A MEMORANDUM UPON THE
SUBJECT OF IRRIGATION FOR
THE RESIDENT - GENERAL
(SIR F. A. SWETTENHAM K. O. M. Q. J)
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IRRIGATION.

RESIDENT-GENERAL,

At the suggestion of Mr. Treacher you asked me a year ago to write a memorandum upon Irrigation. I have only now found time to do so.

I propose to begin by giving you a sketch of the history of Irrigation in Ceylon, because, in these newer countries of the Malay Peninsula, we cannot fail to learn a great deal by studying that history or to profit by applying the methods adopted in Ceylon to these States.

PART I.

1. Great mystery shrouds the origin of the vast network of tanks and canals with which Ceylon was at one time covered. They are said to have been constructed between B.C. 400 and A.D. 1,200.

2. Their ultimate object was to supply the village fields with water. Where springs existed, where a running stream was available, or where the rainfall of a district was not only abundant but regular, or better still, pretty evenly distributed throughout the year, it was sufficient to build a bund by which to impound the springs, to intercept the stream, or to store up the supply of rain or spring water. That was no doubt the origin of tanks.

3. But it was doubtless soon perceived that, in many cases, only a precarious supply of water was thus procured, and that more was necessary to render the irrigation and cultivation of the fields perfectly secure. Channels to lower tanks, ducts from larger catchment areas, and long canals, which were in themselves direct agents for the irrigation of fields below them, were constructed. In some parts of the country, where perennial streams abounded, a system of small canals afforded a better means of supplying fields with water than a system of tanks.

4. The village tank was, however, the most ordinary form of water storage, and, though there were important differences in the mode of using its supply and apportioning the fields under it, there was a general resemblance throughout the Island.

5. The Dutch(1) during the century and a half of their rule in Ceylon, did something for the improvement of the agriculture in the low lands of the Island.

6. Under British rule, in 1832, a Commission of Enquiry sat to restore the ancient irrigation works, but its efforts ended in failure, because, by its advice, it was enacted that no native or Indian subjects of Britain were liable to render any service in respect of the tenure of their land. This destruction of the communal machinery by which the tanks had been kept in repair was, of course, a fatal mistake.

(1) The Dutch, during the period of their rule in Malacca, paid much attention to irrigation.
7. In 1846 Sir Emerson Tennent revived the subject and another Committee was appointed. It called attention to the fact that the question of irrigation had long occupied the attention of the Government of India, with results pregnant with good: but its recommendations were set aside by the Secretary of State because he saw no reason why the policy of the Indian Government should be departed from: for he pointed out that in India public money had been habitually contributed to extensive works of irrigation and very rarely without a most ample return in direct augmentation of the land revenue, independent of those still more important indirect advantages which follow from the success of such works in diffusing general prosperity of which the Government eventually shared the benefit financially as well as generally. 

8. In 1852 my father (Mr. J. W. W. Birch) directed attention to the neglected state of the tanks and, during the remainder of his service in Ceylon, till 1870, constantly pressed on the Government the duty of pushing on irrigation.

9. In 1855 Sir Henry Ward, in his first address to the Council as Governor, proposed a vote of half a million of rupees (3) as a fund for irrigation purposes, and all the Government Agents were called on for reports.

10. On the 1st January, 1857, an Irrigation Ordinance was introduced. It was to remain in force for five years. It enabled the Government Agent of any Province to call together a meeting of the landowners of any district to determine whether the ancient laws and customs (4) with regard to irrigation should again be put into force: if it were agreed to enforce them, a Committee was to be appointed who were to draw up a collection of ancient customs with regard to irrigation and the cultivation of padi fields and the maintenance of the water rights of different proprietors. The rules thus drawn up were to be submitted to the Governor and, if approved, were to be binding on all the proprietors in the irrigation district. For a breach of the rules the Village Council was empowered to fine up to twenty rupees and no appeal was allowed against their decision.

11. This Ordinance was but partially brought into operation. It was not successful, because it provided only for certain sections of the Island where there were large tracts of padi land dependent on a single source of irrigation, with a comparatively large number of proprietors whose interests were identical.

