Government of Madras

PUBLIC WORKS DEPARTMENT

(Irrigation)

G.O. No. 785, 20th April 1938

Irrigation—Tinnevelly-Papanasam scheme—Irrigation aspects—Papers recorded.

READ—the following papers :—

I

Memorandum by the Tinnevelly District Landholders' Association, to the Hon'ble the Minister for Public Works, dated 5th October 1937.

Papanasam reservoir.—The Government has in G.O. No. 1286 I., dated 29th May 1936, sanctioned the detailed investigation of a hydro-electric scheme at Papanasam and has directed that in making the investigation the requirements for irrigation purposes should also be taken into account.

The investigation is almost complete and the report by the Chief Engineer for Electricity is likely to come up before the Government for orders shortly.

The association urges upon the Government that in view of the irrigation interests in the Thambraparni valley to be served by the project in addition to its supreme value for industrial and agricultural development the scheme should be included in the next budget.

It is well known that the existing irrigation system is quite defective and unable to serve the entire ayacut properly, especially in its lower reaches. The ayacut, however, bears an assessment based on a theory of an adequate and never-failing supply. This theory is being frequently falsified by the almost general failure of the kar crop in the lower section served by the Marudur and Sriyaikuntam anicuts and occasional failure in portions higher up. The annual loss to the ryots caused by such failure amounts to several lakhs of rupees. These failures are not revealed by the figures of the remission of revenue, as under the rules, the lands under the Thambraparni system are assessed at a compounded rate for both the crops and no remission is granted even where there is a total failure of the kar crop and a comparatively poor crop in pisanam. In spite of the defective water-supply, the ayacut bears an average assessment of Rs. 12–15–6, which is more than double the Presidency wet average of Rs. 6–6–0 and nearly double the figure for everyone of the major river systems such as the Cauvery, the Godavari, or the Kistna. The annual gross income from the ayacut is Rs. 9·86 lakhs. Deducting interest charges and working expenses of the only two anicuts on which capital expenditure has been incurred the net revenue is as high as Rs. 8 lakhs.

Admittedly, the hydro-electric scheme is remunerative by itself. Its utility is enhanced by its likelihood to improve the existing defective supply to the Thambraparni ayacut with its annual net revenue of Rs. 8 lakhs.

The association therefore prays that the hydro-electric project, which is now ripe for execution may be sanctioned and proceeded with expeditiously.

There remains the question of providing additional storage facilities that may be possible and required from the irrigation point of view. The association submits that this matter should not be lost sight of, but reserved for separate consideration as early as may be practicable. Here the association would emphasize the duty of the Government to the ryots to give them adequate irrigation facilities to cultivate efficiently the existing ayacut of the river system and would express their disappointment at the very narrow view expressed by the last Government on the irrigation part of the scheme in paragarph 2 of G.O. No. 1286 I., dated 29th June 1936.

2. *Tank restoration scheme.*—A copy of the memorial submitted by the association on this topic is attached herewtih and may be taken as part of the memorandum. The Association prays that the tank restoration scheme work may be resumed in the whole Presidency and particularly in the Tinnevelly district, where it was arrested at an early stage by its suspension in 1931.

3. *Kudimaramat.*—The working of the kudimaramat system in Madras was examined by the Indian Irrigation Commission of 1901–03. The Commission recognized the difficulty of enforcing kudimaramat in the case of long canals supplying several villages (Part II, paragraph 268 of the report). Such canals are beyond the scope of the kudimaramat principle which can at best be requisitioned for an irrigation work that pertains only to a single village. The Commission has also found that kudimaramat has almost ceased to exist (Part II, paragraph 269 of the report).

4. The executive rules as to kudimaramat in Madras as set out in Board's Standing Order No. 86 (5) ignore the above principle enunciated by the Commission as well as the real condition of the kudimaramat institution as found by it. As per Board's Standing Order No. 86 (5), " in most districts, this customary labour (or kudimaramat) will include the following :— . . .

(*b*) To keep in order the supply channels or tanks to such extent as is sanctioned by local custom . . .

(8) To construct ring-dams at breaches . . ."

There are a large number of supply channels of lengths up to nearly 15 *miles*, and in some cases even above this figure in which silt clearance is said to be kudimaramat work in the Tinnevelly district. The obligation to construct ring-dams at breaches is sought to be enforced at Tinnevelly even in the case of big canals maintained by the Public Works department. The practice in other districts is presumably similar. Silt clearance or ring-dam construction in long canals serving more than one village is clearly outside the scope of the kudimaramat as enunciated by the Irrigation Commission. Apart from the weight of the Commission's authority, it is obvious that kudimaramat ought not to be extended to a case of a co-operative effort of more than one village. The enforcement of an unnatural rule leads necessarily and logically to serious hardship to the ryot.

5. The principle of kudimaramat should be confined to irrigation or drainage works that serve only single villages. Silt clearance and construction or ring-bunds as well as the other duties specified in Board's Standing Order No. 86 (5) should not be applied to any work that serves more than one village.

Enclosure.

Memorial from the Joint Secretaries of the Tinnevelly District Landholders' Association to the Hon'ble the Minister for Public Works, dated 4th August 1937.

The Association has passed the following resolution on 22nd July 1937 :—

Restoration of tank restoration scheme works.—The association is strongly of opinion that the tank restoration scheme work that was suspended in 1931 on the ground of retrenchment should be restored, in view of its undoubted necessity and value for purposes of irrigation. It urges that the tank restoration scheme work should be revived and a five years' programme should be laid down for its completion.

2. The Government of Madras gave the following reply on 17th March 1933 in answer to a similar request. " It is desirable that the operations when once resumed, should be continued, without a break for some years, in order to complete the balance of work to be done; otherwise, there is bound to be waste of time and labour. Although there has been some improvement owing to the stringent measures of retrenchment adopted in the financial position of the province, the maintenance of the improved position is still too uncertain to justify the resumption of operations with a reasonable certainty that they can be carried on without interruption for a sufficiently long period."

3. The tank restoration scheme was started in 1883 as a result of the report of the Famine Commission of 1878 which recommended a systematic treatment of minor irrigation works " which were recognized to be below their state of full efficiency and incapable of effecting their proper amount of irrigation." The Irrigation Commission of 1901 made a full examination of the progress of the tank restoration scheme work made till then and have said that " we strongly recommend that the work of tank restoration should be rigorously prosecuted. We think that an annual expenditure on the works of not less than Rs. 26 lakhs which is less than one-fourth of the total revenue should be contemplated of which about half would be available for investigation and restoration work which should then be completed within 15 years."

4. The total expenditure incurred on the tank restoration scheme work for 15 years before it was suspended in 1931 is only Rs. 47 lakhs at an annual average of Rs. 3¼ lakhs. The annual revenue accruing from the lands within the scope of the tank restoration scheme policy is Rs. 140 lakhs. The tank restoration scheme policy comprises in its ambit 35,708 public irrigation works, big and small, irrigating 26 lakhs of acres, forming 40 per cent of the total area under State irrigation works in the Presidency.

5. Thus a scheme initiated in 1883 on the report of the Famine Commission to serve a large portion of the irrigation interests of the Presidency and strongly supported by the Irrigation Commission of 1901 and recommended by that body to be completed in 15 years has been suspended indefinitely from 1931 onwards.

6. The resumption of this work is long overdue and is urgently necessary to enable the irrigation works to function properly.

7. Moreover, as pointed out by the Irrigation Commission, it would be false economy to delay or discontinue the tank restoration scheme work, because the ordinary repairs would then have to be " carried on without system and the annual outlay would steadily rise."

8. The lands under the tank restoration scheme works are held under the ryotwari tenure. It is a vital term of this tenure that the State which gets half the net income should maintain the irrigation works in an efficient condition.

9. In view of the severe agricultural depression, the agriculturist who is seriously prejudiced by the suspension of the tank restoration scheme is entitled to special consideration and to a first charge on the State's revenue for the redress of his grievances.

10. The total cost of the remaining tank restoration scheme work is estimated by Government at Rs. 38 lakhs on one basis and Rs. 63 lakhs on another basis (vide Public Works Department Administration Report, 1930–31). If it is taken roughly at a central figure of Rs. 50 lakhs a five years' programme may be adopted for completing the work begun in 1883. An annual allotment of Rs. 10 lakhs for five years out of an annual revenue of Rs. 140 lakhs from the works is only a fair request.

11. Some districts are affected more than others on account of this suspension in 1931. The proportionate area in the Tinnevelly district yet to be touched by the tank restoration scheme investigation is 51·6 per cent as against only 14·5 per ecnt for the whole Presidency. The situation is rendered worse in Tinnevelly by the fact that the proportionate area within the scope of the tank restoration scheme works, is 81 per cent as against 42 per cent for the whole Presidency. Another relevant factor for the Tinnevelly ryot is that in spite of the neglect of his irrigation work his land has to pay the heaviest tax.

12. In the circumstances it is prayed that Government may be pleased to order the resumption of the tank restoration scheme work and to adopt a five years' programme for its completion.

II

Memorandum submitted by the landholders of the Srivaikuntam and Tiruchendur taluks, dated 9th September 1937.

[The Papanasam Reservoir Project.]

The Thambraparni valley receives a total annual rainfall of 27 inches and its total rainfall during the south-west monsoon from June to September is as low as 3 inches. There are more than 70,000 acres of double-crop wet lands under the irrigation of Thambraparni river and in order to avoid the drought caused by the vagaries of the monsoon, a reservoir at Papanasam should necessarily be constructed. Even so early as in 1854, Engineer Captain Horsley wrote that it was " Perfectly practicable to construct a reservoir at Papanasam and if one was constructed a very large extent of wet cultivation could be saved from drought and it would be a profitable thing to Government if one was constructed." Since then various Engineers and Collectors have written recommending the project for the favourable consideration of the Government.

2. The project should be considered as a protective work and not solely as a productive work and the Government should construct the reservoir without in any way increasing the assessment for the following among other reasons :—

(*a*) This project is pre-eminently for the benefit of the lands under the Marudur and Srivaikuntam anicuts. The capital expenditure up to 1930–31 for Marudur anicut is Rs. 51,721 and the total income per year from the lands under the Marudur anicut system is Rs. 2,40,000 and of this, the amount credited to Irrigation Revenue is Rs. 97,000 and odd. There is a total accumulated net profit of nearly 38 lakhs under this head. The only anicut that the Government has built in this district is Srivaikuntam anicut. The capital expendtiure on the anicut is Rs. 16,67,500 and the total revenue is Rs. 2,80,000 and of this, a sum of Rs. 1,64,000 is credited to Irrigation Revenue. The total accumulated net profits in this anicut is nearly 6 lakhs of rupees. Thus there is a net profit under the two anicuts of nearly forty-four lakhs of rupees. The net savings are bound to increase more and more hereafter, as the bunds have now been properly strengthened and the annual recurring expenditure will be much less hereafter. The amount that is now required is only 10 lakhs and this amount could be spent out of the accumulated net savings.

(*b*) When Srivaikuntam anicut was constructed, the Government held out very exaggerated hopes about the utility of the anicut with the result that a very large area was brought under wet cultivation at the time of the first settlement in 1873. Then it was found that Srivaikuntam anicut was a failure. The causes of the failure of the anicut are stated to be—

(i) Over-sanguine hopes of the inexhaustible resources of Thambraparni river.

(ii) *Misleading calculations.*—Calculations not ranging for sufficiently long period.

(iii) Enormous increase in the extent of cultivation in the upper anicuts and in Srivaikuntam anicut system.

While in 1860, the extent of cultivation in the seven upper anicuts was 76,204 acres, after the construction of the anicut, the extent was increased to 102,731 acres. Thus there was an increase in the extent of cultivation by nearly 35 per cent in the upper anicuts alone. After the construction of Srivaikuntam anicut, the extent of double-crop cultivation under that system was trebled and the extent of single-crop cultivation was nearly doubled. Thus by the construction of Srivaikuntam anicut, the landholders of the lands under that system were assured of an abundant supply of water for the extensive lands which were converted into nanja and *whose assessment was fixed at a high rate in the settlement.* The lands, after the construction of the anicut, did not get the water-supply as originally calculated and the supply usually received was diminished by the increased cultivation under the upper anicuts. The Government is therefore bound to give the landholders a proper supply of water to the lands under Marudur and Srivaikuntam anicut system and this can be ensured only by the construction of a reservoir at Papanasam. By constructing the reservoir, the Government is merely doing bare justice which is long over due.

(*c*) The Government gets a return of 8·25 per cent for the money spent on Srivaikuntam anicut. The money that is now needed for the project is only 10 lakhs. This project may be considered as a necessary complement to Srivaikuntam anicut and even if the expenditure is tacked on to the sum already spent over Srivaikuntam anicut, the return over the aggregate sum will work up to more than 5 per cent which is much more than the current rate.

(*d*) The ryots in this district have got the unenviable lot of paying the heaviest assessment on their lands and if the present assessment is increased in however small a degree, it will be very difficult for them to shoulder the increased burden.

3. Mr. Pennington, a former Collector of this district, wrote to the Government about this project as follows :—

> "It is not the direct pecuniary gain to Government by such improved irrigation that is the measure of its value. Government gets revenue all the same from land, the assessment of which has been compounded for two crops, even though the second crop may have failed and the ryot has lost half his rent. Such projects ought not to be made contingent on the direct benefits to Government alone. *It should be considered that Government cannot fail to benefit also by the increased prosperity of the people though it may be impossible to estimate such direct returns in figures.* There is one satisfactory feature about all irrigation schemes in this district and that is *the extraordinary enterprise of the people.* Only provide water and the people will do the rest."

Half a century has gone by since Mr. Pennington wrote the above letter and we are still in the same position. The people do not get any profit now by their extraordinary enterprise because of lack of sufficient supply of water, but the Government gets its full revenue so much so that the people are fast losing their faith in agriculture. In every village, we see instances of many leading agricultural families getting impoverished in spite of their enterprise and energy.

4. The recent G.O. No. 286, Irrigation, dated 29th May 1936, issued by the Government ordering detailed investigation of the hydro-electric scheme alone and abandoning the irrigation scheme as unproductive has caused great disappointment to the landholders in this district. It is stated in the Government Order that according to the revenue forecast of the Board of Revenue the return on the capital outlay of the irrigation part of the scheme is 2·65 per cent or 1·81 per cent according as the estimate of the Chief Engineer for Irrigation or the Chief Engineer for Electricity is adopted. It is submitted the revenue forecast is very conservative and in making the forecast, the authorities have not

taken proper account of the possibilities of the scheme. In Srivaikuntam taluk alone, the Revenue Department expected a revenue of Rs. 42,000 under the following heads as a result of this project :—

	Rs.	A.	P.
Dry to wet single-crop	4,437	14	0
Single wet to double-crop	8,803	13	0
Change in classification	28,753	10	0
	41,995	5	0

A similar forecast is likely in Tiruchendur and Tinnevelly taluks. Anyway the project is sure to be remunerative and is bound to yield a good return on the irrigation part of the capital.

5. On the basis of Rs. 10 lakhs being the irrigation part of the capital, calculating at 4 per cent, the interest amounts Rs. 40,000. The additional irrigation revenue for the project is, as per the forecast of the Board of Revenue, Rs. 27,000 nearly. There is thus a deficiency of Rs. 13,000. At the rate of 4 per cent if the amount is capitalized it will come to Rs. 3 lakhs and odd. The project is undoubtedly beneficial to the whole system. The total irrigated area is 70,000 acres for the Thambraparni system. If each acre is made to contribute Re. 1 per year for five years, this amount could be realized.

6. This year, the whole area under the system except a few rare exceptions is bound to wither for the want of one or two wettings, and the loss that will be caused to the landholders is nearly 50 lakhs of rupees. The rules of remission are so strict for compounded double-crop land that no remission is given even if one crop is totally lost. So the figures in the remission account do not give any correct idea regarding the loss sustained by the landholders owing to insufficiency of water. For the last ten years, most of the lands under the Marudur and Srivaikuntam anicut systems have not been cultivated in the kar season and in respect of those that are cultivated the crop is a very poor one. This will be borne out by the cultivation accounts maintained by the Revenue Department. It is needless to point out that the average Thambraparni assessment is double the Presidency average.

7. It is therefore respectfully submitted that the Government be pleased to reconsider their order (Government Order, dated 29th May 1937) and carry out the irrigation part of the project also.

III

Official Memorandum No. 2838-E/37-1, P.W D., dated 8th October 1937.

[Report on the Papanasam hydro-electric scheme. *Reference.*—From the Chief Engineer for Electricity, No. 12273/37-5-1, dated 28th August 1937.]

When submitting to Government printed copies of the report on the Papanasam hydro-electric project, the Chief Engineer for Electricity is requested to send copies simultaneously to the Chief Engineer for Irrigation, the Board of Revenue and Irrigation Development Board.

2. The Chief Engineer for Electricity has stated that the provision made for irrigation requirements and the hydraulic lay-out are being checked by the Chief Engineer for Irrigation. The Chief Engineer for Irrigation is requested to expedite his remarks and forward them through the Board of Revenue and Irrigation Development Board and also send copy to Government direct.

3. On receipt of copies of the report on the project the Board of Revenue and the Irrigation Development Board are requested to have a preliminary examination made urgently so that their views may be forwarded to Government without delay soon after the receipt of the remarks of the Chief Engineer for Irrigation.

W. Scott Brown,
Secretary to Government.

To the Chief Engineer for Irrigation.
" Chief Engineer for Electricity.
" Board of Revenue.
" Irrigation Development Board.

IV

Official Memorandum No. 3436-D/37-1, P.W.D., dated 16th October 1937.

[Papanasam hydro-electric scheme.]

In continuation of Official Memorandum No. 2838-E-37-1,* dated 8th October 1937, the Chief Engineer for Irrigation is requested to report on the following points regarding the Papanasam scheme reported on by the Chief Engineer for Electricity.

* Vide G.O. No. 653, Electricity, dated 29th March 1938.

2. If the dam is built for the hydro-electric scheme only it would have no sluice gates to pass down water for irrigation and the discharge over the dam would not help irrigation as it would give water mostly when not required. The turbines will allow only a limited quantity of water, and if more water is required in a particular day for irrigation requirements separate irrigation sluices will obviously be necessary. Information is required whether provision has been made in the estimates for separate irrigation sluices and if not how it is proposed to meet existing irrigation requirements.

3. The Chief Engineer for Irrigation is requested to state whether in the scheme now evolved the dam has been so designed as to be capable of being raised later on to give increased storage with provision for irrigation sluices. Such a course will be preferable if supply is available for increased storage. It should, therefore, be reported whether any dependable supply in excess of 5,500 million cubic feet will be available and if so whether the dam may not now be so designed as to be capable of being raised later on and whether such designing is difficult and whether a lower reservoir for irrigation purposes would be feasible as a later step.

4. The Chief Engineer is requested to submit the report as soon as possible.

W. Scott Brown,
Secretary to Government.

To the Chief Engineer for Irrigation.
Copy to the Chief Engineer for Electricity.

