Cn-1854

Public Works (1896) Department.

G.O., No. 3378.W

DATED 24th November 1896.

25/11/96

[Despatch Abstract.]

Floods in the Kistna River

Orders of the Revenue Dept: on Proc: of the Board of Revenue submitting report from the Collector of Kistna on the recent —, Commd: to officers concerned with remark.

100/4

I.C.C. 24/11

[P.W. 25. 1,000—23-10-96.]

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G.O., No. 3378 W., 24th November 1896.

NOVEMBER.

Floods in the Kistna River

Orders of the Revenue Department on Proceedings of the Board of Revenue submitting report from the Collector of Kistna on the recent —, communicated to officers concerned, with remark.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Buildings and Roads.
Civil Works.

READ—the following paper:—

G.O., Mis. No. 4395, Revenue, dated 7th November 1896.

Read—the following Proceedings of the Board of Revenue (Revenue Settlement, Land Records and Agriculture), dated 5th October 1896, No. 259:—

Read—the following letter from J. N. ATKINSON, Esq., Collector of Kistna, to the Secretary to the Commissioner of Revenue Settlement and Director of the Department of Land Records and Agriculture, dated Masulipatam, 12th September 1896, Dis. No. 3940-Ver.:—

I have the honour to report on the recent floods in the Kistna river. I had been in hopes of being able to send complete information as to loss of property, public and private, and for that purpose have delayed the report; but it is impossible to procure complete lists of such items as cattle lost and fallen houses; while it is altogether premature to refer to loss of crop, since the ryots are striving vigorously to repair their losses, and will probably replant almost the whole area that was destroyed.

2. I append a statement showing the readings of the river-level at the gauge above the anicut on the Bezwada side; and in examining these readings, it may be borne in mind that in the present floods, the water has been at a uniform level both at the Bezwada and the Sitanagaram head-sluices, whereas in the floods of 1882, the previous highest recorded, the greatest height attained at Bezwada was 40·05 feet and at Sitanagaram 40·70 feet.

3. The rise commenced on July 27th, and from that day steadily continued till the maximum flood-level of 41·30 was reached on the evening of 6th August, for three whole days the river standing at a higher level than the maximum in 1882. It happened that during the earlier stages of the flood, almost all District officials were absent from Bezwada; the Superintending Engineer and Executive Engineer, Kistna Eastern Division, being on tour in different parts of the Gudiváda taluk; the Executive Engineer, Northern Division, having proceeded to the Upland taluks, whilst I myself had gone to Chinna Ganjám on the south-west confines of the district. Only the Head Assistant Collector, Mr. Cumming, who had been a bare week in the district, remained at Bezwada. Information that a flood of unusual height was expected was, however, soon communicated, and all hurried back to the scene of action.

4. The following is approximately a complete list of breaches in the river flood-bank, with the dates on which they occurred:—

Western Delta.

1.	Ravi Anantavaram, hamlet of Penumudi ...	31st July, at night.
2. 3.	Kollur (two breaches)	1st August.
4. 5.	Pedapulivarru (one breach)	
6. 7.	Pallepalem (two breaches)	
8. 9. 10.	Turpupalem (one breach)	
11.	Penumudi (three breaches)	
12. 13. 14.	Kaytepalli (one breach)	
	Pedapulivarru (three breaches)	5th ,,

Eastern Delta.

1. 2. 3. 4. 5. 6.	Kottapalem and Kokkiligada breaches, six in all	1st August.
7.	Avanigadda	1st ,,
8.	Pulipaka	2nd ,,
9.	Puligedda	2nd ,,

Northern Division.

1.	Ibrampatnam	6th August.

Complete information has not been received from the Divi Island (Avanigadda Division), and it is probable that other breaches occurred below Avanigadda village; but as that part of the country is sparsely inhabited, any damage that may have been caused would by comparison be insignificant. The highest breach on the western side was at Kollur about 25 miles below the anicut; and on the eastern side, omitting the Ibrampatnam breach, at Pulipaka only about 7 miles below the anicut. It was these two that caused the greatest danger and devastation, sending a huge volume of water over the greater portion of the Répalle and Bandar taluks, respectively, so that spreading out fanwise, the flood eventually covered about 1,000 square miles of country, widening the actual mouth of the Kistna to something like 50 miles from Masulipatam to Perali in the Bápatla taluk.

5. I cannot enumerate the various breaches to canals, nor will I attempt to write the history of the struggle to save the head-works at Bezwada and Sitanagaram. We, laymen, were told by the Engineers that for some time the head-works were in great danger; and what we saw was the platforms of the head-sluices covered by some inches of water, so that a rise of less than a foot would have brought the water over the top of everything into the canals; we could feel the masonry quivering to the enormous pressure of water; and we saw, as the water fell, how alarming had been the erosion of revetments and the subsidence of solid masonry walls. What would have happened had the water breached the head-works, no man can divine; but that there must have been appalling loss of life and property seems certain, and it is not impossible that the present system of irrigation would have had to be almost re-constructed. A deep debt of gratitude is due to the Engineers, especially the Superintending Engineer and the Executive Engineer, Kistna Northern Division, whose watchfulness and forethought never flagged for a moment. For several nights all officers of the Public Works Department were without sleep. Every thing was done that could be done, and it may be well surmised that but for the precautions taken, the works would have been unable to withstand the enormous strain that was thrown upon them.

6. The Commissioner of Revenue Settlement had come to Bezwada on 2nd August, and to him I am indebted for having organised the first arrangements for rescue of life and property. Before this on the 1st, Mr. Cumming had proceeded in company with Mr. Keeling, taking the Public Works Department steam-launch and some boats, to bring off the inhabitants of the villages on the right bank above the anicut, where the flood-water speedily submerged a tract measuring 90 square miles. On the morning of 2nd August, Mr. Cumming had to hurry back to his own division which was being inundated through the Pulipaka breach. The work of rescue from the submerged villages above the anicut was continued day by day by the Executive Engineer, Kistna Northern Division, and the Sub-Collector till the 8th by which time about 2,000 persons and many cattle had been placed in safety.

7. Mr. Cumming had proceeded on the 2nd, as just stated, to the neighbourhood of the Pulipaka breach, where he commenced an active crusade in such boats as he could pick up, to bring off people and property from villages in danger. In all about 425 persons were brought off.

8. On the 4th, the Commissioner directed Messrs. Kearns (Assistant Commissioner, Salt and Abkári) and Haden (Inspector, Salt and Abkári) to work through the low-lying country between Kankipad and Tsallapalle. These officers had a most laborious task and did it to perfection. For a considerable part of the distance, boats either

could not be procured, or could not be taken in the desired direction: and it was necessary that most of the work should be done on foot, for hours and hours at a time, in mud and water reaching from the knee to the chest, with scanty meals snatched at irregular intervals; and once without any food for a whole day. I have learnt that part of the work was done in uniform, and the wear and tear of clothing and shoe-leather was very serious.

9. On the 5th, the Commissioner wired to the Superintendent of Police to proceed to the tract of country between Tsallapalle and the sea. On the same day, the Head-quarter Deputy Collector arrived in Masulipatam from a tour in Gudiváda; and these two officers, after encountering the most vexatious opposition and obstruction from boatmen and others, started on the morning of 6th to visit all the low-lying tract between Masulipatam and the river-bank near Tsallapalle. As it turned out, this was the place where danger and distress were greatest, and the relief operations had to be continued till the 21st. Mr. Hasted's experiences were only little less trying than those of Messrs. Kearns and Haden. Once he was twenty-eight hours without food or drink. For days together he had not a rag of dry clothing. Messrs. Kearns and Haden joined Mr. Hasted at Challapalli on the 11th and thence forward, the partly of four, including the Head-quarter Deputy Collector, worked in concert throughout a tract having its centre at Tsallapalle, with a diameter of about 20 miles. The number of people rescued from danger of drowning by the Superintendent of Police was about 350. I am glad to add that long before the arrival of Superintendent of Police or Divisional Officer, and without any instructions from any one, the Tahsildar of Bandar, K. Muktesvara Row, had, from the first appearance of danger, been working most energetically and indefatigably in preventing loss and damage and in succouring the distressed. By his sole exertions he preserved some miles of flood-bank from being overtopped and breached; and he succeeded even in closing several small breaches before the rush of water exceeded control.

10. I was myself at Chinna Ganjám, when late on the night of 2nd August, I got the first news of the expected flood. I started back the next day and reached the right river-embankment about 12 miles above Kollur at daybreak on the 5th. The Executive Engineer, Kistna Western Division, and the Sub-Division Officer were both at Kollur, and just before my arrival there, the Public Works Department Overseer arrived from a visit of inspection to villages lower down. Nothing could possibly be done to existing breaches. The duty at hand was to put people and their belongings in safety, and to take all possible steps to prevent further breaches. I spent the 5th and 6th in seeing that the large Mala and Madiga population of Kollur were rescued from a very perilous position, and in making the flood-bank as safe as practicable for 10 or 12 miles above Kollur. On 7th August, I proceeded to Sitanagaram, crossing to Bezwada the next morning.

11. On the 7th, the Commissioner of Revenue Settlement had accepted an offer from the Revd. Mr. Harrison and Revd. Mr. Peachey of Bezwada, to proceed on a relief expedition in the track of Messrs. Kearns and Haden. Like all others similarly employed, these gentlemen underwent much exposure and privation, and were instrumental in relieving some 330 persons who had no food. The Revd. Messrs. Goodman and Wathen of Masulipatam, also volunteered to carry help to those in the Budameru valley; but before they could reach the spot, all danger was over.

12. On the 6th, the Commissioner had wired to the Assistant Superintendent of Police saying that nothing could be heard of me, that I was probably cut off somewhere in Répalle taluk, and advising him to go to my relief. Mr. Dene did not go. On the 8th, I wired to Mr. Dene to proceed to Kollur and work through the worst parts of Répalle. He did not go, but sent me a letter on 9th asking for further instructions, and stating that he proposed to come to Sitanagaram on 10th to get a house-boat in which to travel. I sent him urgent orders the same day (9th) to start at once by road for Tenali. As it was raining, however, he found it impossible to start till the next day. I am glad to say that this was the only case that came to my notice in which orders issued were not at once obeyed.

13. I was very anxious about the state of the Divi Island from which I could get no information, and had wired to the Port Officer, Masulipatam, on the afternoon of 7th to send boats thither. The same night at 11 o'clock five large dhonies were

despatched to traverse the island in all directions. These boats rescued 117 persons, most of whom were found sitting on their house tops; and gave food to many more who declined to leave their homes. I was still much concerned for the villages along the long line of inundated seaboard, and on 8th, wired to the District Forest Officer in Masulipatam to visit them. He misunderstood the first message; but a second on the morning of 9th set matters right, and at noon on that day, he and the Assistant Conservator, Mr. Fischer, and the Forest Surveyor, Mr. Le Tang, started off in separate boats and separate directions, arranging at the same time to keep touch of one another. It was well they went; they found villages probably in worse plight than any hitherto visited; in one case the whole population had been 5 days without food, one boy having in consequence lost his reason; in another there was not an inch of dry land anywhere, and four poor women had been prematurely confined as they lay in six inches of water.

