of Land Revenue.*—Contribution payable under this Act in respect of any land shall be deemed to be public revenue due upon the said land, and the land, its products and the buildings owned and occupied by the landholder, standing upon the land shall be regarded as the security of the contribution. When the whole or portion of an instalment of the contribution payable in any year is not paid on the due date, the amount of the instalment or its unpaid portion shall be deemed to be an arrear of land revenue and the provisions of the Madras Revenue Recovery Act, 1864 (Madras Act II of 1864) and of the Madras City Land Revenue Act, 1851 (Central Act XII of 1851) as amended by the Madras City Land Revenue Amendment Act, 1867 (Madras Act VI of 1867) shall apply to the recovery of the said arrear as they apply to the recovery of the revenue due on the land.

6. *When contribution becomes payable.*—(1) Contribution shall become payable under this Act on a written notice of demand therefor issued by an officer authorised by the Government in this behalf being served on the landholder.

Provided that no such notice shall be served until the expiry of two years after the date of completion of the construction, expansion or alteration of the work.

Provided further that where, before the commencement of this Act, two years or more have elapsed from the date of completion of the construction, expansion or alteration of the work, such notice may be served at any time after such commencement.

2. For the avoidance of doubt, it is hereby declared that it shall not be necessary to serve notice on any person other than the landholder who has an interest in the land or on a successor in interest of the landholder or in respect of any instalment of the contribution.

3. For the purposes of this section and section 4, the construction, expansion or alteration of a work shall be deemed to be completed on the date of cessation of all work connected with its construction, expansion or alteration or on the date when the work is ready to be put in actual operation whichever is later.

7. *Mode of payment of Contribution.*—(1) The contribution payable by a landholder shall be paid by him in twenty instalments.

Provided that he shall be entitled to pay the entire contribution with a rebate of twenty per cent within a period of two years from the date on which he becomes liable to pay the contribution.

(2) Arrears of instalments of the contribution shall bear interest at the rate of six per cent per annum and such interest shall be recoverable as arrears of land revenue.

8. *Rebate in certain cases.*—If the Government accept any money from any person for the construction, expansion or alteration of any work and such person becomes liable to pay contribution in respect of any land benefited by such construction, expansion or alteration, the sum accepted from him shall be credited towards the contribution payable by him.

9. *Payment of contribution by person having interest in land.*—Any person having interest in a land may, notwithstanding that he is not the Landholder of such land, pay the contribution payable by the landholder in respect of such

land and shall, if such person pays the entire contribution within a period of two years, from the date on which the landholder becomes liable to pay the contribution, he is entitled to a rebate of 20 per cent.

10. *Right of reimbursement in respect of contribution.*—Where the landholder not being in the territory to which the Malabar Tenancy Act, 1929 (Madras Act XIV of 1930) extends a Kanamdar or a customary Verumpattamdar, or in the South Kanara District a Walawargadar, a Kayamgenidar, a Permanent tenant or a Mulgeni tenant liable to pay contribution under this Act is not the owner of the land or is a co-owner of the land, nothing in this Act, shall be deemed to affect his right to reimbursement from the owner or to recover proportionate part from the co-owner as the case may be.

11. *Apportionment of contribution.*—Where a landholder whose case is not covered by section 10 and who has paid an instalment of contribution under this Act, is not the occupier of the land, he shall, in the absence of a contract to the contrary be entitled to recover the amount of such instalment from the person who is in actual occupation of the land during the year in which the said instalment is payable.

Provided that, here such person is a tenant, the landholder shall be entitled to recover from the tenant the instalment of contribution referred to in this section only if the tenant is liable under any law or custom of the locality to deliver to the landholder a share of the produce and such share has not been altered subsequent to the completion of the work by agreement between the parties and the amount that can be recovered from such a tenant shall bear to the total amount of the instalment the same proportion as the tenant's share of the produce bears to the total produce of the lands.

Provided further that, where the landholder has paid the entire contribution with a rebate under the proviso to sub-section (1) of section 7 a twentieth part of the sum actually paid shall be deemed to be the instalment of the contribution payable during every year during which an instalment of the contribution would have been payable and the entire contribution not been so paid.