V

Letter from F. M. Dowley, Esq., M.I.C.E., Chief Engineer for Irrigation, to the Secretary to Government, Public Works Department, dated 23rd November 1937, No. 709/37-B-14.

[*Reference.*—O.M. No. 3436-D/37-1, dated 16th October 1937.]

Government require information on the following points :—

(1) (*a*) Whether provision has been made in the estimate for separate irrigation sluices and (*b*) if not how it is proposed to meet existing irrigation requirements;

(2) (*a*) whether the dam as designed is capable of being raised later to give increased storage and (*b*) whether it can be designed so as to permit of its being raised later;

(3) whether the dependable supply in the river permits of increased storage; and

(4) whether a reservoir further down the river for irrigation purposes is feasible as a later step.

2. Regarding (1) two pipes 8½ feet diameter will be built in the dam. These pipes will serve as irrigation sluices. The discharge which can be passed through the pipes is very much more than what is required to run the turbines and is adequate for irrigation requirements.

As regards (2) (*a*), the dam as designed cannot be raised later.

(2) (*b*) It is possible to provide in the design for raising the dam at a later date. The cost of providing extra storage of 1,000 million cubic feet over the 5,500 million cubic feet proposed by the Hydro-electric department is about 14 lakhs of which about 11 lakhs will be needed immediately for the wider foundations and increased section of the dam and about 3 lakhs will be required for the future raising. It is a characteristic feature of this dam that whereas the cost of increasing the storage from 4,000 to 5,000 million cubic feet is only 8 lakhs, a similar increase above 5,500 million cubic feet costs nearly 14 lakhs.

(3) Supply in the river is adequate to fill a larger reservoir in all years except 1909, 1910, 1911, 1918, 1934—please see also paragraphs 23 to 25 of the Electricity department report, section I, page 4, of the printed report.

(4) A reservoir at the diversion weir site can be built any time. A dam at the diversion weir site costs roughly 24 lakhs per 1,000 million cubic feet of water stored against 14 lakhs (per 1,000 million cubic feet above 5,500 million cubic feet) at the upper site but the lower reservoir will impound the flow not available at the upper reservoir site and contributed by the large catchment between the upper and lower sites. For details, please see page 58 of the Electricity Department report, section IV, sub-section D.

3. An analysis of the position shows that the need for increased supplies is generally felt in those years when the river flow is also inadequate. In certain years it is possible to provide full supplies for irrigation in Srivaikuntam and Marudur systems by greatly increased storage (irrespective of cost) and a carry-over of such storage from one year to the next. The arrangement generally succeeds when there is one bad year (1918) between two normal years but fails when two or more bad years follow each other (e.g., 1909, 1910, 1911, 1934, 1935). The note separately sent in reply to Government Memorandum No. 2838-E/37-1, dated 8th October 1937, through the Board (copy also sent direct) discusses the implications of the proposal. It will be noticed that the most economical combination is obtained by drawing supplies from the proposed hydro-electric reservoir in anticipation of a good north-east monsoon and making up the deficit on the power side by running the steam plant in the exceptionally bad years when the monsoon fails. The cost of running the steam plant in periods when it would not have been used but for the special draw off from the reservoir for irrigation will have to be met from irrigation funds as explained in the note.

4. I have discussed the matter with the Chief Engineer for Electricity and he is generally in agreement with the views expressed in the note.

VI

Letter from F. M. Dowley, Esq., M.I.C.E., Chief Engineer for Irrigation, to the Secretary to Government, Public Works Department, dated 23rd November 1937, No. 709/37-B-13.

[*Reference.*—O.M. No. 2838-E/37-1, dated 8th October 1937.]

In G.O. No. 1286 I., dated 29th May 1936, Government ordered that in framing proposals for the independent hydro-electric scheme, the requirements for irrigation purposes should also be taken into account. Apparently this meant that existing irrigation interests should be fully safeguarded and not that the scheme should be designed to give an assured supply for irrigation. It was, however, held that if as a result of the construction of the reservoir, irrigation requirements were assured and additional irrigation revenue resulted, credit might be afforded to the hydro-electric project from irrigation funds.

In designing the scheme the Chief Engineer for Electricity has taken care to see that water is impounded in the reservoir only when there is surplus over Srivaikuntam anicut and that only that portion of the run-off not at present utilized for irrigation is stored. The existing rights of irrigation are thus fully safeguarded.

2. Details about impounding formula to be used for day-to-day impounding and regulation will be settled later with the Electricity department. The next point for consideration is to see to what extent the proposed reservoir will help existing irrigation and how it may be worked to ensure the maximum benefit to both Government and ryots. This is examined in the note enclosed.

3. I recommend that in the circumstances explained in the note the scheme may be sanctioned and carried out as early as possible.

Enclosures.

(1)

Note on the Papanasam Scheme.

The Electricity department proposes to build a reservoir on the Tambraparni river at the upper site (just below the confluence of the Kariar) and to use the water stored plus the intermediate flow between the reservoir and the pickup weir (just below the confluence of the Servaiar) for the generation of electricity. The main points to examine are (1) to what extent the proposed reservoir will help existing irrigation and (2) if it is necessary in the interests of irrigation to enlarge the capacity of the reservoir so as to provide specially for irrigation requirements and if necessary, whether it is possible from the engineering and financial points of view.

2. To assess the benefits of the proposed reservoir, it is necessary to know the conditions of supply obtaining in the existing system. In paragraph II of the note on the combined irrigation and power reservoir project printed on page 2 of G.O. No. 1286 I., dated 29th May 1936, it is stated that during the kar season (June to September) on an average, 15,000 acres (kar) fare badly every year, 15,000 acres more every other year and an additional 15,000 acres every third year. Slight shortages appear to have been observed in some years in the pishanam season (October to February). The quantity required to make up the deficit was estimated at 1,350 million cubic feet for the kar season and 650 million cubic feet for the pishanam. This is said to be the estimate of Mr. Parameswaram Pillai who was in charge of the Tinnevelly division for four years. Definite data on which these statements have been made are not available. Since the note was prepared, the scheme was examined by the Collector of Tinnevelly, who wrote as follows in September 1935:—

> "Even in a bad year, there is enough water for the cultivation of the pishanam crop on all the wet lands in the north-east monsoon season (October to February). The season 1934-35 is a good example. It was a bad season and the Chittar river and many tanks in the district failed. Practically no remission was granted on the wet lands under the Tambraparni system. During the kar season, however, things are very different. During the last eleven years, there was inadequate supply of water in five years for kar crops in the Srivaikuntam and Tiruchendur taluks."

The Collector's report shows that difficulties occur only in the 'Kar' season and then only in Srivaikuntam and Tiruchendur taluks which are fed by the Marudur and Srivaikuntam anicut channels. This is what one would expect. The working tables show that the supply for pishanam must generally speaking be adequate and naturally the difficulties in the kar season increase as we go down the river. The upper anicuts draw their requirements even in a bad year, the lower anicuts suffer. The ayacut under Srivaikuntam the lowest anicut of all must suffer most, the ayacut under Marudur anicut which is some 12 miles up stream of Srivaikuntam suffers proportionately less and the ayacut served by the anicuts up stream of Marudur does not suffer at all, except in extremely bad years.

3. The main point, therefore, is to examine what help Srivaikuntam anicut system requires in the 'kar' season and see if the proposed reservoir gives it.

4. The areas irrigated (average for 11 years—1923 to 1933) under the Marudur and Srivaikuntam systems are as shown below:—

—	Direct irrigation.	Indirect irrigation.	Single crop mostly pishanam.	Double crop.	Maximum second crop (kar) area irrigated in the last fifteen years.
	ACS.	ACS.	ACS.	ACS.	ACS.
Marudur	3,400	13,500	2,900	14,000	16,100
Srivaikuntam	8,100	16,600	8,000	16,700	19,000

5. Taking Srivaikuntam anicut for which discharge figures are available, the maximum area of kar grown under the system in the last 15 years is 19,000 acres, i.e., 2,300 acres or 14 per cent more than the registered area of the double crop. The depth of water required to mature the crop may be taken as 42 inches. The total required for a successful 'kar' crop is $19{,}000 \times 3\frac{1}{2}$ feet $= 2{,}890$ million cubic feet. Allowing for losses (25 per cent) the quantity required may be put down as $(2{,}890 + 723) = 3{,}613$ or 3,600 million cubic feet.

6. Table A shows the flow through the Srivaikuntam head sluices for the months March to May (after the pishanam and before the kar crop), and June to September (the kar season). The last column of the statement shows the surpluses at the anicut from March to September. This table that the reservoir has not been built.

7. Table B shows the natural flow that will pass down the river at the power station site and the additional draw from the reservoir for power over and above the natural flow. The power draft shows the additional flow made available by the reservoir from the storage accumulated at times when there is flow in excess of requirements which, but for the reservoir would have been wasted over Srivaikuntam anicut. The power draft is thus a definite addition to the supplies available for irrigation.

8. A part of the power draft will be lost in transmission by seepage and evaporation. This may be taken as 25 per cent. The balance may be earmarked for the Marudur and Srivaikuntam anicut systems which are the systems which suffer chiefly from inadequate supplies. The areas of the two systems being 16:19 the proportionate quantity of the power draft that can be made available at Srivaikuntam is $\frac{19}{35} \times \frac{3}{4} = \frac{38}{105}$ or 40 per cent of the flows let down from the reservoir for power.

9. In Table A, these flows are indicated.

10. Knowing that a successful kar crop requires 3,600 million cubic feet, we can classify the kar seasons for the 28 years—1908 to 1935. The seasons have been classified in Table C as—

Good—when 3,600 million cubic feet or more is available.
Fair—when deficit is between 0 and 10 per cent.
Middling—when deficit is between 10 and 20 per cent.
Bad—when deficit is between 20 and 30 per cent.
Very bad—when deficit is above 30 per cent.

and the result shows that *without the reservoir* there are—

Eleven good years, i.e., 1915, 1919, 1920, 1922, 1923, 1924, 1926, 1929, 1931, 1932 and 1933.

Four fair years, i.e., 1916, 1925, 1927 and 1930.

One middling year, i.e., 1914.

Four bad years, i.e., 1909, 1911, 1912 and 1921.

Eight very bad years i.e., 1908, 1910, 1913, 1917, 1918, 1928, 1934 and 1935.

while *with the help derived from the reservoir* the classification becomes—

Fourteen good years, i.e., 1911, 1915, 1916, 1919, 1920, 1922, 1923, 1924, 1925, 1926, 1929, 1931, 1932 and 1933.

Five fair years, i.e., 1912, 1914, 1922, 1927 and 1930.

One middling year, i.e., 1909.

Three bad years, i.e., 1913, 1917 and 1934.

Five very bad years, i.e., 1908, 1910, 1918, 1928 and 1935.

11. The above analysis shows that the proposed reservoir modifies the seasons favourably in many years. The good years are increased from 11 to 14 and the very bad years reduced from 8 to 5.

12. It is possible to further improve the irrigation value of the reservoir by depleting it in anticipation of the succeeding north-east monsoon floods. There is a difficulty about the proposal. If the season following should turn out to be favourable, the only result of this special issue for irrigation will be to reduce the subsequent surplus from the reservoir but if after the special issues for irrigation the subsequent north-east monsoon turns out to be bad the storage left may, in some years, be insufficient to meet the full demand for the hydro plant. The Electricity department intend to have an auxiliary steam plant when full development is nearly reached. This auxiliary plant can be used to meet any deficits that occur in the hydro plant, and the difference in cost of generating electricity by the hydro and thermal plant, may be debited to Irrigation funds in the particular year in which the north-east monsoon fails and shortages occur. To guard against a complete failure of the hydro plant, a minimum storage below which issues for irrigation should not be made may be prescribed (excess over 1,900 million cubic feet on 1st August and 1,600 million cubic feet on 1st September is assumed as available for irrigation so as to have a minimum balance of 1,000 million cubic feet on 1st October), and issues for both power and irrigation suitably adjusted. These are matters which may be taken up at a later stage. Table D appended shows approximately how the proposal will work.

In all years except 1910 and 1935 when the storage was very low, supplies to irrigation can be made from the reservoir. In 1909, 1928 and 1934, it is possible to issue only a part of the deficit as the excess over the minimum storage on the 1st August and 1st September does not suffice to meet the entire deficit. The special issues for irrigation would have been made up by the excess flows of the north-east monsoon in all years except four. For the four years the steam plant will have to take up larger loads, and the Irrigation department will have to pay for the difference in the cost of generation.

The cost per million cubic feet of water to irrigation is roughly worked out to be Rs. 130—vide note in Table D. On this basis the Irrigation department will have to pay the Electricity department approximately Rs. 34,200 annually, on an average, for the benefits conferred by the reservoir in such bad years.

To tide over years such as those in which the north-east monsoon fails (1934) a reservoir of capacity approximately 3,200 million cubic feet bigger = (2,969 + 8 per cent for evaporation losses) will be required. To tide over years like 1910 and 1935 will require nearly 6,700 million cubic feet extra, as storage will have to be carried over two seasons but even so it would be impossible to meet the demand in 1909 and 1910, as the surplus in 1908 was only 2,772 million cubic feet. Reference to Table I on page 4 of the Electricity department report will show that the cost of storage above 5,500 million cubic feet goes up enormously. An extra 2,350 over 5,500 million cubic feet costs nearly 35 lakhs whereas the capitalized value of Rs. 34,200 at 25 years purchase would hardly exceed 8·5 lakhs. Moreover a bigger reservoir will afford no greater protection than the proposed one in consecutive bad years such as 1909, 1910 and 1911.

The reservoir as designed should, therefore, be accepted and the sooner it is built the better for irrigation. Generally speaking the hydro-electric scheme as it stands and making no special provision for irrigation is highly beneficial; until the power demand reaches a figure roughly 75 per cent of the possible output which will be five to ten years after completion the reservoir will afford practically complete protection to irrigation except in very bad years. When the power-load grows and the supplementary steam plant is installed we still get practically complete protection though we may then have to pay for it. Even if we do, it is far cheaper to pay than to sink 35 lakhs in raising the dam.

(2)

Table A.

Srivaikuntam Anicut.

Statement showing discharges through the head sluices and also the surplus over the anicut and through the undersluices.

Years.	Discharge through head sluice. March.	April.	May.	Total.	June.	July.	August.	September.	Total.	Surplus discharges through under sluice and over anicut. Month.	Discharge.	
1908 ..	1,257	499	284	2,040	186	585	335	290	1,400	March	295	
		380			60					April ..	641	1,095
										May ..	159	
										July ..		
1909 ..	133	53	561	747	418	717	520	415	2,070	April ..	7	7
		660								May ..	21	
										June ..	1,498	1,519
										July ..	5	
										September ..	16	22
1910 ..	119	83	90	292	117	170	657	436	1,380	April ..	1	
		1,020			110	50				May ..	170	
1911 ..	53	62	15	130	794	1,545	230	94		August ..	125	295
		960					108	251	2,663	June ..	216	216
										July ..	1,335	
1912 ..	132	253	50	435	856	686	502	153	2,197	April ..	198	1,533
		1,040						152		May ..	238	238
										June ..		
										July ..	1,079	
1913 ..	469	313	242	1,024	486	715	240	79	1,520	April ..	2	1,081
		820						240		June ..	96	96
1914 ..	320	213	..	542	339	1,412	80	191	2,378	July ..	180	
		914			20		436	45		April ..	547	727
										May ..	82	
1915 ..	543	455	18	1,016	768	1,353	1,208	747	4,076	June ..	57	82
		898			128					July ..	3,520	57
										August ..	4,928	
										September ..	1,591	10,167
1916 ..	244	161	294	699	1,326	559	445	616	2,946	June ..	128	
		954									1,510	1,510
1917 ..	468	250	102	820	193	445	218	804	1,660	April ..	10	
		680			20					September ..		10
1918 ..	416	279	1,205	1,900	282	281	46	131	720	May ..	589	589
		580				85	55	140		June ..	2,357	2,357
1919 ..	333	251	308	892	1,295	540	1,086	721	3,641	August ..	1,437	
		761						20		September ..	710	2,151
1920 ..	269	601	290	1,160	931	1,696	485	239	3,351	June ..	4	
		1,027			134					July ..	1,702	
1921 ..	279	485	167	931	84	853	819	270	2,026	July ..	329	2,041
		967			128	106		42		August ..	777	
											1,038	1,815
1922 ..	528	589	383	1,500	429	2,030	273	271	3,003	April ..	38	
		537					13			May ..	43	81
										June ..	346	
										July ..	1,961	2,307
1923 ..	547	532	168	1,247	686	1,557	1,464	466	4,173	May ..	23	
		970								June ..	1,291	23
										July ..	3,010	
										August ..	7,420	11,721
1924 ..	295	50	41	386	134	1,180	1,502	875	3,691	April ..	557	
		985								May ..	304	861
										June ..	4,670	
										July ..	20,620	
										August ..	320	27,261
1925 ..	961	375	254	1,590	440	973	720	407	2,540	September ..	1,651	
		477			89			106		March ..	2,626	
										April ..	68	2,929
										May ..	235	
										June ..	2,533	
										July ..	220	2,773
1926 ..	645	421	132	1,198	486	1,203	1,047	890	3,626	August ..	20	
		892								March ..	516	
										April ..	13	1,166
										May ..	637	
										June ..	21	
										July ..	1,118	
										August ..	4,320	5,679
1927 ..	533	499	546	1,578	786	862	392	448	2,488	September ..	220	
		539					10	84		March ..	6,100	
										April ..	895	8,423
										May ..	1,428	
										June ..	6,520	
										July ..	29	6,549
1928 ..	356	364	191	911	652	350	160	108	1,270	March ..	1	
		960						80		May ..	4	5
										June ..	65	
										July ..	130	65
1929 ..	369	525	431	1,325	1,099	1,523	477	513	3,612	May ..	1,047	130
		962								June ..	2,401	
										July ..	90	3,538
										September ..	28	
1930 ..	638	629	251	1,518	599	476	200	1,065	2,340	April ..	658	686
		764								May ..	101	
										June ..	396	
										July ..	1,194	1,691
1931 ..	292	258	186	736	365	381	2,053	829	8,628	August ..	1,748	
		1,034								September ..	439	2,187
										April ..	135	
										May ..	4,710	4,845
1932 ..	331	158	657	1,146	425	780	778	1,453	3,436	June ..	16	
		828								July ..	127	
										August ..	213	876
										September ..	526	
1933 ..	373	504	552	1,429	1,634	1,368	1,160	1,308	5,470	April ..	308	
		786								May ..	7,340	7,648
										June ..	2,603	
										July ..	3,005	
										August ..	3,000	13,868
										September ..	5,260	
1934 ..	180	175	185	540	440	592	286	42	1,360	March ..	772	
		980						280		April ..	431	1,323
										May ..	120	
										June ..	65	
										July ..	49	114
1935 ..	185	695	160	1,040	30	180	355	405	970	..	..	
		960			200							

(3)

Table B.