14. The day after my return to Sitanagaram, *i.e.*, on 8th August, I had despatched the Sub-Collector, still dependant on his crutches, to visit the worst parts of Répalle taluk; having already left the Tahsildar, an energetic and reliable officer, busy in the same good work.

15. The preceding paragraphs give the briefest outline of how the work of rescue and succour was organised, and being carried out. Every tract where danger was believed to exist was visited, and the worse parts not once or twice but constantly. The area on the east of the river was roughly about 600 square miles, and that on the west about 400 square miles in extent; but apart from this the intensity of the distress was much greater in the former. In the Répalle taluk I found, during the height of the floods, that all those who were washed out of their homes had saved ample stores of food; indeed so far as my inquiries went, no grain at all was lost on that side. The Sub-Collector, who continued my inquiries and who visited the worst parts of the taluk, as well as the Tahsildar and other local officers, reported that no relief was needed except materials to re-build fallen houses. In the way of food therefore, no relief was given in the Répalle taluk, except a meal apiece to 279 persons whom Mr. Dene found to be temporarily destitute.

16. In the Bezwada, Nuzvid and Bandar taluks, matters were very different. The people apparently had not foreseen what was coming; and their stores of grain were in many of the villages entirely destroyed. Those who thus suffered were almost all of the lowest and poorest classes—Malas, Madigas and poor Muhammadans; and it may be mentioned, as further explaining the difference between the two sides of the river, that there is a much larger proportion of poor Panchamas on the east than on the west of the river, at any rate in the Delta. Of those who were flooded out in the Guntúr taluk above the anicut, 711 were fed on different dates, these having been caught by the flood unawares.

17. The breach in the left or east flood-bank above Bezwada occurred on the morning of 6th August. It seemed to possess capabilities for mischief even greater than any of those in the Delta. Fortunately the land falls from the very site of the breach naturally and rapidly in and alongside an old drainage channel to the Budameru river, and the water that poured through the breach followed this course, leaving the adjacent villages unaffected, but submerging and breaching the Nizam's Guaranteed State Railway in its progress to the Budameru channel, which luckily was dry. The water followed the Budameru to the Colair lake, and though it threatened at one time to breach the East Coast Railway, and did actually submerge three or four villages in Gudivada taluk, and breach many of the Government channels, the damage done was comparatively insignificant and certainly much less than was expected.

18. Considering all the circumstances, the loss of human life so far as reported has been extraordinarily small. I have inquired in all directions from private as well as official sources, but I can find no reason to suppose that reports of deaths have been suppressed. Every endeavour was made to systematise the work of rescue, but exact instructions are impossible, and would probably be risky in such abnormal circumstances. To a very large extent officers must be left to rely on their own judgment and initiative; and when it is remembered how many there were that came within measurable distance of not being succoured in time, the 50 persons whom Mr. Lushington relieved from a 5 days' fast; the many hundreds that were brought off

in scores of different villages when the water was on the point of submerging everything; the unfortunates whom Mr. Hasted released from the tops of palmyra trees, their only coign of safety, by means of the Chellapalli elephants; the two men whom Deputy Collector Muhammad Aziz-ud-din Hussain Saheb found long after night-fall up to their necks in water crying for help; when these and the innumerable other narrow escapes are remembered, one can regard it as nothing less than marvellous that the death-roll is so small. In all, seven deaths have been reported, but it is at least uncertain whether two of them were due to the floods. Two children were drowned at Pedda Yadara, Bandar taluk; and two men at Pedaprolu in the same taluk while trying to cross a deep and rapid channel were swept away. One old man was crushed by the fall of a house at Pesarlanka in Répalle taluk. Besides these the body of a man was found stuck in some bushes within 5 miles of Masulipatam town; and another male body very much decomposed was found by the Répalle Tahsildar caught in a babúl tree not far from Kollur. But these two last may be bodies of those who had died from natural causes. Mr. Harrison saw a dead body in a tree, but whether of a human being or an animal he could not say.

19. The death-roll of cattle is not yet made up, nor do I suppose that exact figures will ever be procurable. Detailed reports will, however, be obtained from every village as early as possible. I anticipate that, as in the case of human beings, the numbers will be found surprisingly small. Thus in the 90 square miles of submerged country above the anicut in the Guntúr taluk, from which the statistics are almost complete, it is reported that only 66 beasts have been drowned, and that though these villagers were taken by surprise and cut off by a broad sheet of deep water almost before they knew the flood was approaching. Some animals were seen as they were swept over the anicut. For these there was little hope; but one particularly fine bull struggled ashore, and with difficulty clambering up the steep railway bank, stood to rest himself on top; the next moment an engine rushed along, and the scarce-rescued animal was its victim.

20. Both men and cattle, however, ran a risk of starvation almost as great as that of drowning. As noticed above, all supplies of food-grain had been completely destroyed in scores of villages, and the poorer classes, livers from hand to mouth, unable to obtain employment while the water covered the ground, had only State aid and private charity between them and death. Private charity here and there did much. The Zemindar of Chellapalli fed many hundreds of destitute persons in his estate so long as the floods continued; the late Huzur Sheristadar, M.R.Ry. K. Narayanaswami Naidu, gave food for some days to a large number of refugees from villages near the seaboard; in many of the inundated villages the wealthier classes, whose houses were on a safe elevation above the floods, distributed food to their less fortunate neighbours. But there was no organization of private charity, even the many local branches of the District Association having failed to seize this opportunity for tangible public beneficence. It therefore fell to the State to relieve the great destitution in which so many hundreds were plunged.

21. The distribution of State relief commenced on 2nd August to certain of those who had been brought from the tracts above the anicut, and continued till 28th August. The numbers fed on each day, so far as ascertained, were as follows:—

August,	2nd	...	...	...	142	August,	14th	...
"	3rd	...	...	...	86	"	15th	...
"	4th	...	...	...	46	"	16th	...
"	5th	...	...	...	229	"	17th	...
"	6th	...	...	...	444	"	18th	...
"	7th	...	...	...	703	"	19th	...
"	8th	...	...	...	405	"	20th	...
"	9th	...	...	...	782	"	27th	...
"	10th	...	...	...	1,008	"	28th	...
"	11th	...	...	...	1,369			...
"	12th	...	...	...	918			Total
"	13th	...	...	...	1,052			

August,	14th	...	2,204
"	15th	...	900
"	16th	...	850
"	17th	...	400
"	18th	...	140
"	19th	...	137
"	20th	...	137
"	27th	...	6
"	28th	...	13
		Total ...	11,971

In addition to the above, Mr. Lushington's relief party fed 2,419 persons in the five days, 10th to 14th August inclusive (the details for each day not having been furnished), making a grand total of 14,390 persons relieved from want of food. A word of explanation is necessary as to the 19 persons relieved on 27th and 28th

August. The river had begun to rise again on 16th and continued rising till 23rd. On the evening of 23rd August, I got a report from a Forest Range Officer, who had just come from Divi Island, that many of the villagers were again totally submerged, and that the poorer classes were in a dangerous state of destitution. I at once despatched Deputy Collector T. V. Narayanasawmi Iyer, who, however, found that the water had already begun to subside and that only 19 persons required relief.

22. The case of the cattle was even more pitiable, if possible, than that of the human beings. Over an enormous extent of country the grass was submerged for upwards of a fortnight. Straw ricks were either submerged, swept away, or spoilt. Many animals made their way by instinct through great stretches of water, wading and swimming, to knolls and ridges of high ground which they soon stripped bare of all verdure. Some were fed by straw imported by boat across the floods; very many others were driven, so soon as opportunity served, to the Upland taluks; and some were kept alive with thatch, palmyra leaves and any fodder procurable. All river-side and coast Forest Reserves were thrown open to free grazing, but most of these were of course under water. The total mortality among cattle is not known yet.

23. The loss of public and private property has of course been very heavy. The repairs to irrigation works and to the river conservancy works will cost many lakhs of rupees. I cannot give details of damages which will doubtless be reported by the Superintending Engineer, but a few instances will illustrate the extent of the disasters. The Bezwada-Masulipatam canal for a distance of about eight miles has been riddled. At one point, six furlongs of the left bank in a continuous line have been washed away. Passing by many minor breaches, there were, in these 8 miles, three enormous gaps from side to side of the canal 300 or 400 feet broad, where the scour-holes on either side were 10 to 15 feet below bed-level of the canal. In the Iskapalle channel, which runs roughly parallel to the coast line, for about 10 miles, between Répalle village and the sea, there were 44 breaches. Every bank in the Divi Island of Avanigedda Division has been breached. Every effort is being made to repair the damages to irrigation and navigation works; and it says much for the resourcefulness and energy of the Public Works Department Officers, that I have had hardly a single complaint of deficiency of water. In one way or another, irrigation is being supplied wherever it is wanted.

24. Local Fund works have suffered less than might have been anticipated. There are not many metalled roads in the flooded area. The Iskapalle road, which runs throughout its course, athwart the line of drainage, received the full brunt of the flood, and was under water for a fortnight. The estimate for its repairs is nevertheless less than Rs. 2,000. The Sub-Collector reports that the roads in Répalle Union have ceased to exist, and a solitary lamp-post is the only relic of Union works left. Kollur, Iskapalle, Bhattiprole and Avanigedda Unions also suffered heavily. But I do not hear of any noticeable damage to Government or Local Fund buildings.

25. Of private houses, thousands must have collapsed. In Guntúr taluk alone, which suffered but little, the number of fallen houses is given as 908. Those built of brick and mud, especially of sun-dried bricks, are in far worse plight than the mud huts of the lower classes. The former melted away into absolute ruin, but while the mud walls of the latter collapsed, the timber supports, on which the roof rests, generally stood firm, and it was only where the rush of water was great that the roofs were washed away. Assistance in the shape of building materials is being freely given to those entitled.

26. The loss of crops was very great. The floods were out for so many days that all dry crops within the water-spread perished. The chief of these were maize and cholum. Paddy was in the transplantation stage, much still in the seed beds, and the rest but a few days in the field. In either case it was too young to withstand so long a submersion; and the receding waters exposed an absolutely verdureless tract of brown mud. But it would be premature now to attempt any estimate of the ultimate effect on the crop outturn, or on the public revenue. In many villages as fast as the flood receded, the ryots braced themselves with vigour to the task of transplanting afresh. On the 21st August, I found the ryots in some of the flooded villages of Bandar taluk bringing in paddy seedlings from Gudivada taluk; and the Divisional Officer, writing to me a few days later, reported that seedlings were coming in

in cart-loads. There was apparently more despondency in Répalle taluk. They talked of growing dry crops, or leaving the fields waste, and in the season report for the week ending 3rd September, the Tahsildar reports that in the southern parts of the taluk agricultural operations are at a stand still. But I do not take a gloomy view of the situation. The Répalle ryots have as much pluck and energy as their neighbours in the Bandar taluk. The irrigation works are being repaired with the utmost possible despatch; the Sub-Collector and Tahsildar are on the spot encouraging and helping the ryots, and I shall be surprised if the area under wet crop in the taluk turns out eventually to be less than that of last year.

