CHAPTER – 5

IMPACT OF NEGLECT OF IRRIGATION
Irrigation Development and the Role of British Military Engineers:

During the early British regime, all irrigation works were the responsibility of military engineers of the Engineer Corps of the East India Company Armies, under the overall charge of a Military Board. These engineer officers only occasionally went to the war front and, when the fighting ceased, most of them returned to continue their civil work. Some of the notable army engineers were Arthur Cotton, John Colvin, Proby T. Cautley and S.L. Jacob and they did splendid work in building some of the most important and magnificent canal systems in British India. As it was thought the training received in carrying out large railway or irrigation works by the Royal Engineers would make them efficient with an army in the field.¹

The defects of this system were the financing to large irrigation works form the yearly revenues. This was soon rectified and it was decided that only public works of a non-remunerative character, such as those relating to the creation and maintenance of civil and military buildings, the construction and maintenance of roads and other such works were to be charged against yearly revenues. The works aimed at promoting the prosperity of the country, such as railways, canals and harbors, were to be constructed from borrowed funds and treated as commercial undertakings and for such works separate capital and revenue accounts were to be maintained.²

² Ibid.
**Sir Arthur Cotton - The Most Illustrious Irrigation Engineer:**

General Arthur Cotton, whose dedicated work among odds had turned millions of acres of dry barren lands into flourishing farm lands. He can be rightly termed as the most illustrious Irrigation Engineer British India had known. He arrived in Madras in September 1821 as a young man of just eighteen and was attached to the office of the Chief Engineer of the Presidency. In 1822 he was sent as an Assistant to the Superintending Engineer of Tank Department in the Southern Division Capt. Fullerton. His responsibility was to repair and maintain the tank in Coimbatore, Madurai, Tiruchirappalli, Thanjavur and Tirunelveli districts. He was made lieutenant in 1824 and was in charge of the military buildings in St. Thomas Mount. He was deputed to serve in the first Burmese War.

In 1826 Arthur came back as Superintending Engineer, Central Division of Tank Department and was also in charge of Pamban Pass work. Later he was promoted as captain and made in charge of Cauvery Irrigation and Pamban Pass work. In 1830 he constructed the scouring sluices in the Grand Anaicut and had to leave for England on sick leave. He came back and resumed charge in 1832 when he planned the Upper and Lower Kollidam anaicuts.³

This old stone anaicut fascinated Arthur Cotton. He called it "GRAND ANAICUT". He probed how this engineering feat was achieved. He designed and constructed 5 scouring sluices on the eastern end of the anaicut. While excavating for the foundation, he was surprised to see that the *Kallanai* had stood all along on foundations laid with large boulders embedded in the layer of stiff clay underlying the

³ A. MohanaKrishnan, *Selected Papers on Irrigation*, p. 121.
sandy bed. Sir Arthur Cotton constructed the Dowleeswaram anaicut across Godavari with Grand anaicut as model.4

During the 1840s, government in view of stable agricultural income began to patronize irrigation work. An enthusiastic Englishman proclaimed in 1843 that “as long as one drop of water is allowed to run waste into the sea, we must take blame unto ourselves for not exerting our best efforts to obviate the evils of poverty or the dreadful effects of famine.” Yet until 1868, almost all government funding supported what were called “repairs.” Collectors and Tahsildar ‘parceled out funds to contractors to shore up a tank wall, rebuild a broken channel, or patch a crumbling dam.’5

The success of the Jumna Canals in Northern India at last prompted the revenue administrators to attempt the improvement of the Kollidam Works in the South. From 1836 the work was regularly and vigorously prosecuted. The lands irrigated from the Kollidam and Cauvery increased from 6,30,000 acres to 7,16,000 acres; and the land revenue was increased by Rs.44,000 per annum, giving a return of over 24% on the outlay.6