Statement giving flows in the several years at the Diversion weir site (from working tables of Papanasam Project for 5,500 m.cft. reservoir).

Year.	March, April and May. Natural flow.	Power draft.	Total.	June, July and August. Natural flow.	Power draft.	Total.	September. Natural flow.	Power draft.	Total.
1908	2,300	950	3,250	6,300	150	6,450	1,700	..	1,700
1909	1,750	1,650	3,400	7,550	..	7,550	1,950	..	1,950
1910	350	2,550	2,900	5,950	400	6,350	2,400	..	2,400
1911	450	2,400	2,850	11,150	250	11,400	300	650	950
1912	250	2,600	2,850	10,000	..	10,000	550	400	950
1913	800	2,050	2,850	8,600	200	8,800	350	600	950
1914	600	2,300	2,900	9,150	50	9,200	850	100	950
1915	600	2,250	2,850	14,050	300	14,350	3,400	..	3,400
1916	500	2,400	2,900	10,800	..	10,800	2,300	..	2,300
1917	1,150	1,700	2,850	6,900	50	6,950	3,300	..	3,300
1918	4,050	1,450	5,500	6,150	350	6,500	650	350	1,000
1919	950	1,900	2,850	13,650	..	13,650	1,600	50	1,650
1920	300	2,550	2,850	12,200	350	12,550	1,550	..	1,550
1921	450	2,400	2,850	8,300	600	8,900	950	150	1,100
1922	1,600	1,350	2,950	9,450	50	9,500	1,400	..	1,400
1923	450	2,400	2,850	18,950	..	18,950	1,700	..	1,700
1924	400	2,450	2,850	20,650	..	20,650	2,850	..	2,850
1925	1,950	1,200	3,150	8,050	250	8,300	700	250	950
1926	650	2,200	2,850	10,100	..	10,100	1,700	..	1,700
1927	2,750	1,350	4,100	11,300	..	11,300	2,350	200	2,550
1928	450	2,400	2,850	7,300	..	7,300	750	200	950
1929	450	2,400	2,850	9,550	..	9,550	1,500	..	1,500
1930	1,650	1,900	3,550	6,750	..	6,750	3,150	..	3,150
1931	250	2,600	2,850	12,750	..	12,750	1,600	..	1,600
1932	900	2,050	2,950	6,950	..	6,950	3,350	..	3,350
1933	2,600	1,950	4,550	18,150	..	18,150	4,500	..	4,500
1934	400	2,450	2,850	7,100	..	7,100	250	700	950
1935	450	2,400	2,850	5,050	500	5,550	2,250	..	2,250

(4)

Table C.

Statement showing yearly deficits, the crop requirements being 3,600 m.cft.

Year.	Flow, June to September. No reservoir.	With reservoir.	Deficit, June—September. (3,600 m.cft. column 2). No reservoir.	(3,600 m.cft. column 3) with reservoir.	Net storage delta tanks, March—May. No reservoir.	With reservoir.	Net deficit, June—September. (Column 4 column 6). No reservoir. Percentage.	(Column 5 column 7). With reservoir. Percentage.	Nature of season. No reservoir.	With reservoir.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
1908	1,400	1,460	2,200	2,140	900	900	1,300	36	1,240	34	V.B.	V.B.
1909	2,070	2,070	1,530	1,530	560	900	970	27	630	18	B.	M.
1910	1,380	1,540	2,220	2,060	219	900	2,001	56	1,160	32	V.B.	V.B.
1911	2,663	3,022	937	578	98	818	839	24	..	..	B.	G.
1912	2,197	2,349	1,403	1,251	326	900	1,077	30	351	10	B.	F.
1913	1,520	1,840	2,080	1,760	768	900	1,312	36	860	24	V.B.	B.
1914	2,378	2,443	1,222	1,157	607	900	615	17	257	7	M.	F.
1915	4,076	4,204	..	..	762	900	..	..	..	..	G.	G.
1916	2,946	2,946	654	654	524	900	130	4	..	..	F.	G.
1917	1,660	1,680	1,940	1,920	615	900	1,325	37	1,020	28	V.B.	B.
1918	720	1,000	2,880	2,600	900	900	1,980	55	1,700	47	V.B.	V.B.
1919	3,641	3,661	..	..	669	900	..	..	..	..	G.	G.
1920	3,351	3,485	249	115	870	900	..	..	..	..	G.	G.
1921	2,026	2,302	1,574	1,298	698	900	876	24	328	9	B.	F.
1922	3,003	3,016	597	584	900	900	..	..	..	..	G.	G.
1923	4,173	4,173	..	..	900	900	..	..	..	..	G.	G.
1924	3,691	3,691	..	..	290	900	..	..	..	..	G.	G.
1925	2,540	2,735	1,060	865	900	900	160	4	..	..	F.	G.
1926	3,626	3,626	..	..	899	900	..	..	..	..	G.	G.
1927	2,488	2,582	1,112	1,018	900	900	212	6	118	3	F.	F.
1928	1,270	1,350	2,330	2,250	683	900	1,647	46	1,350	38	V.B.	V.B.
1929	3,612	3,612	..	..	900	900	..	..	..	..	G.	G.
1930	2,340	2,340	1,260	1,260	900	900	360	10	360	10	F.	F.
1931	3,628	3,628	..	..	552	900	..	..	..	..	G.	G.
1932	3,436	3,436	164	164	860	900	..	..	..	..	G.	G.
1933	5,470	5,470	..	..	900	900	..	..	..	..	G.	G.
1934	1,360	1,640	2,240	1,960	405	900	1,835	51	1,060	29	V.B.	B.
1935	970	1,170	2,630	2,430	780	900	1,850	51	1,530	43	V.B.	V.B.

G. = Good. F. = Fair. M. = Middling. B. = Bad. V.B. = Very bad.

G. = Good. F. = Fair. M. = Middling. B. = Bad. V.B. = Very bad.

Note.—The total storage capacity of the tanks in the Srivaikuntam system is reported to be 1,200 million cubic feet. Allowing 25 per cent for evaporation losses the storage in March to May available for issues for irrigation will only be 1,200 — 300 = 900 million cubic feet. Hence available storage is limited to 900 million cubic feet in columns (6) and (7).

(5)

TABLE D.

Statement showing years of deficit and how the deficit will be made up.

Year of deficit.	Net deficit with reservoir. At Srivaikuntam anicut.	Net deficit with reservoir. Total deficit 2¼ of column (2).	Surplus in north-east monsoon from reservoir.	Storage in reservoir on 1st August.	Issues for irrigation from surplus.	Issues from reservoir storage to be paid for.	Remarks.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1908	1,240	2,790	566	4,498	566	2,224	
1909	630	1,418	..	3,336	..	1,256	Not possible to issue more than 1,256 million cubic feet as the extra issues of 2,224 millions cubic feet in 1908 would have reduced the storage on 1st August 1909.
1910	1,160	2,610	..	1,077	..	*	* Reservoir low. No issue possible.
1912	351	790	2,941	3,236	790	..	
1913	860	1,935	3,827	3,939	1,935	..	
1914	257	578	6,945	2,363	578	..	
1917	1,020	2,295	2,973	3,477	2,295	..	
1918	1,700	3,825	856	5,215	856	2,969	
1921	328	738	3,856	3,272	738	..	
1927	118	266	2,615	5,495	266	..	
1928	1,350	3,038	3,048	2,818	1,566	..	Not possible to issue the full deficit as storage will not admit of it.
1930	360	810	5,234	4,693	810	..	
1934	1,060	2,385	..	2,668	..	918	Deficit not made up fully for want of storage.
1935	1,530	3,442	2,591	645	1	..	Reservoir too low. Issues not possible.
Total special issues from storage						7,367	
Average for one year						$\frac{7,367}{28}$ = 263	
Average annual payment to be made						263 × 130 = Rs. 34,190 or say Rs. 34,200.	

NOTE.—(1) Figure in column (3) is taken as 2¼ times that in column (2) on the following basis. If D is the deficit at Srivaikuntam headsluice the quantity to be issued from the reservoir allowing 25 per cent for transmission losses will be D × 5/4. And again to allow for the deficit for Marudur anicut also in the proportion of ayacuts the total issue should be $D \times 5/4 \times \frac{35,000}{19,000}$ or 2·3 D. Taking into account the fact that Marudur anicut is 12 miles higher up and consequently the transmission loss for its supply will be slightly less, the total issue may be taken as 2·25 D.

(2) In all years payment is proposed, the quantity drawn for irrigation should be adjusted by reduced draw off for power in the months of October to February.

(3) Cost of 1 million cubic feet of water (assumed on the basis of production of energy by steam plant) is Rs. 130—vide C.E.E's. letter, dated 22nd November 1937.

VII

Reference from the Board of Revenue, H. No. 1886/37-2, dated 21st December 1937.

[Irrigation—(Tinnevelly)—The Papanasam hydro-electric project—Chief Engineer's letter forwarded.]

Read—the following :—

Memorandum No. 2838-E/37-1, P.W.D., dated 8th October 1937.

From the Chief Engineer for Irrigation, dated 23rd November 1937, No. 709/37-B-13.

Reference—H. No. 1886/37-2, *dated* 21*st December* 1937.

Submitted to the Government through the Irrigation Development Board.

2. In their Order No. 1286, P.W. (Irrigation), dated 29th May 1936, the Government refused to sanction the Papanasam reservoir scheme as part irrigation project as the expected return fell far short of the criterion of productivity and as even the low return anticipated depended upon the proposed conversion of the dry lands and single-crop wet lands to compounded double-crop wet lands which might be a matter of some difficulty as the consent of every registered landholder would have to be obtained. They however sanctioned the detailed investigation of the scheme as a purely hydro-electric venture and directed that the requirements for irrigation purposes should be taken into account and that if it was found that there was an assured supply from the reservoir for irrigation resulting in additional irrigation revenue, the question of affording a credit to the hydro-electric project from irrigation funds would be considered. In pursuance of the above order, further investigation has been made and the result of the investigation is embodied in the printed report of the Chief Engineer for Electricity.

3. In designing the scheme, the Chief Engineer for Electricity has taken care to see that water is impounded in the reservoir only when there is a surplus over the Srivaikuntam anicut and that only that portion of the run off not at present utilized for irrigation is stored. This safeguards the existing rights of irrigation as pointed out by the Chief Engineer for Irrigation.

The Board of Revenue is concerned only with the irrigation aspects of the scheme. The Chief Engineer for Irrigation has considered the question whether the capacity of the reservoir should be increased to provide for the needs of irrigation in certain bad years and concludes that a bigger reservoir will afford no greater protection than the proposed one in consecutive bad years, and that it is cheaper to pay for the cost of generation by steam plant in such bad years than sink 35 lakhs in raising the dam. The Board agrees with the Chief Engineer.

The Chief Engineer for Electricity expects a substantial contribution from irrigation for the benefits to be conferred by the reservoir both on irrigation and as a flood moderator. This contribution he proposes to use to reduce the rates for power to be supplied under the scheme. The note by the Chief Engineer for Irrigation indicates that irrigation will have to pay electricity only in the years when the steam plant is required to take up larger loads in the interest of irrigation. The Board doubts whether the two Chief Engineers are at one on the subject of contribution. The Chief Engineer for Irrigation has calculated the amount to be paid to electricity by a reconstruction of the irrigation history of the past if the reservoir had been functioning and by an estimation of the water required in the interests of irrigation. The average annual payment is estimated at Rs. 34,200. The Board submits that no contribution can be expected from irrigation unless the benefit justifies the levy of increased rates and additional revenue is realized in fact. The Board would submit at the outset that no contribution can be expected from the existing ayacut for the general benefits referred to by the Chief Engineer for Electricity. As already pointed out by the Board, 90 per cent of the wet lands are compounded double-crop wet lands. The compounded rates are high and the kar season has failed partially in many years. Though in all cases of compounding an element of risk has to be faced, the Board does not consider that a reduction of this risk as indicated in paragraph 10 of the Chief Engineer's note should carry with it a demand for extra assessment. The Board would also point out that no additional revenue by way of extra assessment was expected from these lands when the power cum irrigation scheme was reported on by the Board in 1935 though these lands were expected to get an assured supply.

In 1935 additional revenue was expected under three heads—

(1) Transfer of dry lands to compounded double-crop wet.

(2) Transfer of dry lands to single-crop wet.

(3) Transfer of single-crop wet to compounded double-crop wet.

The total additional revenue expected was about Rs. 35,600. If it is decided that any fixed annual contribution from irrigation to electricity should be made whether as a return for the general benefits or as payment for definite expenditure by electricity made solely in the interests of irrigation the Board considers that the proposal of 1935 mentioned above may be adopted. The Board does not however consider a fixed annual contribution to be justifiable. All increase in revenue that may be expected from the two last anicuts across the Tambraparni river (for which alone capital and revenue accounts are kept) after the construction of the reservoir by way of transfers from dry to wet, etc., may be credited to the Electricity department. The transfers from dry to wet, etc., will be made as and when justified. This seems to the Board the most equitable and simple method of making adjustments between irrigation and electricity if the scheme is to be sanctioned as a purely hydro-electric scheme, though an uncertain fluctuating addition to revenue of this kind may not help the Electricity department much in the way of reducing the rates.

D. I. R. MUIR,
Joint Secretary.

To the Secretary to Government, Public Works Department (through the Irrigation Development Board), with the Chief Engineer's letter and note. (Printed as paper VI.)

Copy to the Chief Engineer for Irrigation.
,, Director of Agriculture with the Chief Engineer's letter and note.
,, Secretary to Government, Public Works Department, direct.

VIII

Note on the Papanasam Reservoir Project, by Mr. K. R. Karant, dated 17th January 1938.

Vide G.O. No. 653, Electricity, dated 29th March 1938.

The report * of the Chief Engineer for Electricity provides for the construction of a reservoir with a capacity of 5,500 million cubic feet of water. He finds that this is the most economic capacity. The dam to be built is to be 176 feet high. The power to be developed by an hydro-electric installation is 27,000 h.p. from three generators of 9,000 h.p. each. This power is to be supplemented, when load develops, by power generated from a steam plant consisting of three turbo generators of 5,000 k.w. each. This is equivalent to 20,000 h.p. The capital cost of the steam plant will amount to Rs. 26·5 lakhs. The cost of the hydro-electric installation inclusive of the dam, power house, etc., is 181·66 lakhs (page 35 of the report) whilst the cost of transmission lines is 54·51 lakhs (page 39 of the report). The total capital cost of the project would be 258 lakhs in the tenth year of its working. The return expected on a 4 per cent basis is 6·28 per cent.

2. This report of the Chief Engineer for Electricity has been referred to the Chief Engineer for Irrigation who, in his letter to Government, dated 23rd November 1937, recommends that the projects as proposed by the Chief Engineer for Electricity would be advantageous for irrigation also and that therefore it should be taken up and executed as early as possible.

3. During the visit of Hon'ble the Minister for Public Works and myself in the Tinnevelly district in the early part of December last it was urged by the people at almost every place we visited that the project should be a combined one for irrigation and electricity and that it should assure proper supply for irrigation to make good the constant deficiency felt year after year in the irrigated areas of the Tambraparni system.

4. From another letter of the Chief Engineer for Irrigation also, dated 23rd November 1937, I find that he has been asked to report on the following amongst other points :—

(1) whether the dam as designed is capable of being raised later to give increased storage;

(2) whether it can be designed so as to permit of its being raised later; and

(3) whether the dependable supply in the river permits of increased storage.

5. The answers of the Chief Engineer for Irrigation to these questions may be summed up as follows :—

(1) The dam as designed cannot be raised later;

(2) it could be designed at an extra expenditure of Rs. 14 lakhs to impound 1,000 million cubic feet more. Of this sum; Rs. 11 lakhs would be required for wider foundations and sections, and Rs. 3 lakhs for the future raising of the dam; and

(3) the supply in the river is adequate to fill a larger reservoir in all years except 1909, 1910, 1911, 1918 and 1934, i.e., in 5 out of the 28 years from 1908 to 1935 dealt with in his report on the main question.

6. The questions for consideration would therefore be—

(1) Whether, and if so, to what extent the proposed reservoir and project would interfere with the existing supply of water to irrigated areas;

(2) whether the proposals as designed are sufficient to ensure an adequate supply estimated to be necessary for making good the existing deficiency for irrigation; and

(3) if not, whether Rs. 14 lakhs extra should be spent for impounding 1,000 million cubic feet more, and if spent what would be the advantage therefrom.

7. Before dealing with any of the three points noted above, it would be worth while briefly to summarize the position of the problem as a whole. Without going into details, it is sufficient to say that, as seen from page 2 of G.O. No. 1286 I., dated 29th May 1936, the total extent of irrigated wet lands under the Thambraparni system is about 79,000 acres of which nearly 63,300 acres form double-crop wet. In this river there are eight anicuts, one to six of which have been built in the pre-British period and the seventh and eighth called Marudur and Srivaikuntam built later. A good portion of this double-crop area pays a compounded wet assessment of Rs. 22-8-0 per acre, admittedly the highest in the whole province. On account of the constant scarcity of water, it has been found for over half a century now that a good bulk of the first crop called 'kar' and a similar extent of the second crop called 'pishanam' get destroyed, thereby resulting in much loss to the ryot population. Accordingly, there has been an insistent clamour in the district for a reservoir to be built on this river with a view to give a guaranteed supply of water. This claim has been recognized and admitted as just for decades past.

8. A project for the construction of a reservoir seems to have had its inception so long ago as 1830. From time to time since then proposals have been made for its construction, and the last Government Order that deals with the subject is G.O. No. 1286 I., dated 29th May 1936, referred to above. It is seen therefrom that annually about 15,000 acres suffer very badly for the first crop, 15,000 acres more every other year, and still another 15,000 acres in one year out of three. That means to say that annually about 15,000 acres fail, whilst in two years 30,000 acres, and once in three years as much as 45,000 acres. It is seen from the said Government Order and the materials contained therein that the first crop fails for want of two wettings and the second crop of one. It has therefore been estimated that it would require about 1,500 million cubic feet of water for making up this deficiency, and allowing for losses in transmission at 33 per cent it has been found that a storage of 2,000 million cubic feet would be required to make up the deficiency. Accordingly, in the proposals brought up for the consideration of Government in the said G.O. No. 1286 it was proposed to ensure the supply of 2,000 million cubic feet and to provide for this purpose a reservoir to impound 6,200 million cubic feet for a combined hydro-electric project. Though the project was expected to yield only 2·6 per cent, it was very strongly supported for acceptance by the Board of Revenue and the Irrigation Development Board. This support was based upon the fact that such large areas of existing irrigation suffer so constantly and ryots are put to heavy loss. The difficulties suffered by the people have been adequately described in that Government Order and it is unnecessary to repeat them here.