27. In my telegram, dated 21st August, I applied to the Commissioner of Revenue Settlement for an allotment of Rs. 10,000 to meet the cost of relieving distress. One datum of my estimate was an estimated cost of Rs. 12 per bag of rice. But I subsequently ascertained that the bags which the District Superintendent of Police was purchasing were small bags, costing about Rs. 6. The allotment of Rs. 10,000 [which was provisionally sanctioned by the Board in B. P. (R. S.), dated 25th August 1896, Mis. No. 4174], will be far in excess of requirements. The actual cost, as advised up to date, is Rs. 2,640–6–7 as ascertained in my Treasury Office. But there are still bills outstanding for hire of Public Works Department steamer, punts, &c., wages of puntmen and other items. The accounts will be made up as early as possible.

28. An experience such as that the district has just gone through makes us sensitively conscious of our weak points; and these it behoves us to attend to now, lest a worse calamity happen hereafter. The principal defects are, of course, those in the works over which the Public Works Department has control; and the Superintending Engineer will doubtless have much to say on this subject. I shall venture only to trespass into his province so far as the flood-embankments are concerned. It is on the integrity of these embankments that the safety of life and property, public and private, over hundreds of square miles of country depends. The banks should be made absolutely safe against any possibility of a breach. How far removed they are from this standard of safety is attested not only by the many breaches that occurred, but by the scores of weak places and low places, where only constant watchfulness and unremitting labour prevented further breaches. I myself traversed almost the whole extent of the 15 miles or thereabouts between Kollur and Vallabhapuram not once, but three or four times during the 5th, 6th and 7th August. In this stretch there were, I should say (writing from memory) a dozen places where the bank had to be raised or strengthened by forced labour and at forced speed. Places hurriedly made safe on the 5th were found to be unsafe on the 6th. On the 7th morning, I found at Vallabhapuram a long stretch of upwards of a quarter of a mile, where the water was just lapping on to the top of the bank. The Public Works Department Overseer had done all he could the day before, which consisted in a thin crest of mud three or four inches high and a foot thick protected from wave action by palmyra leaves. Fortunately the river had begun to fall; had the rise continued, or had the wind shifted to the east, I think there must have been a breach at that point—a breach which would have inundated the whole of Répalle taluk, and would have caused lakhs of rupees of damage—and yet there were long distances between Vallabhapuram and Kollur, where the top of the bank was six or eight feet above maximum flood-level.

29. To allow such a state of things to continue is both unreasonable and criminal. It invites disaster. Government has undertaken to protect the lives and property of the people, but so long as the flood-banks remain in their present condition, the duty is left undone. I need hardly refer to the serious loss of revenue, let alone the immense damage to Government property that must ensue on any considerable breach in the embankment.

30. Nor is it enough to say that the Public Works Department Officers ought to see that the banks are properly kept up. They have neither the time nor the money. The inadequacy of the establishments and the insufficiency of the allotments to this Delta have constantly been brought to notice. I believe that the Superintending Engineer contemplates applying for a permanent increase in the superior staff; and in this he has my fullest support. Government must now face a very large expenditure to make the flood-embankments alone safe; and money cannot be economically laid out without an adequate Executive staff. During the last four years I have had very

full opportunities of judging of the amount of work that the Public Works Department Officers have to get through; and my opinion, whatever it may be worth, is that two Executive Engineers are insufficient for the vast amount of work there is to be done in the Delta.

31. Returning more particularly to the flood-embankments, I would submit that they should forthwith be made up to an adequate height and section, whatever that may be decided to be; and that hereafter they be kept at that standard throughout their whole length. There is some question whether a flood-embankment should be constructed on the right bank above the anicut. At present this bank is unprotected, and, in consequence, 90 square miles of country were flooded. Opinions differ as to the necessity or expediency of now constructing an embankment. Certainly the absence of an embankment is not such a great danger as below the anicut. The area over which the flood can spread is limited, and there are no important public works to be protected. The water in floods rises gradually and the people can generally get off safely with their property, though not when, as in this year, they are surprised by an abnormal fresh. If there are no strong engineering reasons against such a course, I would recommend the construction of an embankment at this point, on the simple ground that Government should protect the lives and property of its subjects.

32. Another defect thrust very forcibly on every one's notice during the floods was the inadequacy of the present means of communicating with out-stations. At Kollur, I was only 26 miles from the anicut; yet, it took 48 hours to get a reply to any of my most urgent communications. Places lower down on the same side were almost entirely cut off. The only means of forwarding letters was by peon or lock-tappal. It was impossible to give timely warning of any anticipated disaster, or to learn what had happened elsewhere. I consider that it is a matter of prime importance that the principal lines of canal should be provided with telegraphic connection with Bezwada and Sitanagaram. If open to the use of the public, such lines would not improbably be pecuniarily profitable as they would tap many important villages.

33. The next defect is a small one and can easily be remedied. I allude to the insufficiency of the ferry-boats (ballakats) at present provided on the canals. An experience of my own will again illustrate the difficulty. I had received intelligence of a weak place in the embankment some miles above my camp on the West Bank Canal, and I hurried to the spot. The embankment formed a narrow strip of dry land between the river on one side and the canal, there about 8 feet deep, on the other. The karnam who was with me told me he had already sent for coolies; and on reaching the spot, I found three men sitting down on the flood-embankment helplessly. They had no tools and could only watch the rapidly-increasing leak through the embankment. On the other side of the canal were half a dozen men sitting down as helpless. They had tools, but there was no ferry-boat and they could not swim. The nearest ferry was 3 miles down stream. To have sent the coolies round would have meant at least 2 hours delay; and more probably the decamping of the coolies. I got them over, no matter how; but it was a critical situation. This is only one instance; there were many others, to show how inadequate are the means of crossing the canals.

34. One other matter, that I can probably myself remedy, is the imperative necessity for moving all villages from the outer or river-side of the embankment to the inner or landward side. There are several villages that have of necessity been thus left outside the pale of protection. Most of them try feebly to protect themselves by petty ring-bunds. The latter inevitably breach in any fresh of unusual height, and instantly the villagers breach the flood-embankment at the back of their village, hoping thereby to divert the whole volume of the Kistna through the breach. It was admitted to the Sub-Collector that the breaches in the embankment of Pedapulivarru were caused in this way; and he has formed the conclusion after enquiry that, with the exception of the Kollur breaches, all those in the west flood-embankment, 12 in number, were so caused. At Chilumudi, 6 miles above Kollur, the Tahsildar of Répalle, who fortunately happened to be on the spot, was able to prevent the villagers from a like act of madness. I am taking steps to have all these villages moved to the inner side of the embankment.

35. It would be impossible to mention the names of all those who deserve commendation for their self-sacrificing devotion to duty during this trying time. With scarcely an exception, all Government Officers were lavish in their self-expenditure, and always cheerful however uncomfortable and however exhausted. Messrs. Hasted, Kearns, Haden and the Tahsildar of Bandar taluk, M.R.Ry. K. Maktesvara Row may be specially mentioned for the prolonged and extreme discomfort and at times danger that they underwent. The last-named officer, I have been able in some measure to reward already by promotion in rank. Mr. Gillman, not yet recovered from a broken leg, was always on the move wherever he was wanted. The Tahsildar of Répalle taluk, M.R.Ry. G. Lakshmikanta Row, though in enfeebled health, exposed himself freely in all weathers and at all hours. It is largely due to him that what would have proved a most disastrous breach was prevented about six miles above Kollur on the west flood-blank. During the two and-a-half days I remained in the neighbourhood of Kollur, I received most energetic aid from my own Vernacular Head Clerk D. V. Subba Row and from a Sub-Inspector in the Salt and Abkári Department named Ahmadulla Khan. I desire especially to bring the latter to the notice of the Commissioner. He rendered invaluable assistance in rescuing the Malas and Madigas of Kollur, besides helping to watch and strengthen many miles of embankment. Doubtless there were many others whose work did not come under my immediate observation, but who equally deserve mention.

36. Of private individuals I have already mentioned four English clergymen, the Zemindar of Challapalli and my late Huzur Sheristadar, who were ready to aid in the good work. Mr. Hasted tells me that the Muhammadan Jemadar of the Zemindar of Challapalli was of great service. Much unostentatious charity and self-sacrifice among the villagers must go unrecorded. It is worthy of note that more than one officer found, when supplies of food were running short, that the men voluntarily and gladly gave up their portions to the women. At Kollur the men had no thought for their own safety, till the women and children had been taken off. At Ibrampatnam a wealthy boat-owner, Mallela Venkatasubbayya, was prompt to send off his boats to rescue his neighbours in danger though his own property was threatened. Gorraparti Subbayya, a wealthy ryot of Pesarlanka, an island in mid stream, sheltered and fed all the poorer people on the island for four days. It is in such great calamities as this probably that the innate kindliness of the native character shows at its best.

37. It is not my business to offer any remarks on the conduct of the officers of the Public Works Department, but I cannot refrain from mentioning again the vigilance and devotion of the Superintending Engineer and the Executive Engineer, Kistna Northern Division. Without hazarding a definite opinion on what is a matter of scientific uncertainty, I may at least say that it seems probable that but for the exertions and the watchfulness of these two officers, the head-works at one or both sides of the river would have succumbed to the strain thrown upon them.

Enclosure.

Extract from the Water Register Book of Bezwada Station from 27th July 1896.

Date.	Height of water above the anicut in feet at		
	6 A.M.	12 A.M.	6 P.M.
	FEET.	FEET.	FEET.
27th July 1896	29·15	29·65	30·25
28th ,, ...	31·15	31·50	31·90
29th ,, ...	32·65	33·25	33·85
30th ,, ...	35·05	35·65	36·05
31st ,, ...	36·85	37·15	37·40
1st August 1896	38·25	38·65	39·05
2nd ,, ...	39·55	39·75	39·75
3rd ,, ...	39 85	39·95	39·95
4th ,, ...	40·05	40·20	40·40
5th ,, ...	40·70	40·80	40·85
6th ,, ...	41·20	41·25	41·30
7th ,, ...	41·30	41·10	40·95
8th ,, ...	40·55	40·35	40·05
9th ,, ...	39·25	38 65	38·00
10th ,, ...	37·05	36 65	36·30
11th ,, ...	35·65	35·25	34·85
12th ,, ...	34·15	33·85	33·50
13th ,, ...	33·15	32·95	32·85

Date.	Height of water above the anicut in feet at		
	6 A.M.	12 A.M.	6 P.M.
	FEET.	FEET.	FEET.
14th August 1896	33 10	33·30	33·50
15th ,, ...	33·85	33·95	34·05
16th ,, ...	33·95	33·95	34·10
17th ,, ...	34·65	34·85	35·00
18th ,, ...	35·30	35·45	35·30
19th ,, ...	35·20	35 25	35·35
20th ,, ...	35·85	36·25	36·55
21st ,, ...	37·00	37·15	37·25
22nd ,, ...	37·25	37·25	37·10
23rd ,, ...	36·55	36·15	35·65
24th ,, ...	34·45	33·95	33·45
25th ,, ...	32·45	32·15	31·75
26th ,, ...	31·25	31·00	30·65
27th ,, ...	30·00	29·75	29·45
28th ,, ...	29·10	28·95	28·75
29th ,, ...	28·50	28·25	28·20
30th ,, ...	27·95	27·85	27·80

Resolution—dated 5th October 1896, No. 259.