12. *Exemption.*—If, in the opinion of the Government the enforcement or strict enforcement of all or any of the provisions of this Act, will cause hardship in any case or cases, the Government may by notification setting out the ground therefor, exempt either permanently or for a specified period such case or cases from all or any of the provisions of this Act, subject to such conditions, if any, as the Government may deem fit to impose.

13. *Power to make Rules.*—(1) The Government may by notification make rules to carry out the purposes of this Act, and in particular,—

- (a) for the delegation of their powers to the Board of Revenue, Collectors or other authorities;
- (b) for the provision of such appeals and revision as may be found necessary in respect of the orders passed by any authority to whom powers may be so delegated;
- (c) for the manner of estimating the gross produce and prices under section 4; and
- (d) for all matters expressly required or allowed by this Act to be prescribed.

2. All rules made under this section shall be published in the Fort. St. George Gazette and upon such publication shall have effect as if enacted in this Act. Those rules so made shall be placed on the table of the Legislative Assembly as soon as possible after they are published and shall be subject to such modifications, whether by way of repeal or amendments as the Assembly may take within fourteen days during the session in which they are so laid.

14. *Savings.*—Nothing contained in this Act, shall apply to the levy determination payment or recovery of betterment contribution from the landholders of lands which are benefited, or are capable of being benefited by the construction, expansion or alteration of any work, if provision in that behalf is contained in any other law relating thereto and for the time being in force.

APPENDIX XVI

**Table showing Evaporation Losses in Inches in Madras State*

	Pamban	Madura	Nega- patam	Coim- batore	Salem	Madras
January	6·11	6·14	5·21	3·63	4·96	3·26
February	6·50	6·36	6·89	4·40	6·08	3·19
March	7·75	8·53	6·36	5·98	8·49	4·68
April	7·23	8·58	5·58	5·70	8·97	5·16
May	8·77	11·16	6·91	5·67	7·84	8·31
June	10·11	11·76	9·27	6·63	7·08	10·59
July	9·61	11·12	8·06	6·48	6·08	7·41
August	8·28	9·24	6·01	5·55	5·33	5·36
September	7·59	7·62	5·07	4·68	4·77	4·59
October	5·92	5·33	4·12	3·38	3·84	3·41
November	5·10	4·71	4·02	2·58	3·33	3·48
December	5·43	5·18	5·21	3·04	4·06	3·94
TOTAL	88·40	95·73	72·71	57·72	70·83	63·38

*Vide Scientific Notes-Vol. VI. Nos. 61-68
India Meteorological Department.

APPENDIX XVII

Statement showing Observations and Recommendations of the Minor Irrigation Team alongwith Comments of the Government of Madras and the Ministry of Food and Agriculture, Government of India.*

Serial No.	Paragraph No. of the Summary	Summary of the recommendations of the Team	Comments of the Government of Madras
1	2	3	4
1	1	The Tank memoirs including those of the Zamin tanks may be brought upto date.	Proposals for a comprehensive survey are under examination.
2	2	The spillway-design-practices are thoroughly reviewed and steps taken to provide on all new tanks, adequate waste-weir capacities computed from detailed storm studies, adopting unit hydrograph method.	The recommendation will be got looked into by the engineering experts in this State.
3	3(i)	Replacing the earthen bunds now being put every season across the streams by masonry anicuts with scouring sluices.	The suggestion will be put to the Chief Engineer (Irrigation) and the Superintending Engineer (Food Production) to take up as many schemes of the kind as possible subject, of course, to the rules of financial and economic limits of propriety.
4	3(ii)	Providing regulators for the supply channels.	The suggestion will be put to the Chief Engineer (Irrigation) and the Superintending Engineer (Food Production) for adoption, wherever necessary.
5	3(iii)	Maintaining the tanks on the same basis as Government buildings or roads which are regularly repaired every year.	The annual maintenance of system tanks is already being done by the P.W.D. In respect of non-system tanks, the Revenue Department is in-charge. The question of entrusting annual maintenance of these sources to the village Panchayats is under examination in connection with the implementation of the new Panchayats Act, 1958.
6	3(iv)	Entrusting tank repair work to village Panchayats where they exist, so that small damages caused to bunds during Monsoon or otherwise may be made good immediately.	