9. Government, however, turned down the proposal. They considered that the proposal was unremunerative but directed in the last sentence of the Government Order as follows :—

> "In making the investigation (for a hydro-electric scheme), the requirements for irrigation purposes should also be taken into account and if it is found that there is an assured supply from the reservoir for irrigation resulting in additional irrigation revenue, the question of affording a credit to the hydro-electric project from irrigation funds will be considered."

It is in pursuance of that Government Order that the Chief Engineer for Electricity has made the present proposals.

10. I shall now deal with points (1) and (2) raised in paragraph 6 above, namely :—

(1) whether, and if so, to what extent the proposed reservoir and project would interfere with the existing supply of water to irrigated areas; and

(2) whether the proposals as designed are sufficient to ensure an adequate supply estimated to be necessary for making good the existing deficiency for irrigation.

The Chief Engineer for Irrigation states in his letter that the existing supplies to irrigation are adequately provided for and will not be interfered with and so far as the making up of the deficiency of supplies is concerned, the project will go far to improve the existing state of affairs. In making these recommendations he has made the following three assumptions, namely :—

(*a*) that the intention of Government in G.O. No. 1286 is that the existing supply to irrigation should not be interfered with;

(*b*) that the deficiency of supplies exists only in the irrigated areas under the last two anicuts, namely, Marudur and Srivaikuntam; and

(*c*) that even in those places though the first crop may fail the second crop is invariably good.

11. The Chief Engineer for Irrigation seems to think that the intention of G.O. No. 1286 is not so much that any project should provide for making good the deficiency for existing irrigation, namely 2,000 million cubic feet, but that it only lays down that the project should not interfere with or diminish the existing supplies to irrigation. To quote him this is what he says :—

> "In G.O. No. 1286 I., dated 29th May 1936, Government ordered that in framing proposals for the independent hydro-electric scheme the requirements for irrigation purposes should also be taken into account. Apparently this meant that existing irrigation interests should be fully safeguarded and *not that the scheme should be designed to give an assured supply for irrigation.*"

It seems to me that this interpretation of the intention of Government is wrong. If that was the intention there was nothing easier than to state that any proopsals to be submitted should not interfere with exising supplies. In fact, such a direction was hardly necessary because Government cannot afford to interfere with existing supplies and if it did it would expose itself to the risk of litigation and loss. On the other hand, as far as I am able to make out what Government intended was clearly that any project to be proposed should take into account the 'requirements' of irrigation (not merely of the existing supply) so that the deficiency complained of for so long might be provided for, and if an assured supply was forthcoming with the result that there was additional revenue from irrigation credit should be taken to the Department of Electricity from those sources. It may be that the supply would not be enough for bringing in new areas into irrigation or it would be just enough to make good the existing deficiency in which case it would not be possible to raise any fresh revenue. In such cases there would be no scope for taking credit towards electricity. But so far as providing for the requirements of irrigation are concerned any project which was to be put up should provide for them. That is how I understand the intention of the Government Order and I think that though the language used in the last sentence quoted above is very cryptic it cannot mean anything else.

12. Two other assumptions have been made by the Chief Engineer for Irrigation. They are—

(i) that the deficiency of supply exists only in the last two anicut systems, viz., Srivaikuntam and Marudur; and

(ii) that out of the two crops, kar and pishanam, it is only the kar crop that is bad, pishanam being good.

This is what he says quoting a report of 1935 of the Collector of Tinnevelly—

"*Even in a bad year, there is enough water for the cultivation of the pishanam crop on all the wet lands in the north-east monsoon season* (October to February). The season 1934–35 is a good example. It was a bad season and the Chittar river and many tanks in the district failed. Practically no remission was granted on the wet lands under the Tambraparni system. During the kar season, however, things are very different. During the last 11 years, there was inadequate supply of water in five years for kar crop in the Srivaikuntam and Tiruchendur taluks."

Then the Chief Engineer for Irrigation goes on—

"*The Collector's report shows that difficulties occur only in the 'kar' season and then only in Srivaikuntam and Tiruchendur taluks which are fed by the Marudur and Srivaikuntam channels. This is what one would expect.* The working tables show that the supply for pishanam must generally speaking be adequate and naturally the difficulties in the kar season increase as we go down the river. *The upper anicuts draw their requirements even in a bad year, the lower anicuts suffer. . . The main point therefore is to examine what help Srivaikuntam anicut system (evidently a mistake for both Marudur and Srivaikuntam) requires in the kar season and see if the proposed reservoir gives it. . .*"

In my opinion both the assumptions referred to above are not correct.

13. The materials contained in the said G.O. No. 1286 show that the 45,000 acres that suffer badly are spread over the whole system and not confined only to the last two anicuts. The extent of irrigated lands in the last two amounts only to 41,698 acres and of this extent, it is obvious that not all could suffer. Those which are situated at the heads of the channels or in close proximity to tanks would not suffer, so that out of the extent of 41,000 and odd acres it might be only about 25,000 acres that would suffer. On the other hand out of 45,000 acres estimated to suffer (once in three years) all over I think that about 20,000 acres lie in the upper anicut systems. I have no doubt that figures would be available in the Revenue department in the district which would show where exactly these areas which suffer badly year after year are located. My own observations during the tour supported by local enquiries confirm the view that they lie all over except perhaps in the first one or two anicut systems. From the third anicut downwards we found that there was hardly any water in the channels or in the river itself. We were told that the first crop this year had suffered in the Tambraparni system as a whole barring only the first anicut. As matters stand, I have little doubt that the 45,000 acres are spread over the whole system though the extent in the lower anicuts would be more than in the upper. To proceed, therefore, on the assumption that scarcity is felt only in the last two anicut systems ignoring the needs of the rest seems to be committing a serious error.

14. The other assumption that if the kar crop is bad the pishanam is good seems to be equally wrong. It is evidently based upon the Collector's report quoted above which again depends upon the figures of remission. It is well known that the remission of assessment is no criterion to judge the loss of crops to the ryots. Particularly where assessment is compounded for two crops, it is only if each one of the crops yields 4 annas or less there is going to be any remission. If, for instance, the first crop gives 2 annas in the rupee, but the second one gives 5 annas, then there is no remission. At the same time no one will contend that there has been no failure of crops and consequently no loss to the ryots. Again, the estimation of crops by revenue officials made in the interests of revenue is ordinarily stringent. To frame proposals for meeting the requirements of irrigation upon any such process would be following an obviously wrong path. From enquiries made in the district I learnt that it is not at all correct to say that in every year one or the other crop is good whilst the other one may be bad. In this year itself, the first crop was reported to be very bad practically all over. As already stated when we toured during the second crop the channels were practically empty and it was expected that the second crop would also be a failure unless there was an unexpected rainfall. I am sure that there would be figures maintained in the Tinnevelly Collectorate to show how far and in what years and to what extent both the crops have been failures.

15. Dealing with the first question as to how far the proposed reservoir will or will not interfere with existing irrigation, except the statement of the Chief Engineer for Irrigation that it has been adequately safeguarded, I do not find any discussion of this topic. In fact, all that he says upon the subject is this: "In designing the scheme the Chief Engineer for Electricity has taken care to see that water is impounded in the reservoir only when there is supply over Srivaikuntam anicut and that only that portion of the run off not at present utilized for irrigation is stored. The existing rights of irrigation are thus fully safeguarded." Evidently this means that the total quantity to be conserved in and utilized from the reservoir does not fall short of the existing supply to irrigation. But that does not necessarily mean that that supply would be available for purposes of cultivation in such manner and in such quantities as would be required. To make matters clear a man may require two square meals a day at stated intervals. The total quantity remaining the same there is no use of giving it to him in a continuous flow of doses, night and day, at so much per second. And this is just what a hydro installation would do. From the report of the Chief Engineer for Electricity it appears that about 1,000 million cubic feet are to be let out at the rate of about 33 million cubic feet per day after being used in the power-house at Papanasam. It is no doubt true that in the months from *April to June* this normal flow of water at the reservoir could be sent down as proposed to the tanks under the last two anicut systems to be kept and stored there. This water will naturally be used up for transplantation during the months of *July and August*. Thereafter the needs of irrigation in the various systems are altogether different from the needs of electricity. While I feel unable to give the actual quantities required, it is clear that in August and September the demands of irrigation require on certain days large quantities of water, whilst on other days they may not require any. I fail to understand how regulated supply in driblets from day to day as stated above would be enough to meet the requirements in large quantities of irrigation in certain definite periods, and at any rate how it would not interfere with the normal requirements of irrigation. And if you take into account not merely the last two anicuts as has been done by the Chief Engineer for Irrigation but the other anicuts as well, I would like to be assured with facts and figures as to the actual quantities that would be let out at definite periods from the reservoir and the quantities that irrigation would require in the various systems before I can feel confident that existing supply to irrigation would not be interfered with. The matter is of such vital importance that sufficient light should be thrown on this aspect of the problem before one can take for granted that existing supply would not be interfered with because any interference is sure to be met with serious consequences besides the risk of litigation on the part of the ryots who would be affected.

16. The next question is how far the proposed project will provide for the deficiency of irrigation. The Chief Engineer for Irrigation has dealt with this aspect of the problem in two ways. He deals with it in two instalments so to say, just to find out what the deficiency in any particular anicut system is and then to see how far this deficiency is provided for by the normal issue of water in the reservoir by reason of the flow used up for generating power and the available for irrigation. This has been done with reference to the Srivaikuntam anicut system in Table C to his report. Secondly, from the deficiency in this system he has calculated the total deficiency in both the Srivaikuntam and Marudur anicuts in the proportion of their respective acreage and after obtaining the total deficiency in the two systems, he finds out how far it will be possible to issue abnormal supplies from the reservoir depleting it to the maximum extent possible such supplies

being paid for by the Irrigation department to the Department of Electricity. It is suggested that when such supplies are made and the reservoir is depleted very substantially the steam plant is to supply the loss of power in the hydro-electric plant thereby making good such loss. The payment referred to above is intended to make good the same. I shall deal with these two aspects dealt with by the Chief Engineer for Irrigation before I proceed further.

17. The following figures given in Table C to his report show the following position with respect to the Srivaikuntam anicut :—

Table C.

Year. (1)	Deficiency at Srivaikuntam in m. c. ft. (2)	Serial number for reference below (3)	Advantage obtained from the reservoir in m. c. ft. (4)
1908	1,300	1	60
1909	970	2	340
1910	2,001	3	840
1911	839	4	839
1912	1,077	5	726
1913	1,312	6	452
1914	615	7	355
1915	.	..	..
1916	130	8	130
1917	1,325	9	305
1918	1,980	10	280
1919	..	..	..
1920	..	..	..
1921	876	11	558
1922	..	..	..
1923	..	..	..
1924	..	..	..
1925	160	12	160
1926	..	..	..
1927	212	13	104
1928	1,647	14	297
1929	..	..	..
1930	360	15	Nil.
1931	..	..	Nil.
1932	..	..	Nil.
1933	..	..	Nil.
1934	1,835	16	775
1935	1,850	17	320

18. Out of the 17 years numbered serially above, it will be seen that the advantage gained by reason of the reservoir, i.e., by the normal issue of water therefrom is as follows :—

(*a*) full relief in three years, i.e., Nos. 4, 8, and 12;
(*b*) nearly half or more relief in four years, Nos. 5, 7, 11, and 13;
(*c*) very little relief in nine years, Nos. 1, 2, 3, 6, 9, 10, 14, 16 and 17; and
(*d*) no relief in one year, i.e., No. 15.

19. Before I go further, I feel sceptical about the figures of deficiency given in Table C. According to them, out of 28 years, there is no scarcity at all in 11 years. That is opposed to facts. We are told by the Chief Engineer for Irrigation in G.O. No. 1286 that every year 15,000 acres, every second year 30,000 and every third year 45,000 acres suffer badly. Therefore, to rely upon the figures in Table C and say that in 11 out of 28 years there is no deficiency and in some of the other years like Nos. 8, 12 and 13, the deficiency is very little like 130, 160 and 212 million cubic feet, would not, in my opinion, be safe. On the other hand, it is difficult to reconcile the two statements. It would have been very much better if one could find out the acreage where the crops failed and the extent of failure and then to have calculated the deficiency.

20. But even taking the figures in Table C as they stand, I should think that the relief afforded by the reservoir is very small. If, out of 17 years of scarcity, full relief is afforded only in one year, half and more in four years and the remaining 12 left with little or no relief, I cannot say that that is an achievement on which we should feel happy.

21. If on the other hand we had in the reservoir an extra 1,000 million cubic feet to our credit from which we could draw whenever necessary without having recourse to abnormal issues (and the consequent depletion of the reservoir which means interference with and reduction of power production at the hydro installation and the abnormal output of power at the steam station). I feel that, whilst the problem may not be fully solved, the position whether from the view point of electricity or of irrigation is certainly more safe and sound. Let me work out this in figures and show how it is. Dividing 1,000 million cubic feet as proposed in the Chief Engineer for Irrigation's note between

Srivaikuntam and Marudur in the proportion of 7 : 4 (i.e., in the ratio of the irrigated areas under the two systems), the quantity available would be 571 million cubic feet and allowing for loss in transmission at 25 per cent the net quantity available would be 430 million cubic feet. Add this to the advantage in Table C and we would find the following result :—

Serial number.	Year.	Deficiency.	Former advantage.	Adding 430 extra.
1	1908	1,300	60	490
2	1909	970	340	770
3	1910	2,001	840	1,270
5	1912	1,077	726	1,156
6	1913	1,312	452	882
7	1914	615	355	785
9	1917	1,325	305	735
10	1918	1,980	280	710
11	1921	876	558	988
13	1927	212	104	534
14	1928	1,647	297	727
15	1930	360	..	430
16	1934	1,835	775	1,205
17	1935	1,850	320	750

By this arrangement, the years 5, 7, 11 and 13, which previously had half or partial relief have now got full relief, and No. 15, where there was no relief has become also a year of full relief, i.e., in addition to the three full relief years of paragraph 17 above five more years have been given full relief, i.e., 8 years out of 17. Again in the five years 2, 3, 6, 9 and 16, where formerly there was little relief, we have now 50 per cent and more. And even in the four years that remain, viz., 1, 10, 14 and 17, the relief varies from about one-third to one-half. I should certainly consider that the position is much safer than before.

22. I shall now proceed to deal with the proposal of Chief Engineer for Irrigation to make up the deficiency by issuing water from the monsoon surplus as well as by depleting the reservoir and making extraordinary supplies therefrom. This has been worked out by him in Table D. To avoid reference to the Table I shall quote below some of the columns relevant for our purpose. The last column is added on by me.

Year. (1)	Net deficit with reservoir. (2)	Supplies in north-east monsoon from reservoir. (3)	Storage in reservoir on 1st August. (4)	Issues for irrigation from surplus. (5)	Issues from reservoir to be paid for. (6)	Deficiency still. (7)
1908	2,790	566	4,498	566	2,224	..
1909	1,418	..	3,336	..	1,256	162
1910	2,610	..	1,077	..	..	* 2,610
1912	790	2,941	3,236	790	..	..
1913	1,935	3,827	3,939	1,935	..	..
1914	578	6,945	2,363	578	..	..
1917	2,295	2,973	3,477	2,295	..	..
1918	3,825	856	5,215	856	2,969	856
1921	738	3,856	3,272	738	..	..
1927	266	2,615	5,495	266	..	..
1928	3,038	3,048	2,818	1,566	..	* 1,472
1930	810	5,234	4,693	810	..	..
1934	2,385	..	2,668	..	918	* 1,467
1935	3,442	2,591	645	1	..	* 3,442
					7,367	

* On account of low storage either it is not possible to issue at all or issue more than what is shown above.

23. Out of the 28 years of Table C, 11 years of nil deficiency and 3 years when by the normal issue of the reservoir, the deficiency has been wiped off, viz., 1911, 1916 and 1925 are excluded and the remaining 14 years alone are dealt with in Table D. To understand Table D, what has been done is the deficiency in Table C, which is the deficiency at Srivaikuntam, has been multiplied by $2\frac{1}{4}$ times and the total deficiency at both Srivaikuntam and Marudur is obtained after allowing for transmission losses as explained in the note to Table D. This deficiency is given in column (3) of this table [column (2) supra].

24. In the first place, except by way of illustration, I do not think it is very safe to depend upon these figures. The deficiency as shown rises to as much as 3,825 million cubic feet in 1918. In three years, it is over 3,000, and in seven over 2,000. It is well to remember that this is only for two anicuts. If we take the upper anicut systems, at least 4 out of 6 of them (leaving the first two) and assuming there is deficiency there also (as I have no doubt about it), the total deficiency would work to nearly double of what is shown in column (3) of Table D. This is because the total acreage under the

third to the sixth anicut systems is 31,670 acres (vide page 2 of G.O. No. 1286) whilst under the seventh and eighth, it is 41,698 acres. Though as per acreage it would be as 4 : 3, I would take it as 4 : 2 considering that the position of the upper anicut systems more favourable being nearer the source. That would mean that in the 14 years dealt with in Table D of the Chief Engineer for Irrigation, the deficiency would go up to as much as 5,738 million cubic feet and in many years to well over 3,000 million cubic feet. In this view the need for impounding a much larger quantity than what is provided for by Chief Engineer for Electricity becomes quite obvious.

25. Dealing with the figures in Table D, such as they are, at the outset I find it hard to believe that the reservoir could be depleted and extraordinary issues made from it to make up the deficiency as proposed in column (7) thereof. It is proposed to empty the reservoir to the maximum limit possible, make large issues of water for irrigation, pay for such issues and work the steam station to make up for loss of power. Many difficulties confront my mind at this juncture. The total of such issues, which by the way is possible in only 4 out of 14 years, is as follows :—

Year.	Quantity to be issued in million cubic feet.
1908	2,224
1909	1,256
1918	2,969
1934	918
Total ..	7,367

26. Though issued only in 4 years out of 28, this quantity is divided by 28 and an average issue of 263 million cubic feet is got. Calculated at 130 rupees per 1 million cubic foot, the average annual cost is stated to be Rs. 34,200. My difficulties are these and I can set them down only as a layman can. Would it be possible or wise to deplete the reservoir by making issues to such a large extent as in some of the years? For instance, in 1918, the storage is 5,215 million cubic feet. The monsoon surplus of 856 million cubic feet is issued as in column (6). From the balance in store as much as 2,969 million cubic feet is let out, leaving a balance of only 2,246 million cubic feet. In the year 1909, the net balance is only 2,080 million cubic feet. From page 4 (paragraph 24) of the Chief Engineer for Electricity's report, I find that the storage must exceed 4,000 million cubic feet. I suppose it is for the normal working of the hydro plant.