The report read above on the recent floods in the Kistna will be submitted to Government.

2. The river began to rise on the 27th July and continued steadily to do so until the evening of the 6th August when it reached its highest level of 41·30 over, the crest of the anicut. The river stood at or about this height for two whole days and then gradually fell to 32·85 on the 13th August; it rose again slightly till the 21st August on which date 37·25 feet were registered. Subsequently, however, it began to fall, and on the 30th of the month it was only 27·80 above the crest of the anicut.

3. The Collector's report shows that no less than fourteen breaches occurred in the river flood-bank in the Western and nine in the Eastern Delta. In the Northern Division there was only one breach. The largest breaches were at Kollur on the western and Pulipoka on the eastern side. The large volume of water escaping through the breaches spread itself over an area of about 1,000 square miles—400 square miles on the west and 600 square miles on the east of the river. Besides this a tract, about 90 square miles in extent, was flooded on the right bank of the river above the anicut, and another, less in extent, on the left bank, caused by the breach in the flood-bank at Ibrampatnam. The canals have breached in a large number of places. The head-works were at one time in serious danger but were saved by the exertions of the Superintending Engineer and the Executive Engineer of the Northern Division.

4. None of the officers of the Public Works or the Revenue Departments were on the spot during the earlier stages of the floods, except the newly-appointed Head Assistant Collector, Mr. Cumming; but, on information reaching them, all hastened to the spot. Just before the flood reached its highest level, the Acting Commissioner of Revenue Settlement arrived at Bezwada, and, in the absence of the Collector, organized the first arrangements for relief and rescue of the people in the inundated tract (paragraphs 6 to 12 of the Collector's report).

5. The Acting Commissioner is glad to bear testimony to the extreme promptness and self-sacrifice with which, with one exception, the officers of the various departments for whose services he had occasion to apply, acquitted themselves. It is chiefly due to their exertions that several hundreds of human beings were saved from death by drowning or starvation. Before Mr. Gillman could reach the spot from Guntúr, Mr. Keeling, Executive Engineer, did valuable services in rescuing persons from the inundated tract on the right bank of the river above Sitanagaram. Mr. A. R. Cumming, C.S., worked with him. Although crippled by a recently broken leg, Mr. Gillman was on the spot as soon as possible from Guntúr, and worked night and day for several days, until all were rescued. The Acting Commissioner could not issue orders to officers of the Salt and Abkári Department; but, at the first hint from him of what he thought the Head of that Department would approve, Messrs. Kearns and Haden set off at once for the scene of distress. The Collector has, if anything, understated the zeal and energy displayed by these two officers. Mr. Hasted, the Superintendent of Police, also acted at once on the Acting Commissioner's advice, and organized and administered relief energetically in the tract to which his attention was directed. Mr. Cumming, the Acting Head Assistant, as might be expected, was active in his own division. Mr. Atkinson, coming up rapidly from Chinna Ganjám, threw himself by instinct on the exact area where he was most wanted, and to his exertions is chiefly due that the right bank of the river below Sitanagaram was saved for a length of many miles. Every available officer had already been assigned a task, and there was no one who could be spared to go to the area in which Mr. Atkinson worked. The Superintending Engineer has probably brought to notice the valuable services rendered by the officers of his own Department. He has no doubt said nothing about himself, and the Acting Commissioner begs leave to state that, in all probability, to Major Baddeley's prompt resourcefulness is due the safety of the head-works, and consequently of the whole Delta.

6. Only seven cases of death have been reported, and the Collector considers that two of them may be due to natural causes. Though the number is extraordinarily small, the Collector sees no reason to suppose that reports of deaths have been

suppressed. Several persons, as already stated, were saved by the officers above-named when within a hair's breadth of being drowned. As generally happens in such cases it was the poorer classes of villagers—Panchamas, Madigas and Muhammadan paupers—who suffered most from the calamity, and many of these would doubtless have perished from starvation were it not for the prompt and timely relief given to them in the shape of food not only by the officers of Government, but by several private individuals. Among the latter were the Zemindar of Challapalli, the retired Huzur Sheristadar M.R.Ry. K. Narayanasami Naidu Garu and Gorraparti Subbayya, a ryot of Pesarlanka. The Board has no doubt but that, prompted by what the Collector calls the "innate kindliness of the native character," many more of the well-to-do villagers in the affected tracts also contributed to the relief of their distressed neighbours. The Collector also mentions the name of Mallela Venkatasubbayya, a wealthy boat-owner of Ibrampatnam, who promptly sent off his boats to rescue his neighbours in danger, though his own property was threatened. Two English clergymen (the Rev. Messrs. Harrison and Peachey) carried help to the sufferers in the low-lying country between Kankipad and Tsallapalle, and were instrumental in relieving some 330 persons who had no food. Two other clergymen (the Rev. Messrs. Goodman and Wathen) also volunteered to carry help to those in the Budameru valley; but, before they could reach the spot, all danger was over.

7. The total mortality among cattle is not yet known; but the Collector thinks that it cannot be large, as only 66 cattle are reported to have died over an area of 90 square miles, for which reliable information has been received.

Thousands of houses, especially of the poor, must have fallen down, and the Collector has arranged for the free grant of building materials to those deserving of this form of help. In the Guntúr taluk alone, so many as 908 houses are reported to have been destroyed, though that taluk suffered least from the floods.

8. The loss of crop caused by the floods is reported to be very great. The dry crops which were on the ground at the time, chiefly maize and cholum, have all been destroyed owing to their continuous submersion; but the Collector states nothing as to the necessity for granting any dry remissions in the affected tracts. The ryots had still ten months of the fasli to work in and have no doubt, already set to work. The Acting Commissioner himself noticed large tracts, which had been submerged, covered by waving maize in his recent tour. It must be remembered that a catastrophe like the present one is largely counterbalanced by the rich deposit of silt which the floods leave behind them, from which luxuriant crops may be expected in coming years. As regards wet cultivation, the transplanting began only a short time before the floods; but the crops thus planted, as well as the seedlings in the seed-beds, have all been washed away. The Collector, however, is strongly of opinion that the whole of the wet area will soon be under crop. In the Bandar taluk the ryots have already set to work in this direction, and it is anticipated that the Répalle ryots have also set to work by this time, though they were in a desponding mood at first. There may be some difficulty in procuring the necessary quantity of seedlings; but these are being imported by the Bandar ryots from the Gudiváda taluk; and if, as the Deputy Collector reports, seedlings are coming into Bandar in cart-loads from Gudiváda, the Répalle ryots may also arrange to obtain the seedlings they require from that taluk.

As observed by the Collector, however, it is too early to attempt to form an estimate of the ultimate effect of the floods on the extent and the outturn of crops, and the probable amount of remissions that may have to be granted. A detailed report should, however, be submitted on the subject as soon as practicable.

9. From paragraph 27 of the Collector's report, the Board is glad to observe that the amount of Rs. 10,000 provisionally sanctioned for the relief of distress in Board's Proceedings, dated 25th August 1896, Mis. No. 4174, will be found to be in excess of requirements. It is stated that only Rs. 2,640–6–7 have been spent up to date, but that there are still some outstanding bills to be paid. The amount of these bills will not apparently be large.

10. In paragraphs 28 to 34, the Collector makes certain proposals based on the experience of the floods. These proposals are briefly—

(1) that a third Executive Engineer should be appointed for the Delta;

(2) that the flood-embankments of the river should be forthwith made up to an adequate height and section, whatever that may be decided to be, and that provision should be made for that standard being kept up throughout their whole length;

(3) that a flood-embankment should be constructed on the right bank above the anicut;

(4) that telegraphic connection should be established between Bezwada and the principal lines of canal;

The districts of Kistna and Gódávari are both exceedingly backward in telegraphic communications.

(5) that the number of ferry-boats on the canal should be increased; and

(6) that all villages on the outer or river-side of the embankment should be moved to the inner or landward side of the canal. The Collector states that he will himself see to the last proposal being carried out. The other proposals will be communicated to the Chief Engineer for Irrigation for such consideration as he may deem fit to bestow thereon.

11. The attention of Government will be invited to paragraph 35 of the Collector's report in which he mentions the names of officers not specially referred to above, who have rendered commendable service during this trying time and an extract of that paragraph will be communicated to the Commissioner of Salt, Abkári and Separate Revenue.

12. The Collector says nothing about the lengthening of the railway bridge at Bezwada, and the Acting Commissioner has heard with regret that the verdict of Mr. Upcott was unfavourable to Major Baddeley's recommendations on the subject. The matter is one, in the opinion of the Board, to be considered chiefly from the standpoint of an Irrigation Engineer. Mr. Upcott was not present when the flood was at its height, and no one who had not seen it could form any idea of the damages caused by the present railway bridge and its embankment. After a river passes an anicut, or even a culvert, it should be able to expand like a fan. The railway bridge is actually narrower than the anicut, and, to save two or three spans, the Railway Engineer has built an embankment, which causes the river to cannon across from the left to the right bank, and back again, the result of which is that the banks below are imperilled throughout their whole length. Even if the irrigation system should have to be debited with the cost, the Board is of opinion that Major Baddeley's suggestions should be adopted. Were it not for the parapet walls built by Colonel Hasted after the floods of 1882, the head-works would have been carried away on the present occasion, and the present flood is by no means the maximum possible. Had it not been that the south-west monsoon has been a general failure in the East Coast districts, the recent flood would have topped and carried away the head sluices. This may happen in any year.

(True Copy and Extract.)

(Signed) R. V. SRINIVASIAR,
Secretary.

Order—Mis. No. 4395, Revenue, dated 7th November 1896.

The foregoing report shows the damage caused by the recent floods in the Kistna district and the measures taken by the local officers to repair the damage and rescue the people in the flooded country. The Government notes with appreciation the valuable aid rendered by all the officers and by the private gentlemen referred to in the Collector's letter read above.

2. To prevent the recurrence of the difficulties experienced on the present occasion, the Collector makes several recommendations, of which a summary is given in paragraph 10 of the Board's Proceedings. The Collector proposes himself to carry out the last proposal, viz., to move the villages on the river side of the embankment to the inner side. The other proposals have been communicated by the Board of Revenue to the Chief Engineer for Irrigation. The Public Works Department will be requested to communicate in due course the orders that may be passed thereon.

3. Orders will be passed in the Public Works Department on the question of lengthening the railway bridge at Bezwada, referred to in paragraph 12 of the Board's Proceedings.

4. Paragraph 12 of the Collector's letter will be communicated to the Judicial Department for necessary action.

(True Extract.)

(Signed) LIONEL DAVIDSON,
Ag. Under Secretary to Government.

Order—No. 3378 W., dated 24th November 1896.

Communicated to officers concerned.

2. The necessary action will be taken in the Irrigation and Railway Branches on paragraphs 2 and 3 of the Revenue Department order.

(True Extract.)

Under Secretary to Government.

To the Superintending Engineer, II Circle.
„ Irrigation Branch.
„ Railway „

Exd. T. K. Narayana Aiyangar.

Public Works (1896) Department.

CURRENT No. 10349

A 159 B+R Bezwada

Order No. 3378 W dy 24th November 1896.

Communicated to officers concerned.

2. The necessary action will be taken in the Irrigation & Railway Branches on paras 2 & 3 of the Rev. Dept order.

From The Revenue Dept.