(2) The principle of Government sharing the benefit, derived from works on which public money is expended, is sound and is thoroughly understood by the people of these States. See also the views of Sir Hercules Robinson—para, 29.

(3) I invite special attention to the liberal expenditure of money recorded here and also in paras. 22, 25 and 28.

(4) It is remarkable how insistent the authorities in Ceylon were upon the question of observing all ancient customs in these matters. See particularly Sir Arthur Gordon's address to Council, para 30. This will be the keynote of success, if we are to succeed. The padi-planting rules which have been in force in Perak for some time and are now worked in Pahang and the Negri Sembilan are successful, when enforced, merely because they are an integral part of Malay land tenure. No well-ordered household or well-disciplined Regiment could have more cheerfully obeyed and more completely carried out the instructions of their chief than was the case with the people of the Negri Sembilan in respect of the Padi Rules of 1867.
12. A brilliant exception to that want of success was presented in the district of Batticaloa, and it is recorded that the result there was "due to the energy and ability of Mr. Birch, whose name is now held in grateful remembrance by the inhabitants of the district as that of the man to whom the enormous extension of cultivation in the district, and the position it now holds of being the chief rice exporting district in the Island, is mainly due."

13. The Ordinance was renewed for a further period of five years by the Ordinance of 1861: of its new provisions the most important was the appointment of an Irrigation headman.

14. When the Ordinance of 1861 had run its full time it became apparent that both Ordinances, though in a measure successful, had not done all the good that was hoped and expected of them, and Sir Hercules Robinson having become Governor, a Committee of six members of the Council were appointed in November, 1866, "to receive evidence and report on the existence of localities in the Island, where public money or private capital might be expended on irrigation or any other works likely to tend to an increased production of the food of the people."

15. One Assistant Government Agent gave as reasons for the partial failure of the Ordinances—

(i.) That they did not confer compulsory power on the officials who superintended the working of the law;

(ii.) That they did not provide the revenue officers and headmen with funds to meet any charges to which they might be put in consequence of the neglect of any proprietor.

16. Another Assistant Government Agent wrote: "I believe that the cause which has tended to lessen the production of padi in this district has been imperfect irrigation. Improve the system of irrigation: lessen the chances of failure or make them remote. Give permanent irrigation, and you restore confidence at once. While the careful cultivator will soon learn the immense advantages he possesses under such a system, the careless husbandman will be stimulated into activity and frugality. Under such a system the improvement must be rapid, and the stimulus given to cultivation generally immediately perceptible."

17. The answers of all, whose opinions were invited, agreed in urging the necessity of irrigation in general, and the obligation of the Government to organise a scheme for the restoration of tanks and other irrigation works.

18. The deliberations of the Committee were embodied in forty-two resolutions from which I call the following:—

(i.) That irrespective of abandonment, at various periods, of vast tracts of cultivated fields in several Provinces, the productiveness of padi land in Ceylon has for many years being steadily on the decrease, notwithstanding the use of manure in some districts.

(5) Inasmuch as the success of planting operations depends upon their being simultaneously carried out and admits of no delay in order to refer to higher officials of Government, it is imperative to give to the Penghulus or Headmen, who enforce the orders that have been issued, power to compel compliance with them. There is no fear of injustice, for Government officers are too accessible, and natives too ready to complain, to allow of despotic action.
(ii.) That this decrease is caused mainly by the uncertainty of the
seasons and irregular and deficient water supply.

(iii.) That there are large bodies of water running in waste to the
sea, (6) which, if stored in tanks, might be the means of extending
existing cultivation and of rendering harvests far less precarious
than at present.

(ix.) That, notwithstanding the increase in the value of padi rents
caused by the rise in the market value of grain, the Government loses
large sums yearly by deficient crops.

(xi.) That irrigation works may be classed under three heads:—

(a) Tanks and water courses of magnitude;

(b) District irrigation works capable of repair, and situated in
or contiguous to populous neighbourhoods;

(c) Village tanks, dams and water-courses.