27. Let us assume it could be so depleted in August and September to make good the deficiency for the kar crop. If there are little or no rains at all in subsequent months, as I think, it happened this year what is to become of the reservoir and what is to become of any help to the deficiency for the pishanam crop? I think that 1,000 million cubic feet per mensem is required to work the hydro installation. Probably it could be worked for a month. Surely, it cannot be fully depleted. Even if it could work for two months, what next? Is the station going to be closed? If so, how long? Is it till the monsoon of the next year, if the north-east monsoon fails altogether? There is no use of swearing by the particular facts of the particular years of Table D. The facts may be the same till August. But subsequently they may change altogether. I fail to comprehend what is to become of the reservoir in such an eventuality and consequently of the working of the hydro installation. I take it that under such circumstances the pishanam crop will get no help whatever. Probably any normal flow in the river if used to fill the reservoir would only mean the cutting off even the existing supply to pishanam at the required time.

28. Pursuing the electric point of view, I fail to understand the exact position. The total output of power at the hydro station after the tenth year of working will be 27,000 h.p. and at the steam station I think it will be two plants (one as a standby) yielding 10,000 K.W. or 13,400 h.p. (1 K.W. = 1·34 h.p.). If it is to supply a normal deficiency of only 263 million cubic feet, I can understand some extra outlay on the steam plant to make good this deficiency. But if it is to be so much as 2,000 or 3,000 million cubic feet and that too in only four years out of 28, would it not require an extraordinarily large amount of capital investment to supply an abnormal quantity of power for which already large investments would have been made at the hydro installation? To take actual figures, to produce 27,000 h.p. at the hydro installation the capital investment on the dam, power station, plant, etc., is Rs. 181·66 lakhs. The total outlay on the transmission lines is Rs. 54·51 lakhs. Rightly a portion of this should be added to the 181·66 lakhs for it goes to add to the cost of power.

Power got at the place wanted is cheaper than power at a far off place like Papanasam and in the latter case the cost of transmission should be added. But for our present purpose even ignoring it, I should like to know to what extent by these abnormal issues the output of power would be reduced at the hydro installation. To supply this power, even though on very rare occasions, what is the actual outlay and cost of maintenance of the extra steam plant over and above the normal requirements of the steam plant necessary to make up this loss of power? These figures should be worked out to see how far these abnormal issues would cost financially. I do not think it is at all correct to estimate this at only Rs. 34,200 per annum at so much for 1 million cubic feet as has been done. Rs. 34,200 is the annual payment for the issue of only 263 million cubic feet. But in one year as in 1918, 2,969 million cubic feet would be required. That means a capital investment eleven times as great as would be required normally and annual interest and maintenance thereon, even though the necessity may be only in one year. And in addition to this the loss of interest and cost of maintenance on the hydro plants at the power-house as well as near the dam-site which will have to stand idle for the time being. And if it is so costly, is it all wise and prudent to invest so much, all because in 4 out of 28 years, we have to make such abnormal issues? On these and other aspects set out above, I would ask for sufficient light.

29. To proceed further, if Rs. 34,200 be the annual payment and it is possible to make such supplies, let me work out financially and in the result the difference between the state of affairs as set out in Table D with a reservoir as proposed and with one impounding 1,000 million cubic feet extra. Even as the figures stand in Table D, in the following years, either no abnormal issue is possible or if possible the deficit is not wiped out. They are :—

Year.	Net deficiency. M.C. FT.	
1909	162	(After issuing 1,256 million cubic feet).
1910	2,610	(Issue not possible).
1918	856	(After issuing 2,969 million cubic feet).
1928	1,472	(No issue possible),
1934	1,467	(After issuing 918 million cubic feet.).
1935	3,442	(No issue possible).

30. I think a 1,000 million cubic feet extra would improve the position. In 1909 and 1918, the deficit would be wiped off. In 1928 and 1934, it is reduced to less than one-third, in 1910 and 1935 to about two-thirds. The only trouble I find is that in the letter of the Chief Engineer for Irrigation, dated 23rd November 1937, he states that the supply in the river is adequate to impound 1,000 million cubic feet more in all the 28 years (1908—1935) except the five years, 1909, 1910, 1911, 1918 and 1934. He bases this on paragraphs 23 to 25 of the Chief Engineer for Electricity's report. But I do not find in these paragraphs anything to support that view or any material on which to find it. Even were it so, I should like to know whether the whole of 1,000 million cubic feet would be unobtainable or any portion of it and whether any extra storage of the previous year or months could not be carried forward and stored up. Even if nothing extra whatever could be got, which I do not think is the postion, the years 1928 and 1935, where no issues were possible under Table D, would become different with the storage of 1,000 million cubic feet extra.

31. Apart from this, if we know what exactly would be the extra storage possible in these five years, I think a financial calculation is possible in this way. The total issues to be paid for in the four years 1908, 1909, 1918 and 1934 amount as seen from Table D to 7,367 million cubic feet. If even in these years, it were possible not to go in for the whole of the abnormal issues but to use 1,000 million cubic feet as part of it, the payments would have to be for the following quantities :—

1908	Only	1,224	out of 2,224	million cubic feet.
1909	Only	256	,, 1,256	,,
1918	Only	1,969	,, 2,969	,,
1930	Only	Nil.	,, 918	,,
		3,443	7,367	

That means an average of only 123 million cubic feet instead of 263 million cubic feet as before, and the annual payment will be Rs. 15,990 or Rs. 16,000 as against Rs. 34,200. Rs. 34,200 capitalized at 4 per cent gives 8·55 lakhs whilst Rs. 16,000 gives 4 lakhs. In other words without an extra storage of 1,000 million cubic feet, we are paying interest on Rs. 8·55 lakhs. Whilst if we spend 14 lakhs, we can take credit for the saving of Rs. 4·55 lakhs out of this. If such a storage of 1,000 million cubic feet is not fully possible let us know what actually it is, and take credit for it proportionately. But I have already stated that in my view, for the extraordinary demand of power upon the steam plant amounting to ten or eleven times the so-called average deficiency, Rs. 34,200 does not at all represent a true or correct financial result.

32. Viewed from another standpoint, viz., of only 2,000 million cubic feet, as the net deficit every year for both the crops in the whole system as per G.O. No. 1286, dated 29th May 1936, and not the abnormal figures of column (3) of Table D (which again would be 1½ times if deficiencies in the upper four systems are to be taken) and considering also the statement in paragraph 24 of the report of Chief Engineer for Electricity that even for power purposes the storage must exceed 4,000 million cubic feet, it seems to me that a surplus of 1,000 million cubic feet would be a standing benefit all round in various ways. Firstly, it would be a standby which could be used to make up any interference with existing supply to irrigation as apprehended in paragraph 14 supra. Secondly, it would make many bad years good as I have attempted to show in paragraph 20 supra, as against the very little advantage which the reservoir as designed would confer. Thirdly, it would save an enormous amount of expenditure which, though I am unable to give out in actual figures, would inevitably be needed to invest on the extra steam plant, etc., as indicated in paragraph 27 above. Fourthly, without being able to say that a vexed problem which has cried for relief for over half a century has been fully solved, Government can face the suffering ryots of Tinnevelly fully and say that they have done their best to solve it as well as they can. And lastly even if it be an error to spend Rs. 14 lakhs more, it is an error committed on the safe side. Because, if it is not provided for now alone repentance would come too late. In a project costing Rs. 258 lakhs in all, I consider that an expenditure of Rs. 14 lakhs extra as worth the risk considering on the one hand the highly uncertain factors involved in the problem and on the other hand, the untold loss, hardship and misery to the ryot population year after year who certainly deserve better at the hands of a Government which takes the heaviest assessment from them. To my mind in a problem of this sort, Rs. As. Ps., should not be the only consideration.

33. Even with respect to the financial aspect of the problem, it is necessary to remember that the Rs. 14 lakhs we shall have to spend at the cost of irrigation is indeed little compared with the net revenue got from the Tambraparni system. On the first six anicuts little has been spent. On the last two there is an accumulated net surplus revenue of Rs. 76·34 lakhs till end of 1935–36 (see pages 113 and 146 of the Administration Report for Irrigation for 1935–36). Further whilst I am not versed with the technical rules of finance, I think we can take credit for the saving in the recurring expenditure almost every year upon the repair of flood damage in the system. I am told that roughly about Rs. 50,000 are spent on repairs to flood damage every year. Capitalized at 4 per cent this means Rs. 12·5 lakhs. Correct figures may be worked out and credit taken accordingly.

34. In the light of what I have set out above, I think that the Chief Engineer for Irrigation should be requested to advise upon the matter. I also think that a report from the Collector of the district in respect of some of the points touched upon above would be helpful in coming to a decision.

IX

Note by the Chief Engineer for Irrigation, dated 16th February 1938.

NOTE A.

[Papanasam Hydro-Electric Project.]

The proposal is to install immediately three turbines, 9,000 h.p., each or 27,000 h.p. (20,100 K.W.)—see paragraph 6 of the printed report. In addition, as the load grows, three steam-driven generators of 5,000 K.W. each (21,000 h.p. in all) will be installed near Madura.

The peak load expected in the tenth year of operation is 20,600 K.W. (Table V, last column). The average load is only 12,360 K.W., but the peak load (which may occur only for some hours a day) has to be catered for. The reason why there is such an apparent disparity between the installed capacity of the plant and the average load is that—

(*a*) the peak load must be allowed for; and

(*b*) there must be an adequate reserve to meet the contingency of breakdowns when the peak loads are on.

The two stations will operate to suit varying conditions of river-supply as shown below:—

(1) Natural flow in the river is copious and is sufficient to work (three or more hydro turbines and no assistance is required from the reservoir.

Average load.—12,360 K.W. will be met by two hydro turbines (capacity 13,400 K.W.).

Peak load.—20,600 K.W. will be met by—

(*a*) Two hydro turbines (13,400 K.W.); and

(*b*) two steam generators giving 7,200 K.W.

Extraordinary peaks.—(*a*) two hydro turbines (13,400 * K.W.); and

(*b*) two steam generators, 10,000 K.W.

* Even not taking into account the 20 per cent overload capacity of the plant.

(2) Natural flow in the river is low and issues have to be made from the reservoir to keep up a minimum of 31 million cubic feet—this is the normal draw from the reservoir—per day and the reservoir level is high enough to enable the necessary issues being made.

Average load.—12,360 K.W. will be met by—

(*a*) one turbine on part-load 2,360 K.W., or more; and
(*b*) two steam generators (10,000 K.W.).

Peak load.—20,600 K.W.—

(*a*) Two turbines (13,400 K.W.) load taken 10,600 K.W.; and
(*b*) two steam generators (10,000 K.W.).

Extraordinary peaks—

(*a*) Two turbines, 13,400 K.W.; and
(*b*) two steam generators up to 10,000 K.W.

As the hydro plant will draw much less than 31 million cubic feet under average load conditions, the peaks for a few hours at a time can be met as shown above without exceeding on the whole 31 million cubic feet in a day.

(3) Natural flow in the river is low and the reservoir level is also low. The daily flow through the turbines including reservoir issues is below 31 million cubic feet—say 15 million cubic feet per day.

Average load.—12,360 K.W.—

(*a*) Two steam generators, 10,000 K.W.; and
(*b*) one turbine at 2,360 K.W.

Peak load.—20,600 K.W.

(*a*) Two steam generators, 10,000 K.W.; and
(*b*) two turbines (capacity, 13,400 K.W.), actual 10,600 K.W.

Extraordinary peaks—

(*a*) Two steam generators, 10,000 K.W.; and
(*b*) two turbines (13,400 K.W.).

In this case also, the total output of the hydro plant will be so regulated as not to exceed the available water-supply of 15 million cubic feet per day.

The above is what I conceive is the proposal of the Electricity department. Major Howard may be requested to verify if the interpretation is correct.

With my proposal the initial installation should consist of three turbines and three steam generators—whatever extra is needed may be added later as experience of working conditions is gained.

NOTE B.

[The proposal to reduce the base width of dam by reducing the provision for uplift in the design.]

The Hydro-electric department has designed the dam on the assumption that it will be subjected to half uplift. This is normal practice. If the foundation rock is absolutely solid and unfissured theoretically, one should not expect uplift but sound unfissured rock is seldom met with. Similarly at the other sections higher up; provided the workmanship is perfect, one can design on the assumption that there is no uplift. However, it is probably cheaper to allow for uplift than to pay for the perfect materials and perfect supervision required to ensure that there will be no uplift. The Papanasam dam is over 170 feet high and dams of this height are structures with which one is not justified in taking any risk.

Review of the Parliamentary Secretary's note by the Chief Engineer for Irrigation.

Paragraph 1.—Rs. 181·66 lakhs mentioned in the paragraph is the total cost of hydro and steam plant installations and not of hydro plant alone. The average power when the scheme fully develops is only 16,000 h.p. approximately. The rest of the installed horse-power is to take peak loads and serve as a standby—vide paragraph 28 below.

Paragraph 2.—No remarks.

Paragraph 3.—It may be noted that people who were so clamorous about the constant deficiency of water, (1) were not willing to contribute anything by way of an increase in assessment for the extra benefit they would receive, and (2) were paying apparently double crop assessment for lands that hardly ever grew, two crops successfully when they could have applied for converting the lands into single-crop wet.

There is as usual an element of exaggeration in the ryots' representations.

Paragraph 4.—This refers to paragraph 3 of Government Memorandum No. 3436-D/37-1, P.W.D., dated 16th October 1937.

Paragraph 5.—This refers to the Chief Engineer for Irrigation's reply sent to the above memorandum.

Paragraph 6.—Mentions the issues to be considered.

Paragraph 7.—This may have been the case to some extent before 1912. But after improvements to the south main channel, Attur, Kiranur, and Peikulam tanks and the Attur supply channel were subsequently carried out, matters have considerably improved. The remission figures show that failure is not now widespread. In the Tinnevelly District Gazetteer, dated 1916, the following statements are found :—

> *Page* 169.—On 94 per cent of the area, two crops are raised in all good years. . . . Under seven upper anicuts remissions were rare and even during the famine year 1876–77, Tambraparni gave a bountiful supply.
>
> *Pages* 176 *and* 177.—Speaking of Srivaikuntam, it says "The crucial period is from June to mid October, the season for kar crop . . . The freshes when they come are often too late to enable the ryots to start their kar cultivation in time to admit of their fields *being ready by November* for the pishanam crop. The pishanam is *then* delayed and there may *in that* case be no water to mature it in March; on the other hand there has seldom been any lack of water during the north-east monsoon. The Srivaikuntam system accounts in most years for more than two-thirds the remission granted on the whole Tambraparni valley."

The remarks in pages 178 and 179 show that the Papanasam project was mainly considered as a help to the Srivaikuntam anicut system.

Please also see statement of Collector of Tinnevelly in 1935—quoted in paragraph 12 of the note under reply. Though the assessment for the highest class lands is as high as Rs. 22–8–0, the average water-rate is only Rs. 7 for two crops—vide details for Srivaikuntam anicut system.

Figures for fasli 1345 (1935-36), *Appendix II of Administration Report.*

Area charged as irrigated first crop 25,845, second crop 12,802, Net Revenue for irrigation —Rs. 2,21,052.

Water rate per acre assuming half rate of first crop for second crop is Rs. $\frac{2,21,052}{25,845 + 12,802} \times \frac{1}{2}$ = Rs. 6·9 or say Rs. 7,

There is nothing to show that there is a constant scarcity of water for half a century or that the bulk of the pishanam ayacut gets destroyed.

Paragraph 8.—There are no recorded facts and figures to support the remarks made in paragraph 2 on page 2 of the Government Order. Records of this office show that this statement is based on an impression of Mr. N. Parameswaram Pillai who was an Executive Engineer in Tinnevelly for some years and who was the Deputy Chief Engineer in this office at the time the project was taken up for consideration in 1933. There are no data to substantiate this remark and the figures are undoubtedly exaggerated. The statement means that 15,000 acres fare very badly every year and 30,000 acres in two years out of three. It is impossible to believe, that any ryot would go on paying double-crop assessment for years on lands which do not yield or yield poorly in two years out of three over nearly 50 per cent of the double-crop area. That was why in examining the scheme now I had to discard this statement and look for more reliable data such as the supply available from year to year at Srivaikuntam anicut to work out the deficit. A perusal of the report and correspondence in this Government Order will clearly show that the scarcity felt is under the last two anicuts and in the kar season.

Paragraph 9.—No remarks.

Paragraph 10.—No remarks.

Paragraph 11.—It is impossible to agree with Mr. Karant in his interpretation of the Government Order. If as he contends, the intention of Government was that the scheme should provide for full irrigation requirements nothing would have been easier for Government than to have sanctioned the scheme as then submitted as it provided for irrigation requirements and was recommended by the Board of Revenue and Irrigation Development Board. Government stated "the scheme cannot be sanctioned as part irrigation project" and turned down the project with instructions to investigate a remunerative hydro-electric scheme. Besides they wanted to test the hydro-electric scheme in actual working before estimating the help it gave to irrigation and deciding what credit may be afforded to the hydro-electric project. This procedure would be unusual for a project designed to provide for the full needs of irrigation. It seems to me therefore clear that Government's intentions were to estimate for a hydro-electric project making due provision for the rights of existing irrigation and if the remunerative hydro-electric scheme as designed gave indirectly help to irrigation, such help should be assessed and credit afforded on the basis of help derived by irrigation from the hydro-electric project.

Paragraph 12.—Calls for no remarks.

Paragraphs 13 *and* 14.—The remarks in paragraph 13 if based on the statement that 45,000 acres fail once in three years, are substantially correct. As pointed out, this statement is merely a record of the general impression of one officer, unsupported by figures. Besides the references given in paragraph 7, the remarks in paragraphs 5 (page 14), 2 (page 16), 2-a (page 18), 6 (page 19), 4 (page 20), 6-a (page 21) in the Government Order of 1936 will show that scarcity of supply is felt only in Tiruchendur and Srivaikuntam taluks, i.e., under the Marudur and Srivaikuntam anicuts and that in the kar season —vide also paragraph 6 of the memorandum of the Tinnevelly District Landholders' Association in page 19 of the Government Order. From Collector's letter L. Dis. No. 5816/37, dated 27th November 1937 (copy enclosed) it is clear that no figures are available in the Collector's office to show what areas or what anicuts felt the scarcity.

Any small scarcity in the pishanam season will easily be made good even by the reservoir with the designed capacity of 5,500 million cubic feet as there is always a special issue for power from the reservoir between 15th February and 15th March. Besides it is expected that both the kar and pishanam seasons will begin and end earlier due to the material assistance given by the power draft earlier in the season. This will be greatly to the advantage of the ryots. During my tour in Tinnevelly district in September 1937, I was informed that 1937 was one of the very worst years on record. It would not therefore be safe to generalize on the experience of this one year or of a year like 1910. No reservoir scheme can be designed to provide for such abnormal years. Even Mettur would fail in years like 1918 and 1929.