4 P. Gomathinayagam, “Taming the Rivers of Tamilnadu (From Sangam Age to 20th Century)”, Water Resources: Development and Management in India through the Ages, pp. 112-113.
5 David Ludden, Peasant History in South India, p. 142.
Setting up of the P.W.D. in 1854:

The Military Board was abolished in 1854 and the Public Works Department was created in its place. There was a dearth of civil engineers in the country, and hence the burden of carrying out civil engineering works fell on the military engineers, who were deputed to the P.W.D. on a permanent basis. In 1866, the P.W.D. was split into three branches; a Military Works Branch, a Civil Works Branch including irrigation projects and a Railway Branch.\(^7\)

Private Enterprise Steps in:

From the point of view of financial returns efforts at contribution of irrigation work in the country was a great success. Arthur Cotton successfully executed large irrigation projects like the Cauvery Delta System, the Godavari Delta System and the Krishna Delta System of canals under his supervision and guidance. All these and canal irrigation projects constructed in Northern India, such as the Western and Eastern Yamuna Canals, the Ganga Canal and the Bari Doab Canal, proved to be financially quite viable.

In view of the rich return from the investment in irrigation projects private entrepreneurs entered the field of irrigation under the "guarantee system" provided by the Government of India. Under this system, the Government of India guaranteed a return of 5% on the money invested. The imperial Government was unwilling to finance large irrigation schemes which required huge capital outlay from its revenues. The principle of financing productive irrigation projects from loans

\(^7\) G. Venkatraman, P. Aruthamuthu, (Editor), *Administration and Financing of Irrigation Works in India 1800-1950*, p. 66.
raised in the market, for the purpose, had not yet been introduced. The government under the crown, therefore, decided in 1858, to permit private enterprise to participate in the expansion of irrigation network in the country under the “guarantee system.”

**Private Enterprise – A Failure:**

The two irrigation companies floated in England viz., the East India Irrigation and Canal Company and the Madras Irrigation Company floated in 1858 and in 1863 respectively miserably failed to execute irrigation projects. The Government of British India had to take over the two irrigation companies and put an end to the concept of private enterprise in irrigation works.

**Famines in Colonial Tamilnadu:**

Famine has been defined as “a state of extreme hunger suffered by the population of a region as a result of the failure of the accustomed food supply”. This description of the calamity is valid only under primitive and mediaeval conditions of economic life. Due to lack of means of transport and absence of well-established channels of trade, man under those conditions had to subsist on food raised either by himself or by others in his immediate neighborhood. The people of a region, in the event of a local failure of crops, cannot look to other parts of the country, much less beyond their national frontiers, to make up the deficiency in their current food supply. India has suffered from famines since time immemorial. Though

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8 Ibid., p. 67.
9 Ibid., p. 68.
a connected and complete account of all the famines that occurred in the pre-British period of Indian history is lacking, the available evidence suggests that in the earlier times a major famine occurred once in every 50 years.  

Irrigation development in the British period had mostly taken place as a measure of famine relief. After taking over the administration of Madras presidency, the East India Company became concerned about the dwindling land revenue and attempted to take measures to improve the irrigation sources in order to enhance the Company’s resources. Adding to the unsatisfactory irrigation facilities, droughts and famines were periodically breaking out leading to food deficit in the Madras presidency. So the East India Company had to import rice, wheat and other food grains and pulses from outside Madras. The imports were heavy during droughts and famines from the years 1806-1807 and 1807-1808, 1812-1813 and 1823-1824 and 1825-1826. During the ten years between 1833-1834 and 1843-1844 the total value of paddy and rice imported into the Madras presidency from Burma was Rs.1,08,14,248, of which Rs.62,43,540 (nearly 58%) was the share of the six northern districts of the Presidency. The Reports of the Indian Famine Commissions, published in 1880 and in 1898, reveal tragic stories of the people during famines. Scarcities apart, there were eighteen major famines between 1770 and 1878.