(xiv.) That many of these admit of repair at an outlay realisable
in increased production as well as in the value of Crown land, which
would be sold in consequence within a reasonable period.

(xv.) That owing to the general poverty and the want of combi-
amination and necessary skill amongst the rural population, they are, with
rare exceptions, unable to undertake the repair of such works.

(xvi.) That without skilled European supervision such repairs
cannot be successfully undertaken. (7)

(xvii.) That the people, where they exist in sufficient numbers, are
willing to contribute in certain proportions to the repair of such
district works. (8)

(xviii.) That it is most desirable, under all these circumstances,
that Government should undertake the repair of such irrigation works
as promise to extend existing cultivation or to render its results less
uncertain.

(xxii.) That by the extension of existing cultivation and the en-
couragement of new, the condition of large numbers of the people (9)
may be materially improved and the Island rendered less dependent on
foreign supplies than is now the case.

(xxiv.) That the retention and circulation in the Island of large
sums now paid away for imported rice (10) will aid the general revenue
of the country by aiding the consumption of other taxable articles.

(6) This waste in the Federated Malay States is most deplorable and
is easy of remedy.

(7) The capabilities of Malays as Irrigation Engineers are admitted by
all members of the Public Works Department who have taken the trouble to
examine their methods. Their dams, irrigation and drainage canals and
aqueducts, and above all their skill in raising water by the use of wheels, are a
common theme for admiration. They can almost make water run up-hill, but
they fail absolutely in those larger works which from stability of construction
resist the pressure of flood waters or hold back only so much as is required.

(8) Not only are the people willing to help, but customary law compels
them to give their assistance, which may be rendered by personal service or by
labour paid for by themselves. To enact such provisions by law would be no
innovation to Malays and would be quite intelligible to natives of other races
who settle in Malay countries.

(9) See my para. 50.

(10)
(xxxv.) That in all cases, whether of repairs, restoration or construction of irrigation works, where the expenses and skilled labour exceed £100, the entire work be undertaken by Government, but that a water-rate be levied on every acre of land irrigated by such works. Should the cultivators, however, be willing to undertake any portion of the earthwork, they may be allowed to do so, and charged a water-rate reduced in proportion to the work executed by them. (11)

(xxxxviii.) That the upkeep and repair for all works for irrigation, from which a water-rate is levied, be at the expense of Government. (12)

(xl.) That, in order to meet extraordinary emergencies, a sum of money be advanced annually; (13) such sum to be accounted for annually and recovered.

19. Simultaneously with the presentation of the report of this Committee, the Irrigation Ordinance of 1867 was introduced. The leading features of the measure were:

(a) The issue of invitations for the people to meet and decide whether their district should be formed into an irrigation district and whether they desired the Ordinance to be carried out by means of Village Councils, or headmen, or both.

(b) The nomination of a Committee to collect together the ancient customs of the district and to embody them in the shape of rules.

(c) In case of breach of the rules the summoning of the Village Council, and the trial of the person accused of such breach: the fine, in case of conviction, not to exceed £2.

(d) The compensation of the person injured, or the repair of the injuries, from such fines. (14)

(e) The duty of the headman to repair the damage and recover the costs from the offending party as if it were a fine. (14)

(f) Provision for the payment of irrigation headmen and for the construction as well as repair of village tanks and minor works.

20. In December, 1867, Sir Hercules Robinson, who had adopted Mr. Birch as his chief adviser, gave his views on the report of the Committee that had led to this Bill. He laid down that Govern-

(11) It will be difficult, if not impossible, to enter into calculations of this kind. Water-rate should be charged for all works on which Government money is spent, and the Irrigation Board should decide what works require skilled labour. To fix a money-limit will be impossible.

(12) This is but fair. Our policy should be to levy a perpetual rate and to efficiently keep up the works, all earth-work being performed by the people.

(13) Without an Irrigation Fund to which recourse can be had without delay for all money to be paid away, there can be no successful organisation. See also para. 15 (ii.)