No. 4395

Dated 7th Nov 96

Received 14-11-96

Enclosures 1

Spare copies

SUBJECT.

passing orders on the Bdr proj rep: Kistna floods

S.E. II circle
Irrigation Branch
Railway Branch

23/11/96

BACK PAPERS.

G.O.	No.	Department.	Date.
	789-96	J. Pw.	22.9.96.

FURTHER PAPERS.

G.O.	No.	Department.	Date.

Standing
Y.6.

10

BOARD OF REVENUE (REV. SETT., L. RDS. AND AGRI.), 5TH OCT. 1896, No. 259.

Read the following papers:—

PROCEEDINGS OF THE BOARD OF REVENUE
(REVENUE SETTLEMENT, LAND RECORDS AND AGRICULTURE).

READ—the following letter from J. N. ATKINSON, Esq., Collector of Kistna, to the Secretary to the Commissioner of Revenue Settlement and Director of the Department of Land Records and Agriculture, dated Masulipatam, 12th September 1896, Dis. No. 3940-Ver. :—

I have the honour to report on the recent floods in the Kistna river. I had been in hopes of being able to send complete information as to loss of property, public and private, and for that purpose have delayed the report; but it is impossible to procure complete lists of such items as cattle lost and fallen houses; while it is altogether premature to refer to loss of crop, since the ryots are striving vigorously to repair their losses, and will probably replant almost the whole area that was destroyed.

2. I append a statement showing the readings of the river-level at the gauge above the anicut on the Bezwada side; and in examining these readings, it may be borne in mind that in the present floods, the water has been at a uniform level both at the Bezwada and the Sitanagaram head-sluices, whereas in the floods of 1882, the previous highest recorded, the greatest height attained at Bezwada was 40·05 feet and at Sitanagaram 40·70 feet.

3. The rise commenced on July 27th, and from that day steadily continued till the maximum flood-level of 41·30 was reached on the evening of 6th August, for three whole days the river standing at a higher level than the maximum in 1882. It happened that during the earlier stages of the flood, almost all District officials were absent from Bezwada; the Superintending Engineer and Executive Engineer, Kistna Eastern Division, being on tour in different parts of the Gudiváda taluk; the Executive Engineer, Northern Division, having proceeded to the Upland taluks, whilst I myself had gone to Chinna Ganjám on the south-west confines of the district. Only the Head Assistant Collector, Mr. Cumming, who had been a bare week in the district, remained at Bezwada. Information that a flood of unusual height was expected was, however, soon communicated, and all hurried back to the scene of action.

4. The following is approximately a complete list of breaches in the river flood-bank, with the dates on which they occurred :—

Western Delta.

1.	Ravi Anantavaram, hamlet of Penumudi ...	31st July, at night.
2. 3.	Kollur (two breaches)	1st August.
4.	Pedapulivarru (one breach)	
5 6.	Pallepalem (two breaches)	
7.	Turpupalem (one breach)	
8. 9 10.	Penumudi (three breaches)	
11.	Kaytepalli (one breach)	
12. 13. 14.	Pedapulivarru (three breaches)	5th „

Eastern Delta.

1. 2. 3. 4. 5. 6.	Kottapalem and Kokkiligada breaches, six in all	1st August.
7.	Avanigadda	1st "
8.	Pulipaka	2nd "
9.	Pulugedda	2nd "

Northern Division.

1.	Ibrampatnam	6th August.

Complete information has not been received from the Divi Island (Avanigadda Division), and it is probable that other breaches occurred below Avanigadda village; but as that part of the country is sparsely inhabited, any damage that may have been caused would by comparison be insignificant. The highest breach on the western side was at Kollur about 25 miles below the anicut; and on the eastern side, omitting the Ibrampatnam breach, at Pulipaka only about 7 miles below the anicut. It was these two that caused the greatest danger and devastation, sending a huge volume of water over the greater portion of the Répalle and Bandar taluks, respectively, so that spreading out fanwise, the flood eventually covered about 1,000 square miles of country, widening the actual mouth of the Kistna to something like 50 miles from Masulipatam to Perali in the Bápatla taluk.

5. I cannot enumerate the various breaches to canals, nor will I attempt to write the history of the struggle to save the head-works at Bezwada and Sitanagaram. We, laymen, were told by the Engineers that for some time the head-works were in great danger; and what we saw was the platforms of the head-sluices covered by some inches of water, so that a rise of less than a foot would have brought the water over the top of everything into the canals; we could feel the masonry quivering to the enormous pressure of water; and we saw, as the water fell, how alarming had been the erosion of revetments and the subsidence of solid masonry walls. What would have happened had the water breached the head-works, no man can divine; but that there must have been appalling loss of life and property seems certain, and it is not impossible that the present system of irrigation would have had to be almost re-constructed. A deep debt of gratitude is due to the Engineers, especially the Superintending Engineer and the Executive Engineer, Kistna Northern Division, whose watchfulness and forethought never flagged for a moment. For several nights all officers of the Public Works Department were without sleep. Every thing was done that could be done, and it may be well surmised that but for the precautions taken, the works would have been unable to withstand the enormous strain that was thrown upon them.

6. The Commissioner of Revenue Settlement had come to Bezwada on 2nd August, and to him I am indebted for having organised the first arrangements for rescue of life and property. Before this on the 1st, Mr. Cumming had proceeded in company with Mr. Keeling, taking the Public Works Department steam-launch and some boats, to bring off the inhabitants of the villages on the right bank above the anicut, where the flood-water speedily submerged a tract measuring 90 square miles. On the morning of 2nd August, Mr. Cumming had to hurry back to his own division which was being inundated through the Pulipaka breach. The work of rescue from the submerged villages above the anicut was continued day by day by the Executive Engineer, Kistna Northern Division, and the Sub-Collector till the 8th by which time about 2,000 persons and many cattle had been placed in safety.

7. Mr. Cumming had proceeded on the 2nd, as just stated, to the neighbourhood of the Pulipaka breach, where he commenced an active crusade in such boats as he could pick up, to bring off people and property from villages in danger. In all about 425 persons were brought off.

8. On the 4th, the Commissioner directed Messrs. Kearns (Assistant Commissioner, Salt and Abkári) and Haden (Inspector, Salt and Abkári) to work through the low-lying country between Kankipad and Tsallapalle. These officers had a most laborious task and did it to perfection. For a considerable part of the distance, boats either

could not be procured, or could not be taken in the desired direction: and it was necessary that most of the work should be done on foot, for hours and hours at a time, in mud and water reaching from the knee to the chest, with scanty meals snatched at irregular intervals; and once without any food for a whole day. I have learnt that part of the work was done in uniform, and the wear and tear of clothing and shoe-leather was very serious.

9. On the 5th, the Commissioner wired to the Superintendent of Police to proceed to the tract of country between Tsallapalle and the sea. On the same day, the Head-quarter Deputy Collector arrived in Masulipatam from a tour in Gudiváda; and these two officers, after encountering the most vexatious opposition and obstruction from boatmen and others, started on the morning of 6th to visit all the low-lying tract between Masulipatam and the river-bank near Tsallapalle. As it turned out, this was the place where danger and distress were greatest, and the relief operations had to be continued till the 21st. Mr. Hasted's experiences were only little less trying than those of Messrs. Kearns and Haden. Once he was twenty-eight hours without food or drink. For days together he had not a rag of dry clothing. Messrs. Kearns and Haden joined Mr. Hasted at Challapalli on the 11th and thence forward, the partly of four, including the Head-quarter Deputy Collector, worked in concert throughout a tract having its centre at Tsallapalle, with a diameter of about 20 miles. The number of people rescued from danger of drowning by the Superintendent of Police was about 350. I am glad to add that long before the arrival of Superintendent of Police or Divisional Officer, and without any instructions from any one, the Tahsildar of Bandar, K. Muktesvara Row, had, from the first appearance of danger, been working most energetically and indefatigably in preventing loss and damage and in succouring the distressed. By his sole exertions he preserved some miles of flood-bank from being overtopped and breached; and he succeeded even in closing several small breaches before the rush of water exceeded control.

10. I was myself at Chinna Ganjám, when late on the night of 2nd August, I got the first news of the expected flood. I started back the next day and reached the right river-embankment about 12 miles above Kollur at daybreak on the 5th. The Executive Engineer, Kistna Western Division, and the Sub-Division Officer were both at Kollur, and just before my arrival there, the Public Works Department Overseer arrived from a visit of inspection to villages lower down. Nothing could possibly be done to existing breaches. The duty at hand was to put people and their belongings in safety, and to take all possible steps to prevent further breaches. I spent the 5th and 6th in seeing that the large Mala and Madiga population of Kollur were rescued from a very perilous position, and in making the flood-bank as safe as practicable for 10 or 12 miles above Kollur. On 7th August, I proceeded to Sitanagaram, crossing to Bezwada the next morning.

11. On the 7th, the Commissioner of Revenue Settlement had accepted an offer from the Revd. Mr. Harrison and Revd. Mr. Peachey of Bezwada, to proceed on a relief expedition in the track of Messrs. Kearns and Haden. Like all others similarly employed, these gentlemen underwent much exposure and privation, and were instrumental in relieving some 330 persons who had no food. The Revd. Messrs. Goodman and Wathen of Masulipatam, also volunteered to carry help to those in the Budameru valley; but before they could reach the spot, all danger was over.

12. On the 6th, the Commissioner had wired to the Assistant Superintendent of Police saying that nothing could be heard of me, that I was probably cut off somewhere in Répalle taluk, and advising him to go to my relief. Mr. Dene did not go. On the 8th, I wired to Mr. Dene to proceed to Kollur and work through the worst parts of Répalle. He did not go, but sent me a letter on 9th asking for further instructions, and stating that he proposed to come to Sitanagaram on 10th to get a house-boat in which to travel. I sent him urgent orders the same day (9th) to start at once by road for Tenali. As it was raining, however, he found it impossible to start till the next day. I am glad to say that this was the only case that came to my notice in which orders issued were not at once obeyed.

13. I was very anxious about the state of the Divi Island from which I could get no information, and had wired to the Port Officer, Masulipatam, on the afternoon of 7th to send boats thither. The same night at 11 o'clock five large dhonies were

despatched to traverse the island in all directions. These boats rescued 117 persons, most of whom were found sitting on their house tops; and gave food to many more who declined to leave their homes. I was still much concerned for the villages along the long line of inundated seaboard, and on 8th, wired to the District Forest Officer in Masulipatam to visit them. He misunderstood the first message; but a second on the morning of 9th set matters right, and at noon on that day, he and the Assistant Conservator, Mr. Fischer, and the Forest Surveyor, Mr. Le Tang, started off in separate boats and separate directions, arranging at the same time to keep touch of one another. It was well they went; they found villages probably in worse plight than any hitherto visited; in one case the whole population had been 5 days without food, one boy having in consequence lost his reason; in another there was not an inch of dry land anywhere, and four poor women had been prematurely confined as they lay in six inches of water.

14. The day after my return to Sitanagaram, *i.e.*, on 8th August, I had despatched the Sub-Collector, still dependant on his crutches, to visit the worst parts of Répalle taluk; having already left the Tahsildar, an energetic and reliable officer, busy in the same good work.