Besides food deficit, famines often caused irreparable damage to the economy of the presidency. It led to the setting up of a series of famine commissions.

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11 Ibid., p. 510.
12 Challa Ramachandran, *East India Company and South Indian Economy*, p. 79.
13 B. Natarajan, *Food and Agriculture in Madras State* (Madras, 1953), pp. 2-5.
14 Brahma Nand, *Famines in Colonial India*, p. 158.
The first Famine Commission setup in 1878 suggested certain measures on which the famine codes were promulgated from 1883 onward.15

**Famine of 1782:**

The first serious famine took place during 1781 - 1782. The Government of Madras responded by abolishing all import duties on grain and called upon the officers concerned in other British colonies or other provinces to forward all available grain to the Madras presidency. On 20th May they appointed a Grain Committee to superintend the daily distribution of grain. The famine of 1804 affected Thanjavur and South Arcot districts. The Collector of Thanjavur district recommended an embargo on export of rice, from Bengal and the Northern districts.16

Thomas Munro when he later became Governor of Madras, he sanctioned the proposals made by himself for the reduction of assessment in the Ceded Districts and granted reliefs in other districts too. These measures, though helped to avoid further distress did not improve the condition of the poor peasants.17

Thomas Munro however as Collector of Ceded Districts had alerted the Board of Revenue on the subject of the impending scarcity, and strongly deprecated any government interference, by importing on government account. He has recorded the net result of this famine in his district: "Nearly half the ryots had emigrated, most of

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the headmen were reduced to poverty, and many of them had been sent to jail. The substantial ryots, whose stock supported the agriculture of the villages, were gone.”

Madras Famine of 1807:

The early attempts to assess lands in Madras were ruinous, and when there was a widespread failure of rains in 1806, it was followed by a severe famine. Large crowds of emaciated people flocked into the town of Madras, attracted either by the existence of a charitable association, or by the hope of obtaining gratuitous help on compassionate grounds. The Government at first decided against any interference with private trade, but in the end they thought it necessary to purchase grain, guaranteeing a minimum price to importers. The number of deaths from this famine is not known. It was during the early part of this famine that Thomas Munro wrote in favour of employing labour, but against gratuitous relief. “The Natives of India are probably as charitable as those of any other country, and the poor may be left to their care… I see no cause to apprehend a famine in the Ceded Districts. I cannot discover that such an event has ever happened in any former period, unless when war was added to an unfavorable season.”

Famine of 1811:

The season of the year 1811, was unfavorable in some southern districts, and early in 1812, the Board of Revenue addressed Government on the impending distress. The Board deprecated any importation of grain on government

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18 Ibid., p. 27.
19 Brahma Nand, Famines in Colonial India, p. 160.
account. The Government, on the Board’s recommendation, exempted from duty all grain imported from abroad, and transferred them from one district to another.\textsuperscript{20}

**Madras Famine of 1823:**

A new system of land-settlements, called Ryotwari, was introduced first in Madras and then in Bombay. The system was one of settlements, not with landlords or zamindars as in Bengal, but with individual cultivators or ryots. There was a famine in Madras in 1823, and a severe scarcity in Bombay in the following year. Mount Stuart Elphinstone, Governor of Bombay, declined after some discussion, to interfere with private trade. In Madras an incentive was offered on grain imported to the use of distressed locality. The mortality is unknown.\textsuperscript{21}

**Famine of 1824:**

In 1824 and 1833 famines of most serious in nature affected the district of Nellore, Masulipattinam, Guntur and southern districts. This time rice was imported into the Madras Presidency from Burma.\textsuperscript{22}

In 1824 the Board of Revenue authorized the large scale employment of people in the ceded districts and in Guntur, Salem, Vizagapatnam, North and South Arcot, Madras and Nellore. The proposal of the Collector of Nellore to pay them in grain was negative by the Board. The recipients of relief were divided into two