Paragraph 15.—The basis on which the working tables are prepared are explained under 'B' on pages 50–51 of the hydro-electric report. Since only the surplus over the last anicut (Srivaikuntam anicut) that will otherwise run to waste will be impounded in the reservoir it is clear that *existing* irrigation rights are not in the least interfered with. There is no proposal to impound any portion of the supply at present utilized for irrigation or to impound all supplies required for irrigation in the reservoir and then let them out as and when required for irrigation. Government wanted to know if the *existing* irrigation rights will be affected. The answer is definitely "*No.*"

There seems to be a confusion of ideas in this paragraph. The idea is not to limit the issues at the power house to a 33 million cubic feet. (31 million cubic feet to be more accurate) a day. This will be the minimum flow in the river at the site on any day. If the natural flow in the river above the power house site is greater than 31 million cubic feet and if all the natural flow is required for irrigation, nothing will be arrested in the reservoir, the whole flow will be let down partly over the diversion weir and partly through the power house. If the natural daily flow is less than 31 million cubic feet the deficit will be issued from the quantity stored in the reservoir on days when the river flow was in excess of requirements (irrigation or power whichever was greater) and the excess would have run to waste into the sea. It is clear that there will be absolutely no reduction in the supply available for irrigation at present. On the other hand there will be this distinct gain, that a minimum daily flow of 31 million cubic feet will be maintained in the river at the power house site even when the natural flow falls below this. It is also to be remembered that this 31 million cubic feet is in addition to the flow that is contributed by the large catchment of the river downstream of the power house.

Paragraph 16.—No figures are available for the day to day draw off by the Marudur anicut. Hence the deficiency for the Srivaikuntam channels is estimated from the available figures and the deficiency at Marudur is assumed to be in the same proportion. This is an error on the safe side, since Marudur anicut must draw a greater proportion of the river supply than Srivaikuntam and its deficiency will be less.

Paragraphs 17 *and* 18.—No remarks.

Paragraph 19.—Mr. Karant's scepticism is due to his pinning his faith on paragraph 2 of the Government Order of 1936 for which there is no reliable data. The Collector has stated that during the eleven years prior to 1935 there was scarcity in five years in the Tiruchendur and Srivaikuntam taluks (vide paragraph 2 on page 16 of the Government Order). Table C prepared on the basis of actual supply figures available also shows the number of years of inadequate supply in this period to be five. An examination of the whole period of 28 years gives the number of years of inadequate supply as 17 which is roughly in the same proportion. Table C therefore appears to represent actual conditions in the past.

Paragraph 20.—No doubt the reservoir without help from the steam plant will not materially improve matters. It is however to be remembered that a larger reservoir will not improve the position appreciably as in some consecutive bad years the river flow is very poor and no reservoir of any reasonable capacity will be of greater benefit than the reservoir proposed for 5,500 million cubic feet. The point to be considered is whether the benefits from a larger reservoir are commensurate with the additional expenditure required to build it. The table on page 19 of Mr. Karant's note shows that small deficits, e.g., those shown in Mr. Karant's Nos. 5, 7, 11, 13 and 15 can be made good even with the present reservoir and without calling on the steam plant by improving the storage of the tanks in Tambraparni system and fully impounding the power draft in March to May instead of allowing a part of it to be wasted owing to want of adequate storage capacity. I have asked the Superintending Engineer to examine this question.

Paragraph 21.—The statement in this paragraph is not quite correct. In the case of years 3 (1910), 5 (1912) and, 17 (1935) there will be absolutely no improvement with a larger reservoir, as there was no surplus in the previous year available for filling in the larger reservoir. An addition of 1,000 million cubic feet to the storage capacity is bound to improve matters but the same and even greater advantage is gained in all but four years by depleting the reservoir in anticipation of the north-east monsoon floods and working the steam plant if the monsoon fails. Even in the four years (see Table D) we get the advantage of a larger reservoir but have to pay for it. The point is whether the extra benefit from a larger reservoir is commensurate with the additional expenditure and whether it cannot be secured more cheaply in the way suggested in my last note. The working table for three years (1908 to 1910) prepared for a reservoir of 6,500 million cubic feet capacity shows that the reservoir will be empty from April to October 1910.

Paragraphs 22 *and* 23.—No remarks.

Paragraph 24.—In the face of the many statements that scarcity is only felt in Tiruchendur and Srivaikuntam anicuts it seems unnecessary to give prominence to the rare and occasional shortages observed in the upper anicuts in very bad years when the monsoon and river flow is much below normal like 1937. For example, in a very bad year like 1934 for which figures have been furnished by the Executive Engineer the flow in the channels taking off from the three anicuts above Marudur anicut was 454 million cubic feet in September. The kar crop under these channels was only 19,509 acres. Assuming the crops have to be given a watering of 6 inches the quantity required is only 425 million cubic feet which they had. Even taking August and September the quantity drawn by the channels gave nearly 21 inches in 60 days or a continuous supply duty of 70 (ignoring all rainfalls) which may be considered quite favourable in a bad year. There cannot therefore have been any real scarcity even in this bad year in the upper anicuts. To assume therefore that the total deficit in a year like 1918 or 1928 will be something like 6,000 million cubic feet is not warranted but if there is such a deficiency then an extra 1,000 million cubic feet is not going to help.

Paragraph 25.—If it is assumed that issues can be made with the intention of subsequently making them good by running the steam plant if necessary, issues are possible in 12 (and not 4) out of 14 years; only in four years payment will be made. In the other eight years no payment will be required as the advance issues from the reservoir will be made up by the subsequent floods of the north-east monsoon. Mr. Karant's assumption that issues can be made in only 4 of the 14 years is incorrect; issues can be made in 12 out of the 14 years; and in these two years no issues could have been made even with the larger reservoir suggested by him even though he works the steam plant.

Paragraph 26.—There is some miscomprehension in this paragraph. What paragraph 24 of the report says is that the storage capacity of the reservoir should be more than 4,000 million cubic feet to suffice for power during a year and to be of appreciable assistance to irrigation and not that the storage should not at any time be allowed to get less than 4,000 million cubic feet. This will be evident from a perusal of the working tables (for seven years—1908–1914) on pages 52–55 of the report where the storage in the reservoir is allowed to fall as low as 126 million cubic feet in October 1911, 397 million cubic feet in June 1911, etc.

Paragraph 27.—It is not the intention to deplete the reservoir fully. The limit fixed is a minimum of 1,000 million cubic feet on 1st October. The assumption that all the requirements for power in subsequent months will have to be drawn from the reservoir is incorrect. Taking the seven bad years for which working tables are available, the total natural flow at the power house site in the months October to June is as under :—

1908–09	11,098	1911–12	21,133
1909–10	7,958	1912–13	19,056
1910–11	15,928	1913–14	18,136

The quantity required for power in this period is about 8,500 million cubic feet. Hence there is not likely to be any failure of the hydro plant especially as the intention in years of special issues is to utilize the steam plant to the extent of making up the issues not covered by subsequent surplus.

The impression that the normal flow in the river will be impounded in the reservoir when it is required for irrigation, is wrong : Only when there is surplus at Srivaikuntam anicut is the natural flow interfered with, when there is no surplus the natural flow in the river is passed through the reservoir.

Paragraph 28.—This paragraph is also based on a misunderstanding of the scope of the scheme. The provision is for the development of an average 9,000 h.p. (at the hydro electric station) + 6,700 h.p. (at the steam plant station) or a total of 16,000 h.p. (approximately). This can be developed by 1 unit at each of the stations out of the 3 units installed. The second unit is for use during the few hours of peak lead. This third unit is a stand by. What will be done is this—

> Take 1909 as an illustration. One thousand two hundred and fifty-six million cubic feet was issued specially for irrigation in September 1909 and on the 1st October the storage was 1,000 million cubic feet. The natural flow sufficed to run the hydro plant till the second half of February 1910. In this period the reservoir stored about 1,060 million cubic feet in addition, even allowing for losses in evaporation. From that date water will be required for power in varying quantities till 15th July. The total quantity required was roughly 3,000 million cubic feet against (1,000 + 1,060) or 2,060 million cubic feet in the reservoir. The daily issue for power being about 31 million cubic feet issues will be limited to 21 million cubic feet and the hydro plant will be run to develop an average of 6,000 h.p. instead of 9,000 h.p. (normal) the balance of 9,700 h.p. will be taken up by the two steam plant sets (6,700 h.p. each) out of the three installed. This will go on for four or five months after which the natural flow will allow the hydro plant to take a larger load. The same would be the case even with a reservoir for 6,500 million cubic feet or 1,000 million cubic feet bigger. The position early in 1911 becomes much better as there was then a storage of nearly 3,500 million cubic feet to meet the demands of the season from February to June. Later in 1911 irrigation needed no help as the supply was good and the reservoir functioned as usual.

The average load in such conditions may be met by working two steam units and the hydro plant will take up only the peak loads. In this connexion it is also to be remembered that the need for this will not occur until after the load has developed considerably and the problem is not likely to arise in the first half a dozen years. Beyond installing the full plant required for the hydro electric scheme considered *per se* to begin with, i.e., to say three turbines and three steam generators, there will be no need to increase the number of steam units or increase the capital outlay. It is also to be noted that in any extraordinary and most unlikely contingency, power for short periods can presumably be diverted from Pykara as the two systems will be linked at Madura. The point to be noted is that even the larger reservoir will not in the conditions envisaged by Mr. Karant alter the position at all if the extra storage is earmarked for irrigation.

Paragraph 29.—Inclusion of 1918 in the list is incorrect. There will be no deficiency in 1918. The quantity that will be issued is 3,825 million cubic feet of which 856 million cubic feet is made up by subsequent surplus and 2,969 million cubic feet is paid for.

Paragraph 30.—The 1,000 million cubic feet extra will improve the position only to the extent shown in Table E newly prepared. For this small benefit the extra annual cost will be Rs. 37,530.

It will also be seen from Table E that the average assistance given by the reservoir in the 14 years we need its help, may be gauged from the following figures :—

(*a*) *Deficits with no advance issues and steam plant not used.*—

(1)	(2)	(3)	(4)
5,500	6,500	7,500	Reservoir capacity.
1,923	1,283	874	Average deficit million cubic feet.

(*b*) *Deficits when advance issues are made and the steam plant is used in case north-east monsoon is below normal.*—

654	511	444	Average deficit million cubic feet.

These figures show that proposal (*b*) (1), i.e., the proposal to draw water in advance from the 5,500 reservoir and work the steam plant later confers far more benefit that proposal (*a*) (2), i.e., the proposal to enlarge the reservoir to 6,500 million cubic feet and not work the steam plant. In fact the 5,500 million cubic feet reservoir using the steam plant is more helpful to irrigation than a reservoir of 7,500 million cubic feet without a steam plant.

In 1909 the deficit of 162 million cubic feet could not be made up even with the larger reservoir, for there was not adequate surplus in the north-east monsoon of the previous year from which to fill the extra storage of 1,000 million cubic feet. (The surplus in 1909 was only 566 million cubic feet and this had to be utilized to make up the special irrigation issue in September 1908).

The larger reservoir will not reduce the deficit in 1910 or 1935 for even though the reservoir is larger by 1,000 million cubic feet there was no surplus in the north-east monsoon of 1909 and 1934 to fill it. The whole of the 1,000 million cubic feet was unobtainable in 1909, 1910 and 1935 and there was no extra storage even from the previous year to be carried forward, because in 1908, 1909 and 1934, special issues had to be made for irrigation.

Paragraph 31.—The financial implications with different sized reservoirs (5,500 million cubic feet, 6,500 million cubic feet, and 7,500 million cubic feet are now worked out and shown in the new Table E. The figures given in paragraph 31 of the note are not correct. Even with the larger reservoir in 1909 payment will have to be made for 1,256 million cubic feet as there would be no extra storage in the reservoir due to want of adequate surplus in the previous season. In 1934 payment will have to be made for 918 million cubic feet as even with the increased reservoir of 6,500 million cubic feet there will be a deficit of 1,385 million cubic feet of which only 918 million cubic feet could be issued from the reservoir and this will have subsequently to be made good by using the steam plant. The financial calculations made in this paragraph should therefore be revised as per table E.

Paragraph 32.—The conclusions come to in the paragraph have been shown above to be not correct—

(i) The figure 4,000 million cubic feet given as the minimum storage to be reserved for power is not correct, the storage may be reduced to any extent. All that the Chief Engineer for Electricity said was that the capacity of the reservoir must be greater than 4,000 million cubic feet to obtain the most efficient scheme. Having fixed the capacity, he has not placed any limits on the extent to which the storage may be drawn on.

(ii) There will be little or no deficiency ordinarily in the upper systems.

(iii) The increased cost of the scheme by enlarging the reservoir will not be commensurate with the benefits obtained from the larger reservoir.

(iv) There will be absolutely no interference with existing irrigation supply.

(v) There will be no additional capital expenditure by way of any increase in the units of steam plant to be installed.

(vi) Even with the reservoir of 5,500 million cubic feet there will be some benefit and this will be increased when the existing tanks in the system are improved.

(vii) If cost is no consideration, we can as well enlarge the reservoir by even two or three thousand million cubic feet. The benefits from a reservoir of 7,500 million cubic feet will be greater than from one of 6,500 million cubic feet.

	Lakhs.
* Surplus revenue of Srivaikuntam system	1·92
Surplus revenue of Marudur system.	38·79
Total ..	40·71

(The figure of 76·34 lakhs given by Mr. Karant is not correct. It is not accumulated surplus but total net revenue realized without making any deduction for annual interest on capital outlay.)

	Rs.
† Net loss in Srivaikuntam anicut—	
1935–36 (column 18, page 44 of Administration Report) ..	8,681
1934–35 (column 18, page 48 of Administration Report) ..	87,988
1933–34 (column 18, page 46 of Administration Report) ..	41,577
1932–33 (column 18, page 46 of Administration Report) ..	1,88,639
1931–32 (column 18, page 44 of Administration Report) ..	39,086

	Cusecs.
‡ Discharge in High floods—	
1923–24	176,320
1931–32	173,497
1925–26	169,382
1933–34	127,142
1914–15	108,121

Paragraph 33.—As seen from C II statement on pages 43–44 of the Administration Report for 1935–36, there is no doubt large accumulated surplus * revenue in the case of Marudur system, but the Srivaikuntam anicut system is working at a loss†

The reservoir will have little or no effect as a flood moderation in view of its limited capacity of 5,000 ‡ million cubic feet.

A high flood such as what causes damage will fill up the reservoir in a few hours, even if it happens to be empty. The maximum flood discharge at Srivaikuntam was as high as 176,320 cusecs in 1923–24. Again high floods occur mostly in the north-east monsoon while the floods in the reservoir site are generally in the south-west monsoon. It is therefore not likely that the damages due to floods will be appreciably less after the construction of the reservoir.

Paragraph 34.—I forward for information copies of my letter No. 709/37-B-11, dated 17th November 1937, to the Collector and his reply L. Dis. No. 5816/37, dated 27th November 1937, from which it will be seen that the Collector cannot throw much light in the matter. It is not known if any reliable information can be had from the taluk records. In view, however, of my remarks below, I do not think that it is necessary to pursue this line of investigation.

The position may now be summed up as follows :—

(*a*) It will be seen from paragraph 30 above that there is little advantage attaching to a bigger reservoir. The 5,500 million cubic feet reservoir making use of the steam pant is more helpflul to irrigation than even a 7,500 million cubic feet reservoir without the steam plant.

(*b*) In practically all bad years, power draft from March to May exceeds 2,000 million cubic feet. As storage capacity in the delta tanks is limited, the net effect is only about 900 million cubic feet on the crop. About 360 million cubic feet is issued as power draft over and above the natural flow in the river in June to September in bad years. Thus the reservoir helps irrigation to the extent of 1,260 million cubic feet normally without using the steam plant. The proposal to use the steam plant adds to this an average 1,265 million cubic feet as follows : —

(i) An average issue of 740 million cubic feet from the reservoir which is made good by the north-east monsoon floods, which would have surplussed otherwise, and

(ii) an average issue of 525 million cubic feet which has to be paid for, as steam plant has to be worked. The total benefit to the delta by the proposed method of working is thus about 2,525 or 2,500 million cubic feet against 1,500 million cubic feet assumed in the 1935 calculations as required for watering

45,000 acres of bad kar crop. The 2,500 million cubic feet is all issued from stored supplies or supplies which can be stored and later drawn upon and will be therefore available as and when required by the crops. The reservoir as now proposed to be worked is therefore definitely a better proposition in every way than the 1935 scheme.

(*c*) Assuming that in some bad years (1937 is one of the worst on record by the way) lands irrigated by the upper anicuts are really in need of help and the 1935 calculations which are admitted to provide for them again hold good, there is a margin of 1,000 million cubic feet between the 1,500 then calculated to be required and the 2,500 now available. All that is necessary is to divert a part of the special issues or power draft at the upper anicuts. There would be still sufficient water for the Srivaikuntam and Marudur anicuts.

(*d*) The position will be improved if the kar crop can be started in April or early in May in the Srivaikuntam and Marudur systems. This will enable a part of the summer power draft which has now to be wasted to be utilized. A note in the *Hindu* of 1st February 1938, from its Tinnevelly correspondent says that the ryots are agreeable to such advance and that the Revenue authorities have been made aware of their willingness to advance the season. Another possibility is a three-month crop on a part of the ayacut, similar to what is now grown in Trichinopoly channels, from March to June. Increasing the storage capacity of the delta tanks will also add to the available supplies. These aspects are being further investigated.

In the above circumstances, I am unable to recommend any deviation from the proposal already made. This proposal is definitely superior to the 1935 proposal to which there was no objection by the ryots. If the ryots still insist on the larger reservoir then in fairness to the general tax-payer, they should pay for it. The compounded double-crop area is roughly 60,000 acres. The extra cost of enlarging the reservoir is 14 lakhs, the contribution required per acre is Rs. 24.

Enclosures.

(1)

Letter from F. M. Dowley, Esq., M.I.C.E., Chief Engineer for Irrigation, to the Collector of Tinnevelly, dated Madras, 17th November 1937, No. 709/37-B-11.

[Papanasam Project. *Reference.*—Your letter No. A.-3-1049/35, dated 10th September 1935.]

Kindly refer to paragraph 2 of the above letter and let me know the five years in which you considered supplies were inadequate for the kar crop out of the eleven mentioned.

(2)

Letter from the Collector of Tinnevelly, to the Executive Engineer, Tinnevelly, dated 27th November 1937, No. L. Dis. 5816/37.

[Irrigation—General—Papanasam reservoir project. *Reference.*—Letter from the Chief Engineer for Irrigation, No. 709/37-B.-11, dated 17th November 1937.]

A copy of the reference received from the Chief Engineer for Irrigation is enclosed. In paragraph 2 of this office letter No. A.-3-1049/35, dated 10th September 1935, it was reported that during the past eleven years there had been inadequate supply of water in five years for the kar crop in the Srivaikuntam and Tiruchendur taluks. The information required is not available in this office but it appears that Part II of the Administration Report of the Irrigation Branch for each official year supplied by you has been consulted in the matter. Please furnish the information wanted direct to the Chief Engineer with reference to (i) the areas irrigated under the Srivaikuntam and the Marudur anicuts during the eleven years preceding 1935, (ii) the net revenue derived from the two systems, and (iii) the water levels at the Srivaikuntam and Marudur anicuts during the kar season (July to October) for the eleven years.