15. The preceding paragraphs give the briefest outline of how the work of rescue and succour was organised, and being carried out. Every tract where danger was believed to exist was visited, and the worse parts not once or twice but constantly. The area on the east of the river was roughly about 600 square miles, and that on the west about 400 square miles in extent; but apart from this the intensity of the distress was much greater in the former. In the Répalle taluk I found, during the height of the floods, that all those who were washed out of their homes had saved ample stores of food; indeed so far as my inquiries went, no grain at all was lost on that side. The Sub-Collector, who continued my inquiries and who visited the worst parts of the taluk, as well as the Tahsildar and other local officers, reported that no relief was needed except materials to re-build fallen houses. In the way of food therefore, no relief was given in the Répalle taluk, except a meal apiece to 279 persons whom Mr. Dene found to be temporarily destitute.

16. In the Bezwada, Nuzvid and Bandar taluks, matters were very different. The people apparently had not foreseen what was coming; and their stores of grain were in many of the villages entirely destroyed. Those who thus suffered were almost all of the lowest and poorest classes—Malas, Madigas and poor Muhammadans; and it may be mentioned, as further explaining the difference between the two sides of the river, that there is a much larger proportion of poor Panchamas on the east than on the west of the river, at any rate in the Delta. Of those who were flooded out in the Guntúr taluk above the anicut, 711 were fed on different dates, these having been caught by the flood unawares.

17. The breach in the left or east flood-bank above Bezwada occurred on the morning of 6th August. It seemed to possess capabilities for mischief even greater than any of those in the Delta. Fortunately the land falls from the very site of the breach naturally and rapidly in and alongside an old drainage channel to the Budameru river, and the water that poured through the breach followed this course, leaving the adjacent villages unaffected, but submerging and breaching the Nizam's Guaranteed State Railway in its progress to the Budameru channel, which luckily was dry. The water followed the Budameru to the Colair lake, and though it threatened at one time to breach the East Coast Railway, and did actually submerge three or four villages in Gudivada taluk, and breach many of the Government channels, the damage done was comparatively insignificant and certainly much less than was expected.

18. Considering all the circumstances, the loss of human life so far as reported has been extraordinarily small. I have inquired in all directions from private as well as official sources, but I can find no reason to suppose that reports of deaths have been suppressed. Every endeavour was made to systematise the work of rescue, but exact instructions are impossible, and would probably be risky in such abnormal circumstances. To a very large extent officers must be left to rely on their own judgment and initiative; and when it is remembered how many there were that came within measurable distance of not being succoured in time, the 50 persons whom Mr. Lushington relieved from a 5 days' fast; the many hundreds that were brought off

in scores of different villages when the water was on the point of submerging everything; the unfortunates whom Mr. Hasted released from the tops of palmyra trees, their only coign of safety, by means of the Chellapalli elephants; the two men whom Deputy Collector Muhammad Aziz-ud-din Hussain Saheb found long after night-fall up to their necks in water crying for help; when these and the innumerable other narrow escapes are remembered, one can regard it as nothing less than marvellous that the death-roll is so small. In all, seven deaths have been reported, but it is at least uncertain whether two of them were due to the floods. Two children were drowned at Pedda Yadara, Bandar taluk; and two men at Pedaprolu in the same taluk while trying to cross a deep and rapid channel were swept away. One old man was crushed by the fall of a house at Pesarlanka in Répalle taluk. Besides these the body of a man was found stuck in some bushes within 5 miles of Masulipatam town; and another male body very much decomposed was found by the Répalle Tahsildar caught in a babúl tree not far from Kollur. But these two last may be bodies of those who had died from natural causes. Mr. Harrison saw a dead body in a tree, but whether of a human being or an animal he could not say.

19. The death-roll of cattle is not yet made up, nor do I suppose that exact figures will ever be procurable. Detailed reports will, however, be obtained from every village as early as possible. I anticipate that, as in the case of human beings, the numbers will be found surprisingly small. Thus in the 90 square miles of submerged country above the anicut in the Guntúr taluk, from which the statistics are almost complete, it is reported that only 66 beasts have been drowned, and that though these villagers were taken by surprise and cut off by a broad sheet of deep water almost before they knew the flood was approaching. Some animals were seen as they were swept over the anicut. For these there was little hope; but one particularly fine bull struggled ashore, and with difficulty clambering up the steep railway bank, stood to rest himself on top; the next moment an engine rushed along, and the scarce-rescued animal was its victim.

20. Both men and cattle, however, ran a risk of starvation almost as great as that of drowning. As noticed above, all supplies of food-grain had been completely destroyed in scores of villages, and the poorer classes, livers from hand to mouth, unable to obtain employment while the water covered the ground, had only State aid and private charity between them and death. Private charity here and there did much. The Zemindar of Chellapalli fed many hundreds of destitute persons in his estate so long as the floods continued; the late Huzur Sheristadar, M.R.Ry. K. Narayanaswami Naidu, gave food for some days to a large number of refugees from villages near the seaboard; in many of the inundated villages the wealthier classes, whose houses were on a safe elevation above the floods, distributed food to their less fortunate neighbours. But there was no organization of private charity, even the many local branches of the District Association having failed to seize this opportunity for tangible public beneficence. It therefore fell to the State to relieve the great destitution in which so many hundreds were plunged.

21. The distribution of State relief commenced on 2nd August to certain of those who had been brought from the tracts above the anicut, and continued till 28th August. The numbers fed on each day, so far as ascertained, were as follows:—

August,	2nd	...	...	142	August,	14th	...
"	3rd	...	...	86	"	15th	...
"	4th	...	...	46	"	16th	...
"	5th	...	...	229	"	17th	...
"	6th	...	...	444	"	18th	...
"	7th	...	...	703	"	19th	...
"	8th	...	...	405	"	20th	...
"	9th	...	...	782	"	27th	...
"	10th	...	...	1,008	"	28th	...
"	11th	...	...	1,369			
"	12th	...	...	918			
"	13th	...	...	1,052		Total	...

August,	14th	...	2,204
"	15th	...	900
"	16th	...	850
"	17th	...	400
"	18th	...	140
"	19th	...	137
"	20th	...	137
"	27th	...	6
"	28th	...	13
	Total	...	11,971

In addition to the above, Mr. Lushigton's relief party fed 2,419 persons in the five days, 10th to 14th August inclusive (the details for each day not having been furnished), making a grand total of 14,390 persons relieved from want of food. A word of explanation is necessary as to the 19 persons relieved on 27th and 28th

August. The river had begun to rise again on 16th and continued rising till 23rd. On the evening of 23rd August, I got a report from a Forest Range Officer, who had just come from Divi Island, that many of the villagers were again totally submerged, and that the poorer classes were in a dangerous state of destitution. I at once despatched Deputy Collector T. V. Narayanasawmi Iyer, who, however, found that the water had already begun to subside and that only 19 persons required relief.

22. The case of the cattle was even more pitiable, if possible, than that of the human beings. Over an enormous extent of country the grass was submerged for upwards of a fortnight. Straw ricks were either submerged, swept away, or spoilt. Many animals made their way by instinct through great stretches of water, wading and swimming, to knolls and ridges of high ground which they soon stripped bare of all verdure. Some were fed by straw imported by boat across the floods; very many others were driven, so soon as opportunity served, to the Upland taluks; and some were kept alive with thatch, palmyra leaves and any fodder procurable. All river-side and coast Forest Reserves were thrown open to free grazing, but most of these were of course under water. The total mortality among cattle is not known yet.

23. The loss of public and private property has of course been very heavy. The repairs to irrigation works and to the river conservancy works will cost many lakhs of rupees. I cannot give details of damages which will doubtless be reported by the Superintending Engineer, but a few instances will illustrate the extent of the disasters. The Bezwada-Masulipatam canal for a distance of about eight miles has been riddled. At one point, six furlongs of the left bank in a continuous line have been washed away. Passing by many minor breaches, there were, in these 8 miles, three enormous gaps from side to side of the canal 300 or 400 feet broad, where the scour-holes on either side were 10 to 15 feet below bed-level of the canal. In the Iskapalle channel, which runs roughly parallel to the coast line, for about 10 miles, between Répalle village and the sea, there were 44 breaches. Every bank in the Divi Island of Avanigedda Division has been breached. Every effort is being made to repair the damages to irrigation and navigation works; and it says much for the resourcefulness and energy of the Public Works Department Officers, that I have had hardly a single complaint of deficiency of water. In one way or another, irrigation is being supplied wherever it is wanted.

24. Local Fund works have suffered less than might have been anticipated. There are not many metalled roads in the flooded area. The Iskapalle road, which runs throughout its course, athwart the line of drainage, received the full brunt of the flood, and was under water for a fortnight. The estimate for its repairs is nevertheless less than Rs. 2,000. The Sub-Collector reports that the roads in Répalle Union have ceased to exist, and a solitary lamp-post is the only relic of Union works left. Kollur, Iskapalle, Bhatiprole and Avanigedda Unions also suffered heavily. But I do not hear of any noticeable damage to Government or Local Fund buildings.

25. Of private houses, thousands must have collapsed. In Guntúr taluk alone, which suffered but little, the number of fallen houses is given as 908. Those built of brick and mud, especially of sun-dried bricks, are in far worse plight than the mud huts of the lower classes. The former melted away into absolute ruin, but while the mud walls of the latter collapsed, the timber supports, on which the roof rests, generally stood firm, and it was only where the rush of water was great that the roofs were washed away. Assistance in the shape of building materials is being freely given to those entitled.

26. The loss of crops was very great. The floods were out for so many days that all dry crops within the water-spread perished. The chief of these were maize and cholum. Paddy was in the transplantation stage, much still in the seed beds, and the rest but a few days in the field. In either case it was too young to withstand so long a submersion; and the receding waters exposed an absolutely verdureless tract of brown mud. But it would be premature now to attempt any estimate of the ultimate effect on the crop outturn, or on the public revenue. In many villages as fast as the flood receded, the ryots braced themselves with vigour to the task of transplanting afresh. On the 21st August, I found the ryots in some of the flooded villages of Bandar taluk bringing in paddy seedlings from Gudivada taluk; and the Divisional Officer, writing to me a few days later, reported that seedlings were coming in

in cart-loads. There was apparently more despondency in Répalle taluk. They talked of growing dry crops, or leaving the fields waste, and in the season report for the week ending 3rd September, the Tahsildar reports that in the southern parts of the taluk agricultural operations are at a stand still. But I do not take a gloomy view of the situation. The Répalle ryots have as much pluck and energy as their neighbours in the Bandar taluk. The irrigation works are being repaired with the utmost possible despatch; the Sub-Collector and Tahsildar are on the spot encouraging and helping the ryots, and I shall be surprised if the area under wet crop in the taluk turns out eventually to be less than that of last year.

27. In my telegram, dated 21st August, I applied to the Commissioner of Revenue Settlement for an allotment of Rs. 10,000 to meet the cost of relieving distress. One datum of my estimate was an estimated cost of Rs. 12 per bag of rice. But I subsequently ascertained that the bags which the District Superintendent of Police was purchasing were small bags, costing about Rs. 6. The allotment of Rs. 10,000 [which was provisionally sanctioned by the Board in B. P. (R. S.), dated 25th August 1896, Mis. No. 4174], will be far in excess of requirements. The actual cost, as advised up to date, is Rs. 2,640–6–7 as ascertained in my Treasury Office. But there are still bills outstanding for hire of Public Works Department steamer, punts, &c., wages of puntmen and other items. The accounts will be made up as early as possible.