\textsuperscript{20} S. Singarajan Articles, p. 19.
\textsuperscript{21} Brahma Nand, *Famines in Colonial India*, p. 161.
\textsuperscript{22} B. Natarajan, *Food and Agriculture in Madras State*, p. 5.
categories, those who were able to work and those unable to do so. Each was given a token entitling him to a sufficient quantum of cooked food to preserve life.\textsuperscript{23}

**Famine in 1833:**

After an interval of 9 years, the most serious famine of Madras which affected the Northern districts of Nellore, Masulipatnam, Guntur, Rajamundry, Bellary and Cuddapah broke out. The Government appears to have been taken by surprise, and the severity of the calamity was not recognized till too late. Very little was done to relieve distress, except by the distribution of gratuitous food in the towns to which the sufferers flocked. It was estimated that 2,00,000 persons died in Guntur out of a population of 5,00,000. People died in the streets of Madras. In Nellore “the roads were strewn with dead bodies.”\textsuperscript{24} “R.C. Dutt lamenting on the fate of Indian peasantry during famine years, pointed out that, “famines in India are directly due to deficiency in the annual rainfall; but the intensity of such famines and the loss of lives caused by them are largely due to the chronic poverty of the people”.\textsuperscript{25}

**Madras Famine of 1854:**

A famine visited the northern part of the Madras Presidency and parts of Hyderabad in 1853. Relief was administered only by public works, and for about nine months over fifty thousand people obtained relief on these works. The mortality

\textsuperscript{23} S. Singarajan Articles, p. 21.

\textsuperscript{24} Brahma Nand, *Famines in Colonial India*, p. 161.

\textsuperscript{25} Romesh Dutt, *The Economic History of India, Vol.I*, p.34.
from this famine is not known, but the census taken in 1856-1857 showed that the
growth of the population had declined.\textsuperscript{26}

Munro did not agree initially to the concept of famine. He argued that
there was no real famine due to the failure of monsoons in the ceded districts. The
failure of monsoons caused only scarcity but not famine. It was only the
mismanagement of the native government that caused famine. Later Munro accepted
that truly ceded districts were prone to famines due to unfavorable geographical
conditions in which they were situated in.\textsuperscript{27}

John Thomas, a long time Madras Civil Servant observed “that the
Indian trader was in a position to supply the needs of the numbers stricken in any
given famine. He maintained that only government had the machinery and energy to
supply grain on the level required during the famine.”\textsuperscript{28}

This opinion was reiterated by Dalyell, the investigator of Madras Famine. Commenting on the proposal of Relief Committee of Famine in 1866, he
pointed out the necessity of keeping the existing irrigation works in thorough repair.
He attributed famines to the neglect of a large number of irrigation works, which were
bequeathed to the British government by their native predecessors.\textsuperscript{29}

\textsuperscript{26} Brahma Nand, \textit{Famines in Colonial India}, p. 162.
\textsuperscript{27} Y. Alfred Sudhakar Reddy, \textit{Agrarian Relations in the Ceded Districts of Madras
\textsuperscript{28} Elizabeth Manak, \textit{Formulation of Agricultural Policy in Imperial India 1872-1929},
Ph.D. Dissertation submitted to the University of Hawaii, 1979, pp. 20 – 21.
\textsuperscript{29} S. Singarajan Articles, p. 21.
In Indian context, farmers confronted overflow of waters or flooding because of breach of tanks, which monsoon turned out to be heavy. Floods in Tamiraparani, occurred in the years 1810, 1827, 1847. With the exception of the flood of 1847, all these visitations occurred during the period of the North-East Monsoon.

Owing to extraordinary high freshes, the Cauvery and Kollidam burst their banks and flooded the whole region. In consequence of the disputes that they had with the Government on prices, the peasants had left large quantities of their grain stacked in the fields, and the result was that the damage caused by the flood was greater than it would have been in an ordinary year, and large quantities of grain were destroyed. G.F. Travers the Collector of Tiruchirappalli had observed “the country was covered with water as far as the eye could reach, and that even high-lying fields were submerged. The Uyyakondan channel burst in several places, and it was only with the greatest difficulty that it was repaired.”