* Comments of the Ministry of Food and Agriculture are at page—88.

APPENDIX XVII—contd.

1	2	3	4
7	3(v)	Adopting Specification 20-A for the entire length of bund.	} The suggestions will be looked into.
8	3(vi)	Providing turfing for the earthen bunds in accordance with Specification No. 22.	
9	3(vii)	Bringing old Zamindari tanks which have been neglected for a number of years in line with the rest of tanks in the State.	
10	3(viii)	Keeping feeder channels in proper shape in order to improve the utility of river fed tanks.	Special attention is being paid to the renovation of ex-Zamindari sources. See also reply under item 1 above.
11	4	The Team recommends providing regular water courses in the ayacut of the tanks as the present mode of passing water from one field to another is extremely wasteful.	The suggestion is already being implemented in this State.
12	5(i)	Desirability of installing filter points inside a bored hole in preference to driving it into position.	The distributaries upto 50 acres and in some rare cases upto 25 acres are excavated at Government cost and development of ayacut does not suffer in new projects on this account. A Bill for the purpose of construction of field bodhies at State cost in first instance, recovery of cost being affected from the beneficiaries subsequently, is under consideration.
13	5(ii)	Necessity to coordinate the functions of Revenue and Agriculture Departments.	This system is followed in this State. The filter points are not driven into position but placed into position in a bore hole and the lining pipes are later on withdrawn.
14	5(iii)	Limiting lift irrigation to places where ample water is available for at least 200 days in a year so as to avoid over capitalising which has proved a serious handicap so far.	There is ample co-ordination in this State as the District Collector is the head of all the developmental activities and the District Agricultural officer is more or less a technical assistant to the Collector in the field of agriculture.
15	6	Wherever response from the villagers to take up the works on contract is not forthcoming, the Team suggests grouping the repairable tanks within a reasonable distance from one another and giving out contracts costing Rs.50,000 or more to contracting firms, having finance and equipment and command of labour.	The suggestion will be kept in view while planning schemes of the kind in future.
			This suggestion will be implemented to the extent feasible.

APPENDIX XVII—contd.

1	2	3	4
16	7	The estimates in respect of the works under the D.C.R. Scheme may be modified so as to reclaim Peramboke lands under the tanks according to a phased programme and included in the Third Five Year Plan.	The suggestion is acceptable. In respect of the experimental works completed in Chingleput district, it has been found that the reclaimed lands have generally been brought to cultivation. A modified scheme serving the twin objectives of desilting and planting of green manure and fodder crops and fuel trees etc., is being formulated in this State. It is proposed to try the desilting-cum-plantation scheme also as an experimental measure, leaving the final shape in which the scheme should be extended to be decided at a later date.
17	8	Rules under the Betterment Contribution Act passed in March, 1955 may be formulated and implemented without further delay.	Certain practical difficulties have come up while implementing the provisions of the Act and the question of simplifying the procedure is under consideration.

30694

88

APPENDIX XVII—concl'd

Krishan Chand, ICS,
Joint Secretary

D. O. No. A/A-PA/49
Government of India
Ministry of Food & Agriculture
(Department of Agriculture)
New Delhi,
November 18, 1959.

My dear Borker,

Please refer to your letter No. COPP/25/59/1925, dated 29th October 1959, addressed to Shri Damle. We have gone through the draft Report on Minor Irrigation works in Madras State submitted by the Minor Irrigation Team and have no comments to make.

Yours sincerely,

Sd/- Krishan Chand.

Shri D. S. Borker,
Secretary, Consultative Committee,
Irrigation & Power Projects,
Committee on Plan Projects,
Krishi Bhavan,
New Delhi.



M10PC—2000—19-12-59—GIPF