(14) These two points may be taken together. One of the best provisions of our padi rules is that damage caused to the land of one proprietor by the neglect of another shall be assessed by the Penghulu and recovered from the offender. From such decision and from the infliction of fines by Penghulus there should be no appeal.
ment could only undertake works where the persons benefited declared themselves ready to repay the cost of construction. It was right that a paternal Government should supply capital and skilled labour for the construction of works which the unorganised condition of the inhabitants made it impossible to undertake themselves: it was equally just that those benefited should eventually pay for the benefits they enjoyed. If the additional value of the lands irrigated was not greater than the outlay, the scheme was a bad one, and had better be abandoned; if it was greater, there was no hardship in asking for repayment. The Governor proposed that the capital paid by the Government should be repaid by ten annual instalments, without asking for the payment of any interest.

21. There was opposition and a division in Council on this point, but the Governor's clause was carried and the Bill was passed on the 31st of December, 1867.

22. By 1870 the success of the Irrigation Ordinance had become manifest and the great utility of irrigation had already been recognised. During the six years of his Government Sir Hercules spent over a million of rupees on irrigation.

23. In 1872 Sir William Gregory became Governor. After six months' experience he said in a speech in Council: "Upon the subject of irrigation I am enabled to offer you the most unreserved congratulation. In the month of April I visited the rice-growing regions of the Eastern Province (Batticaloa), which are the creation of the irrigation works carried out by Government. I never before saw such an unbroken sheet of grain; save where some isolated trees broke the view, the eye wandered over some 20,000 acres of green padi. I saw wherever I went a sleek, vigorous, well-fed and thoroughly healthy population. The great impetus to padi cultivation was given in 1857" (see my para. 12 ante). "Up to 1864 the lands under cultivation were 54,000 acres; in 1871 they were 77,000 acres."

24. An Ordinance to amend the "Paddy Cultivation Ordinance of 1867," was introduced in October, 1873. The amending Ordinance was rendered necessary by the success, not as heretofore by the failure, of the previous Ordinance. So great indeed had been the success of the measure that it was hoped that in the course of years, as the amounts of the investments in irrigation works accumulated, a return would be obtained which would contribute materially to the expenses of Government, and might ultimately afford a sensible relief to the people from the burden of taxation.

25. Under it forty four works had been completed or were in progress at a gross cost of Rs. 1,200,000 (17) irrigating about 100,000 acres.

26. The chief provisions of the new Ordinance were:

(a) A permission to the cultivators to pay the Government in kind instead of money:

(15) See note to para. 7 ante.
(16) See note to para. 9 ante.
(17) See note to para. 9 ante. It is to be noticed here that the cost of these works was only Rs. 12 per acre. The fact will be worthy of recollection hereafter.
(b) A permission (entirely optional) to substitute a payment in perpetuity (18) for the present system of repayment, by ten annual instalments, of the cost of the work by which their lands had been benefited; the maximum charge for irrigation being one rupee, subject to reduction if the payment of one rupee exceeded 7½ per cent. on the money expended on the irrigation work: the Government to make itself responsible at this rate for the upkeep of the works.

The Bill received but little criticism and was passed.

27. In 1874 Sir William Gregory had occasion to find fault with the system under which certain irrigation works had been set on foot. He issued strict orders that the most careful preliminary plans should be undertaken before an estimate was presented to Government. (19) The Council, in reply, assured the Governor that, as a reliable and regular supply for the cultivation of padi was in their opinion necessary for the existence of the bulk of the rural population, they would readily sanction whatever judicious expenditure might be required for the purpose. They trusted, however, that past experience would enable the Government to undertake future works on a safer basis.

28. During the five years of his tenure of Government, Sir William Gregory spent close upon a million and a quarter of rupees upon irrigation. (20)

29. For the next ten years there is little to record: the law was not amended and, except where a policy of retrenchment checked the expenditure, steady progress in irrigation was made.