On 6th December, 1810, rain lashed for 30 hours. On the following night Tamiraparani river-valley was inundated with the loss of many lives. More than a thousand houses were swept away. 500 houses were destroyed in Alwartirunagari alone. Most of the main channels, many large tanks, including the large tank of Srivaikuntam, were breached and for miles the river-valley was an unbroken sea of water.

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In 1827 owing to heavy downpour, tanks and watercourses fed by Tamiraparani were almost destroyed. Many villages were under water for several days and as the water receded, the roofs were seen in lines upon the banks of slime which had once composed the walls of the houses. The Assistant Engineer, who was at the time in Srivaikuntam, which remained marooned for three days, in the gopuram of the local temple.

**Tank Maintenance and Construction:**

Early in the 19th century when British had acquired considerable parts of South India, little was done to restore and preserve the numerous reservoirs and tanks constructed for irrigation by old native rules and chiefs of South India. When ryotwari system was introduced in the Madras Presidency in 1820 AD, the responsibility of irrigating land under ryotwari fell solely on the shoulders of the Government. The ryotwari system placed the Government in the position of all irrigation works, except a few works in Thanjavur and Tiruchrappalli districts, landlords and also laid more obligations on them to promote works of irrigation were in a bad shape. The tanks lacking inadequate sluices and proper *calingulahs* were considered unfit for storage purposes. The supply channels to the tanks had become choked up and so were the irrigation channels. When Arthur Cotton visited South Arcot in 1826, large number of mirasidars represented the ruinous state of irrigation works pointing out that the fields, which were once paddy land, were covered with jungles. Arthur Cotton himself recorded the deterioration of all irrigation tanks.\(^{31}\)

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Governor of Fort St. George thus declared in 1799: it is the wish of the Government to leave the construction and care of tanks and watercourses entirely to the proprietors, who will however, to encourage improvement be assisted with loans from the Treasury. This policy was followed consistently and for long. If tanks were occasionally repaired, it was at the expense of the, or renter who had to place an annual deposit with the Company. A work of great benefit to the people, but considered expensive for any single individual, was undertaken by the Government; but the first consideration was to see that the assessment was apportioned “so as to indemnify the Company as far as may be practicable, for the expenditure to be thereby incurred”. At one time Munro suggested that "the repair of tanks not rendered private property should be made by Government”, but the proposal was evidently not accepted. 32

Decline of Kudimaramath:

In the late 18th and early 19th centuries, three different land tenures were prevalent in the Madras Presidency, viz. Permanent Lease, Ryotwari Settlement, and village Tenure. Under both Permanent Lease and Village Tenure, tenants were expected to maintain irrigation sources, the government having no control over them. But the Ryotwari tenure which was a settlement between individual ryots and the state, gradually paved the way for the disintegration of community control over land and other resources. With ryotwari tenure, common property resources like tanks vested with the government. With the introduction of the ryotwari tenure in 1822, the government considerably expanded the civil engineering department, and in 1825

brought it under the Board of Revenue. A new post of the Superintendent of *Maramath* under the control of district Collector was created in the 1840s for each district. The superintendent had to examine the work done and at times execute large and important works. Both the civil engineering and the revenue departments thus had hardly any establishment to maintain the large number of tanks in the presidency. Whatever establishment existed it concentrated on the maintenance of canals, which yielded much more revenue than the tanks. After 1850 colonial officials became increasingly aware of the status of irrigation sources in the Madras Presidency. The elaborate procedures required for the *Ryotwari* Settlement paved the way for the listing of tanks and preparation of detailed accounts of Tanks by the 1880s.\(^{33}\)