(3)

Table E.

Papanasam Hydro Electric Project—Reservoirs of different capacities.

M, C. FT.

Special issues for irrigation are stopped if storage drops below { 1,900 on August 1st. / 1,600 on September 1st. / 1,000 on October 1st.

Year.	Surplus in previous year.	Deficits for irrigation to be made up (not using steam plant).			Deficits which cannot be made up in any circumstances even using the steam plant.			Equivalent increase in size of reservoir by payment for steam plant.		
		5,500 million cubic feet No. 1.	6,500 million cubic feet No. 2.	7,500 million cubic feet No. 3.	5,500 million cubic feet No. 1.	6,500 million cubic feet No. 2.	7,500 million cubic feet No. 3.	5,500 million cubic feet No. 1.	6,500 million cubic feet No. 2.	7,500 million cubic feet No. 3.
1908	2,000	2,790	1,790	790		Nil.		2,790	1,790	790
1909	560	1,418	858	852	162	162	162	1,256	1.256	1,256
1910	Nil.	2,610	2,610	2,610	2,610	2,610	2,610		No good.	
1911		Nil.				Nil.			Nil.	
1912	..	790	790	790		Nil.		790	790	790
1913	2941	1,935	935	Nil.		Nil.		1,935	935	Nil.
1914	3,827	578	Nil.	Nil.		Nil.		578	Nil.	Nil.
1915			Nil.			Nil.			Nil.	
1916			Nil.			Nil.			Nil.	
1917	1,788	2,295	1,295	507		Nil.		2,295	1,295	507
1918	3,482	3,825	2,825	1,825		Nil.		3,825	2.825	1,825
1919			Nil.			Nil.			Nil.	
1920			Nil.			Nil.			Nil.	
1921	3,677	738	Nil.	Nil.		Nil.		738	Nil.	Nil.
1922 to 1926			Nil.			Nil.			Nil.	
1927	4,495	266	Nil.	Nil.		Nil.		266	Nil.	Nil.
1928	2,614	3,038	2,038	1,038	1,412	472	Nil.	1,566	566	Nil.
1929			Nil.			Nil.			Nil.	
1930	6,442	810	Nil.	Nil.		Nil.		810	Nil.	Nil.
1931 to 1933			Nil.			Nil.			Nil.	
1934	Over 4,000	2,385	1,385	385	1,467	467	Nil.	918	918	385
1935	Nil.	3,442	3,442	3,442	3,442	3 442	3,442		No good.	
Total for 28 years	..	26,290	17,962	12.239	9,153	7,153	6,214	17767	10,375	5,553
Average for 28 years	..	962	642	437	327	255	222	635	371	198
Average for the 14 deficit years only	..	1,923	1,283	874	654	511	444	1,269	741	397

Payments for steam plant—Issues from the reservoir to be paid for.

	1 Million cubic feet.	2 Million cubic feet.	3 Million cubic feet.
1908	2,224	1,224	224
1909	1,256	1,256	1,256
1918	2 969	1,969	969
1934	918	918	385
Total for 28 years ..	7,367	5,367	2,834
Yearly average ..	263	192	101
Advantage due to larger reservoir ..	..	(*a*) 71	(*b*) 49 + 71
Net quantity to be paid for ..	263	121	— 19
Cost at Rs. 130 per million cubic feet ..	Rs. 34,200	Rs. 15,730	Rs. 1,870
Extra cost of reservoir ..	N l.	14 lakhs.	30 lakhs
Interest at 4 per cent on extra cost ..	Nil.	56,000	1,20,000
Total ..	Rs. 34,200	Rs. 71,730	Rs. 1,18,130
Net extra payment over Col. 1 ..	..	Rs. 37,530	Rs. 83,930

In addition to reducing the average draw (which has subsequently to be made good by working the steam plant) from the reservoir the 6,500 million cubic feet reservoir allows 1,000 million cubic feet extra for the crops in 1928 and 1,000 million cubic feet extra in 1934; total 2.000 or average = 71. This can be assumed to reduce the average quantity paid for in comparing the benefits of the reservoir.

(*a*) 1,000 in 1928, 1,000 in 1934 — 28 | 2,000 — 71

(*b*) 472 in 1928, 467 in 1934, 442 in — 28 | 1,381 — 49

X

Reference from the Irrigation Development Board, No. 145/37-2, dated 10th February 1938.

Read—the following :—

Memorandum No. 2838-F/37-1, P.W.D., dated 8th October 1937.

From the Board of Revenue, No. H. 1886/37-2, dated 21st December 1937.

Reference—No. 145/37-2, dated 10th February 1938.

Submitted to the Government.

2. The report of the Chief Engineer for Electricity on the Papanasam hydro-electric project and the remarks of the Chief Engineer for Irrigation and the Board of Revenue were discussed at the meeting of the Irrigation Development Board held on 11th January 1938. The Irrigation Development Board considered that the reservoir as now

designed may be constructed. It agrees with the Chief Engineer for Irrigation that payment should be made by Irrigation to Electricity only for the actual cost of working the steam plant in years when the reservoir has been depleted in the interests of irrigation. It considers, however, that no attempt need be made to find these funds by transferring land from dry to wet or single-crop to double-crop. All that is necessary is to debit irrigation revenues with the amount actually spent in the working of the steam plant in the interests of irrigation.

F. R. Brislee,
Secretary.

To the Secretary to Government, Public Works Department.

Order—No. 785, P.W. (Irrigation), dated 20th April 1938.

Recorded.

(By order of His Excellency the Governor)

K. Ramunni Menon,
Secretary to Government.

GOVERNMENT OF MADRAS.

LOCAL AND MUNICIPAL DEPARTMENT.

392 M.

From

The Hon'ble Mr. C. G. TODHUNTER, I.C.S.,
Acting Secretary to the Government of Madras,
Local and Municipal Department,

To

The SECRETARY to the GOVERNMENT of INDIA,
Department of Education (Municipalities).

Dated Fort St. George, the 23rd February 1916.

Sir,

With reference to sub-rule (3) of rule 1 of the instructions regarding legislation in local Councils, I am directed to enclose a Bill for the amendment and consolidation of the law relating to the municipal affairs of the City of Madras and to place before the Government of India the main questions of principle which are embodied therein. The Bill is accompanied by a full Statement of Objects and Reasons with Notes on Clauses. I am, however, to say that all that is asked at this stage is administrative acceptance of the principles of the Bill. A separate application for leave to introduce it will be made later after all questions of principle have been settled.

2. The views of His Excellency the Governor of Madras in Council on that portion of the recommendations of the Royal Commission on Decentralization which affected Presidency municipalities were invited in Home Department letter 126, dated 17th July 1909, and were furnished in Mr. Davidson's letter 1681 M., dated the 12th October 1911. There followed further correspondence on the subject between the Government of India and the Secretary of State, ending with the Secretary of State's Despatch 83, Revenue, dated 11th July 1913, communicated to this Government with Mr. Porter's letter No. 190/200, dated the 1st November 1913, with reference to which the present Bill was drafted. The main features of the new Bill will now be indicated.

3. As recommended by the Decentralization Commission, the Bombay system of an elected President and a nominated Commissioner has been embodied in the Bill, which also retains the provisions contained in the Bombay Act for subjecting the Commissioner's proceedings to a substantial amount of scrutiny and, where necessary, of revision by the Council and its committees and sub-committees. Clause 24 is a new provision, requiring the other municipal authorities (namely, the Commissioner and the Standing Committee) to give effect to every resolution of the Council which is not cancelled by the Governor in Council; the power of the Governor in Council to cancel resolutions is limited to cases of illegality. It has also been provided in clause 23 (1) (another new clause) that, except as otherwise expressly provided in the Act, "the municipal Government of the city shall vest in the Council," thereby giving that body all residuary power, a provision to which the members of the Bombay Corporation attach special importance. On the other hand, in matters of administrative detail, the Bill gives the Commissioner larger executive powers than the President possesses under the existing Act.

4. In 1911, this Government proposed to attach a maximum salary of Rs. 2,000 to the office of Commissioner. His Excellency in Council, as at present advised, considers that this limitation might have the effect of depriving the Corporation prematurely of the services of a valuable officer.

5. The numerous matters of detail on which successful administration depends cannot be adequately dealt with by a large body meeting at somewhat distant intervals and consisting largely of men whose time is much occupied with their own private business. The Standing Committee's powers of control in respect of administration and finance have therefore been somewhat enlarged at the expense of those of the Council. At the same time, the constitution of this body has been made more representative. Under the present Act there are only four elected Commissioners on a Standing Committee of nine members. The Bill provides for a Standing Committee of thirteen members, of whom one will be the elected President and six others ward councillors.

6. As regards the Council itself, the Bill provides for the direct election of twenty-four councillors instead of twenty as at present. The number of councillors elected by institutions has been increased by two; the number of nominated councillors is retained at its present figure of nine. In this respect, the Bill differs from the Acts in force in Calcutta and Bombay, under which the number of councillors elected by wards is exactly half the total number. In Madras, this class of representatives will command a majority.

7. His Excellency in Council considers it necessary to retain the existing number of nominated members, in order to provide for the representation of communities which are in a permanent minority, and to secure the presence on the Council of experts, especially sanitary experts. The Madras Chamber of Commerce and the South Indian Chamber of Commerce (to the last of which bodies two representatives are now given) embrace practically the whole mercantile community; the Trades Association represents the larger shop-keepers, both Indian and European; the Madras Port Trust Board is a representative statutory body; the two railway companies also represent very important interests.

8. The election provisions in the existing Act are defective, and experience has shown the need for more detailed provisions in regard to electoral offences, the qualifications of voters and so forth. Chapter III of the Bill is entirely devoted to elections. The pecuniary qualifications for voters and candidates have been dealt with in clauses 52 (*b*) and (*c*) and 57 (*e*). The pecuniary qualifications laid down in the present Act have been found to be unduly high. In 1902, only 5,474 persons out of a population of 509,000 were registered on the electoral roll; in 1914, the number was a little over 11,000. The Bill removes this rigid pecuniary limit, the object being to make the lists of voters and candidates represent a larger section of the population. His Excellency in Council, as at present advised, proposes that in future the pecuniary qualifications of voters and candidates should approximate more closely or should, as in England, be the same.

9. The Bill attempts to provide a remedy, so far as the City of Madras is concerned, for "the smallness and inelasticity of local revenues and the difficulty of devising further forms of taxation" referred to in the Government of India resolution on local self-government of April last. The problem is particularly acute in Madras, an unhealthy city with a large area and comparatively much less trade than Bombay or Calcutta, which has *inter alia* to maintain at great expense a large network of roads.

10. Madras City, to complete schemes to which it is already pledged, must obtain another 155 lakhs in the form of loans or grants. The Corporation can raise rather less than 90 lakhs from loans with reference to the present statutory provisions (section 102), which limit the amount for annual service of loans to 10 per cent of the annual valuation of immovable property in the city. If the Corporation raised this sum of 90 lakhs in the course of the next ten years, it is calculated that at the end of that period there would, without new taxation, but allowing for the growth of revenue at the usual rate, be a deficit of about 5 lakhs on the revenue account, one reason being that the new water-supply and drainage system will cost 3 lakhs more to maintain than the present system.

11. The burden of the existing municipal taxation falls mainly on realty. The property taxes on buildings and lands, which comprise a general tax, a water and drainage tax and a lighting tax, yield 75 per cent of the revenue from taxation other than tolls. The profession tax, which may be regarded as a tax on personalty, is levied at very low rates on professional and mercantile incomes of not less than Rs. 1,200 per annum and yields only a lakh and three-quarters of rupees annually, or 8·5 per cent of the revenue from taxation. Consumption taxes (octroi on firewood and timber) produce 9·5 per cent, and miscellaneous taxes produce the remaining 7 per cent.

12. The maximum rate of the property taxes under the present enactments is fixed at 23 per cent of the gross annual value of the property in the case of hill municipalities, at 18½ per cent in the case of Madras City and at 16½ per cent in the case of the other municipalities in the Presidency. Having regard to the urgent need for largely increased revenues, if the City is to carry out in a reasonable time improvements which are of vital importance to its health and prosperity, the Government propose to raise the maximum for Madras City to 25 per cent against a 17 per cent rate in Bombay and a 19½ per cent rate in Calcutta. This rate must be multiplied by 10/9 for the purpose of comparison, since in Madras the assessment is on gross rental, whilst in Bombay and Calcutta a conventional deduction of 10 per cent is made. The Madras Government have considered the possible alternative of a single rate levied on houses, but are not in favour of it, on the ground that it discourages building, unduly enhances rents, especially in the case of the poor, and creates discontent in the large class of small house-owners.

13. This increase in the statutory maximum rate of the property taxes would enable the Corporation, if they chose, to increase their revenues by about six lakhs of rupees. It is, however, part of the policy of the Madras Government, as embodied in this Bill, to leave the Corporation, not only the power to vary rates of taxes, but also the power to choose between the different forms of taxation included therein.

14. The profession tax has been remodelled and now takes the form of an elastic cess on the Imperial income tax, which is levied on incomes, earned or unearned, of not less than Rs 1,000; the incidence of the present profession tax is now confined to earned incomes of not less than Rs. 1,200. Interest on securities does not come within the scope of either tax. The amount which would be derived from its inclusion is insignificant, and it would be raised almost entirely on Government paper and municipal securities, both of which classes of investments may well be left untaxed for local purposes. It is proposed that there should be a statutory limit of 100 per cent to the *centimes additionels*, and that the levy of the tax should be subject to the control of the Government of India, who will in any case be enabled to lower the maximum as they think best from time to time. Subject to the statutory maxima in the case of taxes on realty, and to the orders of the Government of India in the case of the personal tax, the Corporation would be free to shift the burden of taxation from realty to personalty or *vice versa* in accordance with local preference.

15. His Excellency in Council has given careful consideration to the views of the Government of India in regard to a profession tax, as set forth in the correspondence connected with Home Department letter 4, dated 14th January 1897, and paragraph 15 of the Resolution of your Department of the 28th April last, but he trusts that all apprehensions of possible encroachments on the sphere of Imperial taxation will be dispelled by the safeguards provided by clause 159 of the Bill. The Madras Government realize that the existence of the surtax cannot stand in the way of any modifications of the income tax which the Government of India may think fit to carry out in the future, whether in the way of enhancement or exemption, and that the Madras Corporation would have no claim to compensation on account of such changes. If, for instance, the field of exemption were extended to incomes above Rs. 1,000 a year, the Corporation would have to reimburse themselves by raising the rate of license fees or by other means and would have no claim to compensation from Imperial or Provincial revenues.

16. The property tax yields about 15 lakhs a year at present and the profession tax about 1¾ lakhs. The Imperial income tax levied in Madras City from all sources excluding interest on securities, amounts to about seven lakhs. A cess at 50 per cent would accordingly yield about 3½ lakhs of rupees per annum, or twice the amount produced by the profession tax.

17. Other new taxes which it is proposed to introduce are a duty on the unearned increment of immovable property (clauses 126—139) and a terminal tax on railway tickets (clause 160 and Part V of Schedule IV). Section 83 of the Calcutta Improvement Trust Act of 1911 supplies a precedent for the terminal tax. The unearned increment duty is a stamp duty on transfers and may be classed with the 2 per cent *ad valorem* stamp duty on transfers of immovable property levied by the Calcutta Improvement Trust under the same enactment. I am to explain in this connection that it is not proposed to set up in Madras another statutory body to do work which *prima facie* lies on the Corporation. On the contrary, the Town-planning Bill, which has been drawn up to supplement the present Bill, provides both for town extension and internal improvements, and designates the Corporation as the body which should undertake these duties. Calcutta and Bombay have found, however, that they require additional taxes to enable them to undertake large schemes of improvement; and though, owing to its comparatively larger area, Madras has not yet felt the need for relief of congestion so acutely, the large area in itself is a cause of much expense and in it there are some congested areas which must be opened up. In addition the Corporation has to finance the construction and maintenance of very large drainage and water-supply schemes and thus has even greater need for additional powers of taxation

18. The terminal tax is expected to yield about three-quarters of a lakh of rupees. The increment duty is a tax of 20 per cent on increments accruing at varying intervals of time, and it is not possible to estimate with any precision what the yield will be. Figures supplied by the Inspector-General of Registration suggest that since the beginning of the century there has been a rise of about 60 per cent in the sale value of immovable property. The value of the sales of such property totalled 60 lakhs of rupees in the year 1913. Assuming that, after deductions for improvements, etc., the average increment would be 30 per cent, the duty would yield $3\frac{3}{5}$ lakhs of rupees. Further particulars are given in the notes on clauses 126—139.

19. As already pointed out in paragraph 10 above, the borrowing powers of the Corporation under the existing Act are limited by the restriction in section 102 that the sum payable annually for the service of loans shall not exceed ten per cent on the annual value of buildings and lands. The drainage and water works schemes now in hand cannot be financed without exceeding this limit. In clause 169 of the Bill it is proposed to raise the limit to twelve and a half per cent, which can only be exceeded with the express permission of the Governor-General in Council.

20. I am to say that Part II, Schedule IV, which relates to the taxation rules under clause 163 of the Bill, is not sent herewith as His Excellency the Governor in Council wishes to consider whether it would be possible to simplify the rules contained therein.

21. It is possible that some of the changes embodied in the Bill may require the previous sanction of the Government of India under section 79 of the Government of India Act of 1915; or a validating Act may be necessary. As examples of this, I am to cite the provision that appeals against municipal assessments will be dealt with finally by the Court of Small Causes (Schedule IV, Part VI) and the proposed modifications of the Income-tax Act and Stamp Act in their application to the local income-tax and unearned increment duty, respectively. His Excellency in Council presumes that legal points of this nature will be dealt with by the Legislative Department, when leave is solicited for the introduction of the Bill.

22. The Bill for the Prevention of the Adulteration of Food and Drugs (which replaces Chapter XXXI of the Act of 1904) forwarded with Mr. Bedford's letter No. 698 M., dated 6th May 1915, and the Town-planning Bill, forwarded with his letter No. 180 M., dated 26th January 1916, form supplements to the Bill which is now under discussion.

I have the honour to be,

Sir,

Your most obedient servant,

C. G. TODHUNTER,
Acting Secretary to Government.

LOCAL AND MUNICIPAL DEPARTMENT.

NOTES CONNECTED WITH G.O. 392 M., DATED 23RD FEBRUARY 1916.

[SUBJECT.—*Madras City Municipal Bill.*]

Demi-official—from the Hon'ble Sir C. SANKARAN NAYAR, *Kt.*, C.I.E., Member of the Imperial Council.
To—the Hon'ble Sir SIVASWAMI AYYAR, K.C.S.I., C.I.E., Member of Council, Madras.
Dated—Delhi, the 20th November 1915.
No.—35 Muni.