30. In December, 1883, Sir Arthur Gordon succeeded to the Governorship of Ceylon, and, in his opening address to the Council in 1884, set forth his irrigation policy (21) and the grounds for its adoption:

(18) This paragraph is full of teaching for us: the water-rate should be perpetual: should be $1 per acre except where large storage tanks are constructed or works of magnitude undertaken, when a charge of $2 per acre could be levied: no work should be undertaken which will not pay 7½ per cent: if any charge exceeding $1 per acre exceeds that rate of interest it should be reduced to such sum as will yield 7½ per cent: but the minimum water-rate should be $1 per acre.

(19) See also paras. 32 and 36 (c) (ii.) Nothing goes more to the root of irrigation work than the preparation of careful estimates. If the work is not remunerative the scheme is bad and had better be abandoned. If money is asked for to be spent on a small padi area and will not yield 7½ per cent, the people should be advised to move to some other irrigation area. No scheme should be considered until plans, estimates and reports are furnished by the Land Office, the Survey Department and the Public Works Department. It will not of course be necessary to show that 75 acres will pay water-rate in the first year of completion of a work costing $1,000: but it will be necessary to show that 75 acres, suitable for the growth of rice, will be irrigated and that there is a reasonable prospect of all the land being taken up. It may safely be assumed that all land properly irrigated will be occupied at no distant date.

(20) See note to para. 9 ante.

(21) I commend Sir Arthur Gordon’s speech and message to Council (para. 31) for careful perusal. When there was doubt as to the starting of the Krian Irrigation scheme I urged the raising of a loan. I now again urge the importance of spending money without stint, without postponement. To make the future of our railways assured there must be people to use them, and next to railways and roads there is no more legitimate way of spending public money.
"Since the beginning of the year," he said, "I have visited many different parts of the Island. In the course of my journeys I have become forcibly impressed with the absolute necessity for more extended and systematic action on the part of the Government in aid of the irrigation system of the Island.

"It is, I think, impossible to overrate the importance of this work, or to neglect it without a criminal disregard of the obligations which are imposed on us by our position in Ceylon.

"Sir Henry Ward, Sir Hercules Robinson, Sir William Gregory, have all recognised these facts, and have all made efforts to convert that recognition into practical action; but the money which they had hoped to keep steadily applied to irrigation works has been diverted to objects, not really of more importance,—for that is impossible,—but which appeared to be of more immediate pressing urgency. I am not hopeful of my own success where my predecessors have failed, but there are some circumstances which encourage me to persevere.

"First among these is the increasing magnitude of the evil produced in many parts of the country by the failure of the water-supply, and the necessity of grappling with it at once, if it is to be grappled with at all. We have now the neglect and the shortsightedness of a century to repair. Eight and twenty years ago, when Sir Henry Ward first took up the question, there was far less to be done.

"Secondly, I think the obligation of the Crown towards the people in this respect is now far more generally understood than used to be the case. It is a double obligation, partly founded on the fact that by the receipt of tithe or rent paid to it the Crown acknowledges its interest in the irrigation of land, partly on the fact that to our well-intentioned but perverse and mistaken interference with traditional duties and customs the ruin of not a few of the village tanks and irrigation canals, which were in use fifty years ago, is attributable.

"Thirdly, the wonderful change effected in a village which has received an abundant water-supply is now to be seen in many places, and affords such an argument as cannot be controverted for the continuation of works of this nature.

"Success or failure in this work depends mainly on our support, nor can I deem it necessary to point out to intelligent men the advantage to all classes, as well as to those immediately benefited, which must result for the improvement of the health, the food, the dwellings of the mass of the population.

"I propose that ultimately a considerable sum of money, to be raised by loan, should be devoted to this work, and that its administration should, subject to the sanction of the Governor, be vested in Commissioners, who would be powerless to divert the funds entrusted to them to other objects. No such loan could at present be raised, nor are we at present sufficiently prepared to apply it if available, but I shall ask you for a vote which will enable me to cause a systematic survey to be made, not of detached works here and there, but of the watersheds and irrigation capacity of whole districts. I believe that it will be found that by a proper application of the resources of science an enormous waste of water might easily be avoided."

31. And again, in a financial message to Council the same year:—
"There is no expenditure," wrote the Governor, "more absolutely