**Irrigation and Colonial Administration:**

The creation of channels and any major repairs of both channels and tanks were always regarded as part of government responsibility. There was no Public Works Department prior to 1850. Irrigation was looked after by Civil Engineering Department under the Board of Revenue. The Collectors had to report to the Board of Revenue as to what works required repair, with an estimate of the expenditure. Minor repairs were looked after by the local authorities, while the major ones were entrusted to the Superintendent of Tank Repairs and Watercourses.\(^{34}\)

Any major investment in channel works and tank irrigation was negligible in comparison with the land revenue earned from the wet areas. Indeed, except the Upper and Lower Kolli dam Anaicuts in the late 1830s, benefiting parts of

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Thanjavur and South Arcot, all public investments were small-scale temporary repair works. The inadequacy of the government expenditure on irrigation was due to several factors. First, the policy of irrigation was based on profit. As a result the sanction of any project by the Board of Revenue depended on how quickly the money would be returned with profits. In spite of the great need of tank irrigation in the Pattukottai taluks of Thanjavur district, and in spite of the fact that the money needed was small, about one-fifth of the revenue annually yielded by these lands, it was not attended to. Again, in spite of the adverse comment on the inefficient state of the irrigation works in Tiruchirappalli in the 1840s by the then Civil Engineer, the Collector ignored it. He defended his rejection of the view of the Engineer on the ground that there had been already an annual investment equal to 7% of the annual revenue of the wet lands of the district and there was no need for further increase.  

Secondly, as a result of the above policy, even the generally inadequate expenditure was limited to a few traditionally, richly irrigated areas. In all those areas where wet cultivation was fairly extensive, further extension of the existing irrigation facilities was eagerly utilized, thus ensuring government investment in terms of increased land revenue and additional taxes on water. In parts of Thanjavur, for example, extensive repairs and improvements in the form or sluices etc. were undertaken several times, beginning since 1821-1822. In the same year, in the lower taluks of Salem (Namakkal and Paramathi), traditionally enjoying considerable channel irrigation, a large sum was sanctioned for the repair and enlargement of their principal channels. Similarly, despite some delay extensive channel work was executed in Chidambaram, South Arcot.  

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Thirdly, in dry regions the government negligence in repair works was very obvious. In North Arcot, where the repair of tanks was entirely the government's responsibility, it was neglected to such an extent that the number of tanks in good condition drastically declined and that nothing was done, despite the appeals of the farmers to the tahsildar, the Collector and the Board of Revenue to get them attended to. Here the change of attitude came around the middle of the 1840s, when the famous Cauverypak tank was repaired by spending Rs.47,000.37

In 1809 the duty of superintendence was divided between two Civil Engineers and in 1819, their number was raised to three. They toured the various districts, examined the reservoirs and channels and effected major repairs where ever necessary.38 However the money allocated for the expenditure on irrigation works was totally inadequate. It has been stated that "large sums" were spent on account of irrigation but these "large sums" really amounted to a few thousand rupees per annum for districts yielding some lakhs of revenue each, According to the computation of the Public Works Commissioners of 1852, the charge incurred for repairs was less than 1/2% on the probable original cost of the works, under 2% of their total annual yield and little more than 4% on the revenue derived from them.39 Even from such expenditure, the best results were not always obtained.

For a long time the supervision of repairs was entrusted to people who had no knowledge of engineering, and the works naturally suffered. There was also a

37 Ibid., p. 54.
39 Ibid., p.123.
great deal of wasteful expenditure. Even when experts were recruited, they were so few and their responsibilities so vast that they were simply not able to manage the affairs. It was not till 1838 that the Maramath Department, as it was called, was reorganized. The whole Presidency was divided into eight maramath divisions with a civil engineer at the head of each. They worked with great zeal, and the improvements they effected invariably proved most beneficial, both to the government and the cultivator, but little could be done in a decade. Hence the condition of irrigation works at the close of the mid 19th century was still far from satisfactory. 40

40 Ibid.