28. An experience such as that the district has just gone through makes us sensitively conscious of our weak points; and these it behoves us to attend to now, lest a worse calamity happen hereafter. The principal defects are, of course, those in the works over which the Public Works Department has control; and the Superintending Engineer will doubtless have much to say on this subject. I shall venture only to trespass into his province so far as the flood-embankments are concerned. It is on the integrity of these embankments that the safety of life and property, public and private, over hundreds of square miles of country depends. The banks should be made absolutely safe against any possibility of a breach. How far removed they are from this standard of safety is attested not only by the many breaches that occurred, but by the scores of weak places and low places, where only constant watchfulness and unremitting labour prevented further breaches. I myself traversed almost the whole extent of the 15 miles or thereabouts between Kollur and Vallabhapuram not once, but three or four times during the 5th, 6th and 7th August. In this stretch there were, I should say (writing from memory) a dozen places where the bank had to be raised or strengthened by forced labour and at forced speed. Places hurriedly made safe on the 5th were found to be unsafe on the 6th. On the 7th morning, I found at Vallabhapuram a long stretch of upwards of a quarter of a mile, where the water was just lapping on to the top of the bank. The Public Works Department Overseer had done all he could the day before, which consisted in a thin crest of mud three or four inches high and a foot thick protected from wave action by palmyra leaves. Fortunately the river had begun to fall; had the rise continued, or had the wind shifted to the east, I think there must have been a breach at that point—a breach which would have inundated the whole of Répalle taluk, and would have caused lakhs of rupees of damage—and yet there were long distances between Vallabhapuram and Kollur, where the top of the bank was six or eight feet above maximum flood-level.

29. To allow such a state of things to continue is both unreasonable and criminal. It invites disaster. Government has undertaken to protect the lives and property of the people, but so long as the flood-banks remain in their present condition, the duty is left undone. I need hardly refer to the serious loss of revenue, let alone the immense damage to Government property that must ensue on any considerable breach in the embankment.

30. Nor is it enough to say that the Public Works Department Officers ought to see that the banks are properly kept up. They have neither the time nor the money. The inadequacy of the establishments and the insufficiency of the allotments to this Delta have constantly been brought to notice. I believe that the Superintending Engineer contemplates applying for a permanent increase in the superior staff; and in this he has my fullest support. Government must now face a very large expenditure to make the flood-embankments alone safe; and money cannot be economically laid out without an adequate Executive staff. During the last four years I have had very

full opportunities of judging of the amount of work that the Public Works Department Officers have to get through; and my opinion, whatever it may be worth, is that two Executive Engineers are insufficient for the vast amount of work there is to be done in the Delta.

31. Returning more particularly to the flood-embankments, I would submit that they should forthwith be made up to an adequate height and section, whatever that may be decided to be; and that hereafter they be kept at that standard throughout their whole length. There is some question whether a flood-embankment should be constructed on the right bank above the anicut. At present this bank is unprotected, and, in consequence, 90 square miles of country were flooded. Opinions differ as to the necessity or expediency of now constructing an embankment. Certainly the absence of an embankment is not such a great danger as below the anicut. The area over which the flood can spread is limited, and there are no important public works to be protected. The water in floods rises gradually and the people can generally get off safely with their property, though not when, as in this year, they are surprised by an abnormal fresh. If there are no strong engineering reasons against such a course, I would recommend the construction of an embankment at this point, on the simple ground that Government should protect the lives and property of its subjects.

32. Another defect thrust very forcibly on every one's notice during the floods was the inadequacy of the present means of communicating with out-stations. At Kollur, I was only 26 miles from the anicut; yet, it took 48 hours to get a reply to any of my most urgent communications. Places lower down on the same side were almost entirely cut off. The only means of forwarding letters was by peon or lock-tappal. It was impossible to give timely warning of any anticipated disaster, or to learn what had happened elsewhere. I consider that it is a matter of prime importance that the principal lines of canal should be provided with telegraphic connection with Bezwada and Sitanagaram. If open to the use of the public, such lines would not improbably be pecuniarily profitable as they would tap many important villages.

33. The next defect is a small one and can easily be remedied. I allude to the insufficiency of the ferry-boats (ballakats) at present provided on the canals. An experience of my own will again illustrate the difficulty. I had received intelligence of a weak place in the embankment some miles above my camp on the West Bank Canal, and I hurried to the spot. The embankment formed a narrow strip of dry land between the river on one side and the canal, there about 8 feet deep, on the other. The karnam who was with me told me he had already sent for coolies; and on reaching the spot, I found three men sitting down on the flood-embankment helplessly. They had no tools and could only watch the rapidly-increasing leak through the embankment. On the other side of the canal were half a dozen men sitting down as helpless. They had tools, but there was no ferry-boat and they could not swim. The nearest ferry was 3 miles down stream. To have sent the coolies round would have meant at least 2 hours delay; and more probably the decamping of the coolies. I got them over, no matter how; but it was a critical situation. This is only one instance; there were many others, to show how inadequate are the means of crossing the canals.

34. One other matter, that I can probably myself remedy, is the imperative necessity for moving all villages from the outer or river-side of the embankment to the inner or landward side. There are several villages that have of necessity been thus left outside the pale of protection. Most of them try feebly to protect themselves by petty ring-bunds. The latter inevitably breach in any fresh of unusual height, and instantly the villagers breach the flood-embankment at the back of their village, hoping thereby to divert the whole volume of the Kistna through the breach. It was admitted to the Sub-Collector that the breaches in the embankment of Pedapulivarru were caused in this way; and he has formed the conclusion after enquiry that, with the exception of the Kollur breaches, all those in the west flood-embankment, 12 in number, were so caused. At Chilumudi, 6 miles above Kollur, the Tahsildar of Répalle, who fortunately happened to be on the spot, was able to prevent the villagers from a like act of madness. I am taking steps to have all these villages moved to the inner side of the embankment.

35. It would be impossible to mention the names of all those who deserve commendation for their self-sacrificing devotion to duty during this trying time. With scarcely an exception, all Government Officers were lavish in their self-expenditure, and always cheerful however uncomfortable and however exhausted. Messrs. Hasted, Kearns, Haden and the Tahsildar of Bandar taluk, M.R.Ry. K. Maktesvara Row may be specially mentioned for the prolonged and extreme discomfort and at times danger that they underwent. The last-named officer, I have been able in some measure to reward already by promotion in rank. Mr. Gillman, not yet recovered from a broken leg, was always on the move wherever he was wanted. The Tahsildar of Répalle taluk, M.R.Ry. G. Lakshmikanta Row, though in enfeebled health, exposed himself freely in all weathers and at all hours. It is largely due to him that what would have proved a most disastrous breach was prevented about six miles above Kollur on the west flood-blank. During the two and-a-half days I remained in the neighbourhood of Kollur, I received most energetic aid from my own Vernacular Head Clerk D. V. Subba Row and from a Sub-Inspector in the Salt and Abkári Department named Ahmadulla Khan. I desire especially to bring the latter to the notice of the Commissioner. He rendered invaluable assistance in rescuing the Malas and Madigas of Kollur, besides helping to watch and strengthen many miles of embankment. Doubtless there were many others whose work did not come under my immediate observation, but who equally deserve mention.

36. Of private individuals I have already mentioned four English clergymen, the Zemindar of Challapalli and my late Huzur Sheristadar, who were ready to aid in the good work. Mr. Hasted tells me that the Muhammadan Jemadar of the Zemindar of Challapalli was of great service. Much unostentatious charity and self-sacrifice among the villagers must go unrecorded. It is worthy of note that more than one officer found, when supplies of food were running short, that the men voluntarily and gladly gave up their portions to the women. At Kollur the men had no thought for their own safety, till the women and children had been taken off. At Ibrampatnam a wealthy boat-owner, Mallela Venkatasubbayya, was prompt to send off his boats to rescue his neighbours in danger though his own property was threatened. Gorraparti Subbayya, a wealthy ryot of Pesarlanka, an island in mid stream, sheltered and fed all the poorer people on the island for four days. It is in such great calamities as this probably that the innate kindliness of the native character shows at its best.

37. It is not my business to offer any remarks on the conduct of the officers of the Public Works Department, but I cannot refrain from mentioning again the vigilance and devotion of the Superintending Engineer and the Executive Engineer, Kistna Northern Division. Without hazarding a definite opinion on what is a matter of scientific uncertainty, I may at least say that it seems probable that but for the exertions and the watchfulness of these two officers, the head-works at one or both sides of the river would have succumbed to the strain thrown upon them.

Enclosure.

Extract from the Water Register Book of Bezwada Station from 27th July 1896.

Date.	Height of water above the anicut in feet at			Date.	Height of water above the anicut in feet at		
	6 A.M.	12 A.M.	6 P.M.		6 A.M.	12 A.M.	6 P.M.
	Feet.	Feet.	Feet.		Feet.	Feet.	Feet.
27th July 1896	29·15	29·65	30·25	14th August 1896	33 10	33·30	33·50
28th ,, ...	31·15	31·50	31·90	15th ,, ...	33·85	33·95	34·05
29th ,, ...	32·65	33·25	33·85	16th ,, ...	33·95	33·95	34·10
30th ,, ...	35·05	35·65	36·05	17th ,, ...	34·65	34·85	35·00
31st ,, ...	36·85	37·15	37·40	18th ,, ...	35·30	35·45	35·30
1st August 1896	38·25	38·65	39·05	19th ,, ...	35·20	35·25	35·35
2nd ,, ...	39 55	39·75	39·75	20th ,, ...	35·85	36·25	36·55
3rd ,, ...	39·85	39·95	39·95	21st ,, ...	37·00	37·15	37·25
4th ,, ...	40·05	40·20	40·40	22nd ,, ...	37·25	37·25	37·10
5th ,, ...	40·70	40·80	40·85	23rd ,, ...	36·55	36·15	35·65
6th ,, ...	41·20	41·25	41·30	24th ,, ...	34·45	33·95	33·45
7th ,, ...	41·30	41·10	40·95	25th ,, ...	32·45	32·15	31·75
8th ,, ...	40·55	40·35	40·05	26th ,, ...	31·25	31·00	30·65
9th ,, ...	39·25	38·65	38·00	27th ,, ...	30·00	29·75	29 45
10th ,, ...	37·05	36 65	36·30	28th ,, ...	29·10	28·95	28·75
11th ,, ...	35·65	35·25	34·85	29th ,, ...	28·50	28·25	28·20
12th ,, ...	34·15	33·85	33·50	30th ,, ...	27·95	27·85	27·80
13th ,, ...	33·15	32·95	32·85				

Resolution—dated 5th October 1896, No. 259.

The report read above on the recent floods in the Kistna will be submitted to Government.