In paragraph 4 of Mr. Bedford's letter 698 M., dated the 6th of May 1915, to this department, you say that the Bill to prevent the adulteration of food and drugs has been drafted with
A reference to certain changes to be introduced in the constitution of municipal authorities by the Madras City Municipal Bill. This latter is, I presume, the Bill with reference to which I was consulted in July last at Ootacamund. I think it would be very convenient for me to have
B the draft Municipal Bill along with the Adulteration Bill for consideration. I have no doubt you must have very nearly finished now the consideration of the City Municipal Bill. Will you kindly let me know when you are likely to send it up? As at present advised, I propose to take the matter up for consideration only after the draft Municipal Bill is received, unless you are going to delay the latter very long; in which case I may be obliged to take the Food and Drugs Bill up at present.

To the Secretary, Local and Municipal.

P. S. S[IVASWAMI AYYAR]—25-11-15.

Note on this, with draft.

J. P. BEDFORD—26-11-15.

Submitted that the presumption at **A** has been verified and found correct.

2. As regards **B** submitted that Mr. Galletti may be requested to be so good as to state when the City Municipal Bill is likely to be sent over to this Department for addressing the Government of India and in what stage it is at present. The draft demi-official will be completed with reference to the information furnished by the Special Officer.

T.B.R.—26-11-15.

N. CHENGAL RAO—26-11-15.

The Bill will probably be ready in fifteen days.

J. P. BEDFORD—26-11-15.

Thanks. I have replied to Sir Sankaran Nayar that I hope to be able to send up the Bill by the end of December or the first week of January.

P. S. S[IVASWAMI AYYAR]—1-12-15.

To the Special officer—

Could you kindly let me have a draft covering letter by the 10th instant if possible?

J.P.B.—2-12-15.

A draft covering letter is submitted. It has been written with special reference to the views expressed by the Hon'ble Sir C. Sankaran Nayar.

2. The Bill has gone to press. Proof copies of Part II, Part III, Chapter V, Schedule II and IV, as revised by the committee appointed under G.O. 923 M., dated 23rd June 1915, are however submitted; also of Part IV, Chapter X, the first clause in which is the work of the committee, and of Part III, Chapter VI (Finance), and the Statement of Objects and Reasons.

3. Copies of—

(1) Town planning Bill, revised edition,
(2) Statement of Objects and Reasons, revised,
(3) Decisions of Government

are also submitted in a linked file.

A. GALLETTI—8-12-15.

Please put up one or two specimens of letters forwarding Bills to the Government of India under the rule quoted.

J. P. BEDFORD—8-12-15.

Please see letters 760 M., dated 17th May 1915; 1089 M., dated 13th July 1909, and 1267 M., dated 16th July 1906.

N. CHENGAL RAO—9-12-15.

To the Honourable Member and circulate with draft letter to the Government of India. Mr. Galletti's draft was most useful and needed practically no additions. It was, however, very long: I have reduced it by cutting out argumentative matter and over-minute explanations.

The original draft letter included a reference to drafting committees. I have cut this out under the Honourable Member's orders obtained on a separate reference.

J.P.B.—13-12-15.

The sub-committee consisting of Mr. Davidson and Mr. Bedford assisted by Mr. Galletti have revised Parts II and III (constitution, taxation and finance) of the Bill and the related schedules (in so far as it was thought necessary to retain any schedules). They have also revised some important sections in the rest of the Act (e.g., portion relating to buildings, and power of local Government to make rules). The remaining portion of Part IV (public health), Part V (subsidiary legislation and penalities) and Part VI (miscellaneous) do not contain very much new matter. I asked Mr. Bedford what time he and Mr. Davidson would take to revise the rest of the Bill also it so required. He said that it would take another 75 sittings which means not less than six months especially as the cold season is one of great pressure of work.

I think it is really unnecessary to go through the labour of revising the rest of the Bill. It will indefinitely postpone the introduction of the Bill and opportunities will not be wanting to make such improvements as may be considered desirable when the Bill is referred to a select committee.

We are now applying to the Government of India only for administrative approval. We are not now asking for leave to introduce the Bill.

I would therefore suggest to my honourable colleagues that the Bill should now be allowed to go forward with the covering letter drafted by Mr. Galletti and approved by the Secretary.

P. S. S[IVASWAMI AYYAR]—15-12-15.

So far as I can find, there is no copy of the complete Bill, or of the notes on clauses, in the file, and it is difficult to remember what the portions of the Bill which have not been revised by the committee were like. It would also be convenient to be able to compare the portions of the Bill as revised by the Select Committee with the original prepared by Mr. Galletti. I am afraid I must ask for a complete copy of the Bill.

A. G. C[ARDEW]—18-12-15.

The Hon'ble Mr. Cardew has asked for a complete copy of the Bill (as revised). Please let me have it as soon as possible.

J.P.B.—20-12-15.

To the Special officer—

I submit a complete copy of the Bill with—

(1) Statement of Objects and Reasons.
(2) Notes on clauses.
(3) Series of proceedings of committee and sub-committee;
(4) Conspectus of sections and clauses.

The distinctive printing in the Bill shows its variations from the existing Act.

A. GALLETTI—23-12-15.

To the Local and Municipal Department.

LOCAL AND MUNICIPAL DEPARTMENT.

To Honourable Member and circulate.

I have not checked the Statement of Objects and Reasons. If desired, I will do so. It looks to me as if it would be rather the better for some pruning.

J. P. BEDFORD—23-12-15.

P. S. S[IVASWAMI AYYAR]—24-12-15.

There is, I presume, some good reason why the copy of the original Bill which I asked for in my note of the 18th has not been put up. Unfortunately I did not preserve the copy I worked on at Ootacamund.

2. I do not wish to delay matters by pressing that the whole Bill shall be submitted for revision to the committee appointed in G.O. 923 M., dated 23rd June 1915, but perusal of those clauses in the Bill which are new suggests that many of them will require revision in Select Committee. As instances the following may be referred to:—

Clause 190 (3).—The insertion of this provision relating to water-supply for burning-grounds in a section relating to a supply of *drinking* water seems inappropriate.

Clause 195.—It does not seem to me clear whether the supply of water to the Port Trust, which is made compulsory on the Corporation, is to be free of cost or not. Moreover the corporation should be bound to supply the Port Trust only for public needs of the Trust and not without limit. Again the words "Local Government" should have been corrected into "Governor in Council," in conformity with changes made elsewhere.

Clause 196.—The drafting of this clause is, I suggest, obscure. The term "Fort St. George" is not defined and it is not evident what it may mean here; does it include the Fort ditch? The reference to "public cemeteries, gardens or institutions administered by the *Governor General in Council*" has, I suppose, some point; but it is, I think, objectionable to give the Government of India power to interfere with the local corporation, while the right of appeal to the Secretary of State is a rather extraordinary provision.

Clause 197.—Are not the words "at their discretion" surplusage? Indeed the whole clause seems unnecessary.

Clause 236.—It is not shown why the Council is to "have a voice in the matter" under sub-clause (*b*). At present the Standing Committee can deal with it, for under the General Clauses Act, the Standing Committee can exercise its powers under section 233 "from time to time". The words "receiving the authority of the Council" seem hardly happy as the Standing Committee is itself an authority (chapter II.)

Clause 388 (4) "*of* the Commissioners" is a double genitive.

3. I have not, of course, examined all the clauses of the Bill, but have noted only a few matters that chanced to attract attention in perusal.

4. I should be inclined generally to enlarge further the powers of the Commissioner. What should be aimed at is, I venture to think, a strong executive which will be responsible for misuse of its powers but which should not be tied up by the need of references on points of detail to the Standing Committee or Council *before* it can act. Thus, under clause 189, is the consent of the Council and the sanction of the Governor in Council really necessary? Limitations as to power to make contracts are imposed in chapter IV. In clause 198, is proviso (1) needed? If the Commissioner is fit for his post, he should be trusted to deal with these matters without previous sanction of the Standing Committee. Compare the wide powers as to drains in clause 205 *et seq.* In clause 303 (3) it is not clear why the Standing Committee need be invoked unless the owner appeals. In clause 406 and clause 418, sub-clauses (*f*), (*g*), (*h*) and (*j*), I should be disposed to enlarge the Commissioner's powers. He can be called to account if he misuses them. Generally, I should prefer to give the Commissioner the power of initiating action subject to appeal to or control by the Standing Committee or Council rather than require him to act only after getting their sanction. This is a matter which should be settled before the Bill goes on to the Government of India as we shall find it hard to alter it in this respect later.

5. I agree with Mr. Bedford as to the Statement of Objects and Reasons.

A. G. C[ARDEW]—30-12-15.

I would gladly have passed these drafts at once but the matter is very important and even now I have by no means, owing to pressure of business, been able to make an adequate examination of the Bill.

2. I have no doubt that the Hon'ble Mr. Cardew is right in his preference for a commissioner with wide powers, and a competent dictator would give us a more efficient city Government than any Council. But we have passed the days of dictators and since some form of corporate Government is necessary, we must give the corporate body powers and responsibilities or we shall get no one who is worth his salt to join the council. I do not think that in any case the commissioner should have power to construct water-works (clause 189) without the previous consent of the council and the sanction of the Governor in Council, nor do I think that the restrictions on the commissioner's power of making contracts are excessive. On the other hand, proviso (i) in clause 198 seems to me a wholly unnecessary interference with the commissioner's executive powers and I agree with Mr. Cardew as to clause 303. As to clauses 406 and 418, I think there is room for doubt. I suggest, however, that these are details which we can examine while the Bill is with the Government of India, for they would make no objection to our amendment of such comparatively unimportant provisions and meanwhile we shall be getting their sanction to the principles of the Bill.

3 I have paid more attention to the financial than to the administrative portions of the measure and I have a few observations to offer:

Clause 126.—My recollection is that we settled that the increment duty should not be levied as a stamp duty as there might be difficulty in the corporation obtaining its share of the total stamp duty if the tax were collected in this way—see also clause 135 which carries out our decisions. Moreover, I would not confine the incidence of the duty to cases of conveyance on a sale, for that would exclude, so far as I can make out, all cases of transfer under the Land Acquisition Act. Further, parties might agree to transfer without any instrument of sale and in that case also they would escape liability for this duty.

Clauses 136 *to* 139 strike me as rather clumsy and not likely to be accepted by the Government of India.

4. Turning now to part II of schedule IV, I must enter a protest against the present value of a perpetual annuity being calculated at sixteen and two-thirds years' purchase and against that being taken as the maximum value of an annuity for a definable term. I think the whole of part II of the schedule requires heavy pruning. I have not time to do it myself but if a fresh mind were brought to bear on it, I am sure that the luxuriant product of Mr. Galletti's imagination could be largely reduced in quantity.

5. In the draft letter, I must ask for the omission of the passage in paragraph 7 which I have enclosed in red chalk brackets I do not think it is correct to say that the Madras Government have viewed and continue to view special electorates with disfavour. I believe that we recognize that in the circumstances of this country they are necessary in some cases and in this very Bill we have retained the special electorates and I think added to them. This is, indeed, noticed immediately after the passage to which I object, and it makes the paragraph very curious reading.

6. In paragraph 9, I would not say that Madras was a city with comparatively little trade. It has a very fair volume of trade though nothing like so much as Calcutta or Bombay.

7. I would omit the last sentence in paragraph 12 which has little relevance and such as it possesses is in the direction of furnishing an argument against the contention in this paragraph, for the single indefinite rate is still retained in England.

8. I notice that there is no reference in the letter to the new provisions in clause 169 empowering the Governor-General in Council to sanction an extension of the corporation's borrowing powers. This was inserted at my suggestion to enable the corporation to raise special loans for special purposes such as the purchase of the tramway system or the electric supply undertaking.

9. I have noticed a number of minor matters in going through the papers but they have no bearing on the general principles and are not of first-rate importance: I therefore refrain from mentioning them in this note.

H. A. S[TUART]—24-1-16.

Under personal instructions of His Excellency the Governor I submit the following note on the question of consultation with the corporation on the Bill or on the principles embodied in the same.

2. The Bill owes its origin to the Royal Commission on Decentralization. In memorandum 2821-1 M., dated 8th June 1910, printed at page 2 of G.O. 1680 M., dated 12th October 1911, the corporation were asked to report on the recommendations of the commission with reference to their constitution and they forwarded the report of a sub-committee on the same expressing their opinion in so doing that it was highly desirable to draft a consolidating and amending Municipal Act in place of the existing Municipal Act, which they considered to be highly defective. In G.O. 1680 M., dated 12th October 1911, they were asked to schedule the defects they referred to. In G.O. 600 M., dated 23rd March 1914, they were given a list of 34 heads under which the Government of India had approved of amendment of the Act and were again asked for the schedule of defects which they had observed in it. A schedule drawn up by the President and the heads of departments was forwarded in April 1914 and individual commissioners were invited by Mr. Galletti to make their criticisms direct to him. A resolution proposing a committee for the purpose of scheduling the suggestions of the corporation as a whole was however postponed sine die as the corporation considered that the proper time to consider the matter would be when the Bill was drafted and published for criticism (G.O. 863 M., dated 29th April 1914). In September 1915 notice was given of a resolution to the effect that before the Government of India gave its sanction for the introduction of the proposed measure in the Madras Legislative Council, the Madras Government be requested to forward the proposed measure for consideration by the corporation. This resolution gave rise to adverse discussion, in which the distinction between obtaining the approval of the Government of India in the administrative department and obtaining permission to introduce the Bill seems to have been lost sight of. The proposition was carried unanimously and recorded in G.O. 1839 M., dated 20th November 1915.

3. The ways in which consultation with the corporation is now possible seem to be as follows:—

(1) to consult them on general principles as has been done in the case of District Municipalities and Local Boards;

(2) to ask the Government of India before they themselves examine the Bill in detail to let this Government consult the corporation upon it;

(3) to let it go in the ordinary course to the executive department of the Government of India and, on receipt of their criticisms, to re-draft it, if necessary, and then consult the corporation; and

(4) to obtain, in addition to the approval of the executive department, the permission of the Legislative Department to introduce the Bill, and then publish it, and consult the corporation at the same time.

4. As regards the first of these courses, it is submitted that the corporation have already been duly consulted on the general principles and have declined to advise without the Bill. It will be useless therefore to consult them *in general terms* now.

5. The second course is one for which there is no precedent and does not seem likely to save much time. It would probably take the Government of India as long a time to say whether there was any objection to the discussion of the principles of the Bill with the corporation as to say whether they accepted those principles.

6. The third course is that which was followed in connection with the Bill which now forms the present Act (vide G.O. 42, Legislative, dated 29th July 1903, and letter to the Government of India, 44, Legislative, dated 5th August 1903). This would give the corporation more than they have asked for. In the first instance they were prepared to wait until the Bill was published for criticism. Even the resolution on which there was so much discussion only asked that the corporation might be consulted before the Government of India gave their consent to the introduction of the Bill in the Legislative Council.

7. The fourth course, as noted above, is what the corporation asked for in the first instance.

8. In the circumstances it seems that the best course to pursue is to proceed with the examination of the Bill now and forward it to the administrative department of the Government of India and when doing so to advise them that the Government propose to consult the corporation on the Bill as a whole before applying for leave to introduce it.

9. It will be seen from Sir William Meyer's demi-official at page 10 of the papers connected with the file of decisions of the collective Government in connection with the Bill that the proposed surcharge on income-tax, if approved by the Government of India, will probably need the sanction of the Secretary of State.

A

C. G. TODHUNTER—12-2-16.

One element in this case is that the Bill and the connected papers are undoubtedly still in a somewhat crude condition. Otherwise, I should be more clear than at present that the Bill should go now to India for administrative sanction.

If it does go now, we might at the same time intimate our intention to consult the corporation further in regard to the Bill when it returns, and ask that, if there are any objections to our doing so in respect of any portions of the Bill, this may be intimated to us.

Please circulate: so that Honourable Members may if possible see this before Thursday.

P[ENTLAND]—14-2-16.

There is not time to call for references, but my recollection of what was done in the case of the Irrigation Bill is that it was prepared in the Secretariat by an officer on special duty and was then considered and revised by the Government, just as has been done with the present Corporation Bill. It was then forwarded to the Government of India who returned it, after months of delay, and told us to publish it for general information and criticism. If this precedent is any guide, the course we should now take is to refer the Bill at once to the corporation for its remarks, and lay it on the Editors' Table with a Government Order stating clearly that it is a provisional draft. This course leaves us free to modify any provisions of the Bill in the light of public criticism; it does not commit the Government of India to anything because the financial provisions of the Bill have not been formally before them; and it gives public opinion and the corporation a full opportunity of being heard before we address the Government of India, with our considered proposals. It is not one of

the four courses which Mr. Todhunter proposes but why he does not consider it a possible way is not stated. I do not see what advantage is gained by sending the Bill to the Government of India first, if we are going to consult the corporation afterwards.

A. G. C[ARDEW]—15-2-16.

The Bill contains financial provisions of an important and novel character and we do not know whether the Government of India will sanction them. It seems to me that ordinary official usage requires that we should obtain that sanction before making public any proposal by us to insert such provisions, for otherwise we might embarrass the Government of India by submitting to it proposals which it felt bound to reject though they had been publicly announced by us and accepted by the corporation. On the other hand the Government of India and the Secretary of State will in no way be embarrassed by our subsequent withdrawal of these provisions if we find that course necessary. I prefer therefore the third of Mr. Todhunter's four courses to the procedure proposed by the Hon'ble Mr. Cardew.

H. A. S[TUART]—15-2-16.

I am of the same mind as the Hon'ble Sir Harold Stuart.

P. S. S[IVASWAMI AYYAR]—16-2-16.

Order in Council.

Agreed that the Bill be submitted to the Government of India for administrative sanction without the schedule relating to increment duty.

P[ENTLAND]—17-2-16.

The notes are submitted to the Honourable Member by special messenger as desired in his telephone message.

C. G. TODHUNTER—21-2-16.

I have made a few alterations and additions to meet the Hon'ble Sir Harold Stuart's suggestions. The taxation rules schedule should not be sent. Please expedite the despatch of the Bill.

P. S. S[IVASWAMI AYYAR]—22-2-16.

Further Note.

I submit an abridged copy of the statement of objects and reasons for approval with reference to the Hon'ble Mr. Cardew's note at page 4.

I also submit a proof of the draft letter in which I have sidelined in pencil some minor alterations that seemed necessary.

Paragraph 1.—It is made clear that a separate application for leave to introduce is to follow.

Paragraph 3.—A sentence is omitted with reference to the curtailment of the statement of objects and reasons.

Paragraph 17.—A slight alteration is made to avoid conflict with a former letter, in which we said we had no congestion, but needed money just as much because of our area.

Paragraph 22.—The Town-planning Bill has since gone to India.

C.G.T.—26-2-16.

Drafts approved.

P. S. S[IVASWAMI AYYAR]—27-2-16.

Issue at once.

C.G.T.—28-2-16.

[G.O. 392 M., dated 23rd February 1916.]