2. The river began to rise on the 27th July and continued steadily to do so until the evening of the 6th August when it reached its highest level of 41·30 over the crest of the anicut. The river stood at or about this height for two whole days and then gradually fell to 32·85 on the 13th August; it rose again slightly till the 21st August on which date 37·25 feet were registered. Subsequently, however, it began to fall, and on the 30th of the month it was only 27·80 above the crest of the anicut.

3. The Collector's report shows that no less than fourteen breaches occurred in the river flood-bank in the Western and nine in the Eastern Delta. In the Northern Division there was only one breach. The largest breaches were at Kollur on the western and Pulipoka on the eastern side. The large volume of water escaping through the breaches spread itself over an area of about 1,000 square miles—400 square miles on the west and 600 square miles on the east of the river. Besides this a tract, about 90 square miles in extent, was flooded on the right bank of the river above the anicut, and another, less in extent, on the left bank, caused by the breach in the flood-bank at Ibrampatnam. The canals have breached in a large number of places. The head-works were at one time in serious danger but were saved by the exertions of the Superintending Engineer and the Executive Engineer of the Northern Division.

4. None of the officers of the Public Works or the Revenue Departments were on the spot during the earlier stages of the floods, except the newly-appointed Head Assistant Collector, Mr. Cumming; but, on information reaching them, all hastened to the spot. Just before the flood reached its highest level, the Acting Commissioner of Revenue Settlement arrived at Bezwada, and, in the absence of the Collector, organized the first arrangements for relief and rescue of the people in the inundated tract, (paragraphs 6 to 12 of the Collector's report).

5. The Acting Commissioner is glad to bear testimony to the extreme promptness and self-sacrifice with which, with one exception, the officers of the various departments for whose services he had occasion to apply, acquitted themselves. It is chiefly due to their exertions that several hundreds of human beings were saved from death by drowning or starvation. Before Mr. Gillman could reach the spot from Guntúr, Mr. Keeling, Executive Engineer, did valuable services in rescuing persons from the inundated tract on the right bank of the river above Sitanagaram. Mr. A. R. Cumming, C.S., worked with him. Although crippled by a recently broken leg, Mr. Gillman was on the spot as soon as possible from Guntúr, and worked night and day for several days, until all were rescued. The Acting Commissioner could not issue orders to officers of the Salt and Abkári Department; but, at the first hint from him of what he thought the Head of that Department would approve, Messrs. Kearns and Haden set off at once for the scene of distress. The Collector has, if anything, understated the zeal and energy displayed by these two officers. Mr. Hasted, the Superintendent of Police, also acted at once on the Acting Commissioner's advice, and organized and administered relief energetically in the tract to which his attention was directed. Mr. Cumming, the Acting Head Assistant, as might be expected, was active in his own division. Mr. Atkinson, coming up rapidly from Chinna Ganjám, threw himself by instinct on the exact area where he was most wanted, and to his exertions is chiefly due that the right bank of the river below Sitanagaram was saved for a length of many miles. Every available officer had already been assigned a task, and there was no one who could be spared to go to the area in which Mr. Atkinson worked. The Superintending Engineer has probably brought to notice the valuable services rendered by the officers of his own Department. He has no doubt said nothing about himself, and the Acting Commissioner begs leave to state that, in all probability, to Major Baddeley's prompt resourcefulness is due the safety of the head-works, and consequently of the whole Delta.

6. Only seven cases of death have been reported, and the Collector considers that two of them may be due to natural causes. Though the number is extraordinarily small, the Collector sees no reason to suppose that reports of deaths have been suppressed. Several persons, as already stated, were saved by the officers above-named

when within a hair's breadth of being drowned. As generally happens in such cases it was the poorer classes of villagers—Panchamas, Madigas and Muhammadan paupers—who suffered most from the calamity, and many of these would doubtless have perished from starvation were it not for the prompt and timely relief given to them in the shape of food not only by the officers of Government, but by several private individuals. Among the latter were the Zemindar of Challapalli, the retired Huzur Sheristadar M.R.Ry. K. Narayanasami Naidu Garu and Gorraparti Subbayya, a ryot of Pesarlanka. The Board has no doubt but that, prompted by what the Collector calls the "innate kindliness of the native character," many more of the well-to-do villagers in the affected tracts also contributed to the relief of their distressed neighbours. The Collector also mentions the name of Mallela Venkatasubbayya, a wealthy boat-owner of Ibrampatnam, who promptly sent off his boats to rescue his neighbours in danger, though his own property was threatened. Two English clergymen (the Rev. Messrs. Harrison and Peachey) carried help to the sufferers in the low-lying country between Kankipad and Tsallapalle, and were instrumental in relieving some 330 persons who had no food. Two other clergymen (the Rev. Messrs. Goodman and Wathen) also volunteered to carry help to those in the Budameru valley; but, before they could reach the spot, all danger was over.

7. The total mortality among cattle is not yet known; but the Collector thinks that it cannot be large, as only 66 cattle are reported to have died over an area of 90 square miles, for which reliable information has been received.

Thousands of houses, especially of the poor, must have fallen down, and the Collector has arranged for the free grant of building materials to those deserving of this form of help. In the Guntúr taluk alone, so many as 908 houses are reported to have been destroyed, though that taluk suffered least from the floods.

8. The loss of crop caused by the floods is reported to be very great. The dry crops which were on the ground at the time, chiefly maize and cholum, have all been destroyed owing to their continuous submersion; but the Collector states nothing as to the necessity for granting any dry remissions in the affected tracts. The ryots had still ten months of the fasli to work in and have no doubt, already set to work. The Acting Commissioner himself noticed large tracts, which had been submerged, covered by waving maize in his recent tour. It must be remembered that a catastrophe like the present one is largely counterbalanced by the rich deposit of silt which the floods leave behind them, from which luxuriant crops may be expected in coming years. As regards wet cultivation, the transplanting began only a short time before the floods; but the crops thus planted, as well as the seedlings in the seed-beds, have all been washed away. The Collector, however, is strongly of opinion that the whole of the wet area will soon be under crop. In the Bandar taluk the ryots have already set to work in this direction, and it is anticipated that the Répalle ryots have also set to work by this time, though they were in a desponding mood at first. There may be some difficulty in procuring the necessary quantity of seedlings; but these are being imported by the Bandar ryots from the Gudiváda taluk; and if, as the Deputy Collector reports, seedlings are coming into Bandar in cart-loads from Gudiváda, the Répalle ryots may also arrange to obtain the seedlings they require from that taluk.

As observed by the Collector, however, it is too early to attempt to form an estimate of the ultimate effect of the floods on the extent and the outturn of crops, and the probable amount of remissions that may have to be granted. A detailed report should, however, be submitted on the subject as soon as practicable.

9. From paragraph 27 of the Collector's report, the Board is glad to observe that the amount of Rs. 10,000 provisionally sanctioned for the relief of distress in Board's Proceedings, dated 25th August 1896, Mis. No. 4174, will be found to be in excess of requirements. It is stated that only Rs. 2,640–6–7 have been spent up to date, but that there are still some outstanding bills to be paid. The amount of these bills will not apparently be large.

10. In paragraphs 28 to 34, the Collector makes certain proposals based on the experience of the floods. These proposals are briefly—

(1) that a third Executive Engineer should be appointed for the Delta;

(2) that the flood-embankments of the river should be forthwith made up to an adequate height and section, whatever that may be decided to be, and that provision should be made for that standard being kept up throughout their whole length ;

(3) that a flood-embankment should be constructed on the right bank above the anicut ;

(4) that telegraphic connection should be established between Bezwada and the principal lines of canal;

The districts of Kistna and Gódávari are both exceedingly backward in telegraphic communications.

(5) that the number of ferry-boats on the canal should be increased ; and

(6) that all villages on the outer or river-side of the embankment should be moved to the inner or landward side of the canal. The Collector states that he will himself see to the last proposal being carried out. The other proposals will be communicated to the Chief Engineer for Irrigation for such consideration as he may deem fit to bestow thereon.

11. The attention of Government will be invited to paragraph 35 of the Collector's report in which he mentions the names of officers not specially referred to above, who have rendered commendable service during this trying time and an extract of that paragraph will be communicated to the Commissioner of Salt, Abkári and Separate Revenue.

12. The Collector says nothing about the lengthening of the railway bridge at Bezwada, and the Acting Commissioner has heard with regret that the verdict of Mr. Upcott was unfavourable to Major Baddeley's recommendations on the subject. The matter is one, in the opinion of the Board, to be considered chiefly from the standpoint of an Irrigation Engineer. Mr. Upcott was not present when the flood was at its height, and no one who had not seen it could form any idea of the damages caused by the present railway bridge and its embankment. After a river passes an anicut, or even a culvert, it should be able to expand like a fan. The railway bridge is actually narrower than the anicut, and, to save two or three spans, the Railway Engineer has built an embankment, which causes the river to cannon across from the left to the right bank, and back again, the result of which is that the banks below are imperilled throughout their whole length. Even if the irrigation system should have to be debited with the cost, the Board is of opinion that Major Baddeley's suggestions should be adopted. Were it not for the parapet walls built by Colonel Hasted after the floods of 1882, the head-works would have been carried away on the present occasion, and the present flood is by no means the maximum possible. Had it not been that the south-west monsoon has been a general failure in the East Coast districts, the recent flood would have topped and carried away the head sluices. This may happen in any year.

(True Copy and Extract.)

(Signed) R. V. SRINIVASIAR,
Secretary.

To the Secretary to Government, Revenue Department,
with one map.

" Collector of Kistna.
" Chief Engineer for Irrigation.
" Separate Revenue Department.
Copy to Land Revenue Department.

Exd. P. Seetharam.

REVENUE DEPARTMENT.

1896.

Board of Revenue

(Revenue Settlement, Land Records and Agriculture),

MADRAS.

Printed October 16th.

Proceedings, 5th Oct. 1896, No. 259.

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Floods in Kistna.—Submitting to Government report of the Collector, with the Board's observations, on the —

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16 3,000—14-7-94.

PROCEEDINGS OF THE MADRAS GOVERNMENT.

Read

copy attached

READ Proceedings of the Board of Revenue, Rev. Sett. &c., No. 259 dated 5th October 1896.

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ORDER thereon, No. 4395 Mis., d/ 7th Novr. 1896.

The foregoing report shows the damage caused by the recent floods in the Kistna District and the measures taken by the local officers to repair the damage and rescue the people in the flooded country. The Government notes with appreciation the valuable aid rendered by all the officers and by the private gentlemen referred to in the Collector's letter read above.

2. To prevent the recurrence of the difficulties experienced on the present occasion, the Collector makes several recommendations, of which a summary is given in para 10 of the Board's Proceedings. The Collector proposes himself to carry out the last proposal, viz., to move the villages on the river side of the embankment to the inner side. The other proposals have been communicated by the Board of Revenue to the Chief Engineer for Irrigation. The Public Works Department will be requested to communicate in due course the orders that may be passed thereon.

3. Orders will be passed in the Public Works Department on the question of lengthening the railway bridge at Bezwada referred to in para 12 of the Board's Proceedings.

4. Para 12 of the Collector's letter will be communicated

communicated to the Judicial Department for necessary action.

(True Extract)

Sd/- Lionel Davidson
12/4

Ag. Under Secretary to Government.

To the Board of Revenue, Rev. Sett.
" Judicial Department.
" Public Works Department.