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**CAPITAL, ‘DEVELOPMENT’
AND CANAL IRRIGATION
IN COLONIAL INDIA**

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Abstract

The method employed in this study of the nature of imperial purpose in India sought to compare the principles against the practice of British rule in relation to 'development' through public works such as canal irrigation. It is argued that economic policy was based on the need to generate wealth in ways that did little to disrupt the social and political order, but instead use the state to source and secure tribute rather than development.

Introduction

At the peak of railway construction in the late nineteenth century nationalists had questioned their benefit to India. Few then or since, however, have taken issue with the notion that canal irrigation was anything but an unalloyed boon. The British, of course, were far from reticent in highlighting canals as not just one of the blessings of their rule but, indeed, something which justified it. In 1865 Richard Strachey wrote that as a remedy for famine, canal irrigation was the one thing the British Government was bound to do for the people of India 'by all the laws of good government, of civilization, and of humanity...' (Government of India 1867, p.49). In a letter to the editor of *The Times* of December 28 1876, Monier Williams, Professor of Sanskrit at Oxford University, declared that irrigation would force 'even haters of the English rule to admit that no other Raj has conferred such benefits on India' (*The Times*, January 23 1877). In December 1877, free trade campaigner John Bright and canal-builder Arthur Cotton addressed a meeting of merchants and manufacturers in Manchester and asserted that canals were 'necessary for the development of Indian resources, and for the welfare of the people of that country' (*John Bull*, 15 December, 1877). In 1881 Ripon, the

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Viceroy of India, stressed Britain's moral responsibility to bring improvement to India through the application of western technology. Constructing public works such as canals and railways to prevent famine was 'a test of whether it is or is not beneficial to the people of the country'. He went on, 'If with all our power and all our knowledge, and all our science we cannot preserve them from dying of starvation by hundreds of thousands every few years, how can we justify our domination over them?' (Ripon, 1881). The British made clear and consistent efforts to use canal irrigation to explain and justify their rule in India. Canals offer an opportunity, then, to understand the nature of imperial purpose. In order to properly assess the impact of British rule on India we need to understand what they were doing there in the first place.

Capital and British imperial purpose in India

British Imperialism by PJ Cain and AG Hopkins represents the most explicit statement on the driving forces underlying British empire-building (Cain and Hopkins, 1993). The authors argue that from the late seventeenth century an alliance between the landed aristocracy and city financiers - what they refer to as 'gentlemanly capitalism' - came to dominate economic and political life at home and abroad. The needs and priorities of this elite determined imperial decision-making which resulted in India becoming a target for long-term capital investment. In the 'gentlemanly capitalism' thesis, colonial governments followed simple guidelines. The territories they administered must have the ability to make payments on the capital invested in them. The function of the Raj, then, was limited to ensuring India's financial solvency. This was to be sustained by efficient revenue extraction and the maintenance of an export surplus which would enable repayments to London (Cain and Hopkins 1993, p. 319). Not surprisingly, the notion that British imperialism can be reduced to a single cause has come under attack. One critic has described it as 'excessively moncausal' (Cannadine 1995, p. 194). Another has argued that the

'economic explanation' is blind to divisions and contradictions within the administration between 'traditionalists' who wanted to preserve Indian society from corrupting and destabilising western influences and 'modernists' who wanted to transform Indian society and promote economic development (Kumar, 1996, p. 731). Yet, the authors of the 'gentlemanly capitalism' thesis do in fact attempt to incorporate such influences into their explanation. They argue, indeed, that hand-in-hand with the needs of capital went a developmental programme underscored by political and moral principle.

[The] impulses drawing Britain overseas merged economic consideration with a wider programme of development that aimed at raising the standard of civilisation as well as the standard of living, and was accompanied, accordingly, by exports of liberal political principles and missionary enterprise (Cain and Hopkins 1993, p. 468).

Whilst stating this, however, they also acknowledge the limited success of this developmental drive. Beyond British declarations lay a 'sub-continent that had been affected but not transformed by a century of British rule' (Cain and Hopkins 1993, p. 327).

When we examine efforts at 'improvement' through the construction of public works such as canals, the reasons for the limited impact of British rule on India's economic development become clear. Much of the explanation centres on the nature of the ruling elite - the alliance between the landed interest and City finance - that dominated Britain and in whose interests India and the empire would be run. The key to understanding this grouping lies in its aversion to industrial manufacturing. Neither at home nor abroad did the City of London invest in industry (Jenks, 1971, pp. 15 and 77). Anti-industrialism has its origins in the dominance of the landed interest in Britain's ruling oligarchy. This elite sought to preserve its position by pursuing wealth creation

in ways that entailed minimal disruption to the traditional social and political order on which its privileges rested. It strove to maintain the values of a rural, hierarchical, pre-industrial Britain associated with the landed aristocracy. Industrialisation underscored the dangers entailed in other forms of wealth creation. The social consequences of industrialisation were followed by political ones. In bringing together large numbers of people in towns and cities industrialisation set in place the conditions for the more rapid development of citizenship than was possible in a pre-industrial Britain. Drawing tribute in the form of rent at home and investment abroad was not only more profitable it entailed limited social and political upheaval in Britain. The most effective way of generating wealth in this non-disruptive way was to use the state to source and secure tribute. This political strategy for preserving privilege, developed in eighteenth-century Britain, would later be extended abroad.

In the eighteenth century the British state was effectively tuned into a market for capital. The 'City' emerged out of the establishment of the national debt to service the wars of successive monarchs and continued to grow in this way throughout the eighteenth century (Jenks 1971, pp. 10 and 16-18). The national debt became a profitable investment for bankers, merchants and landowners who lived in London and the south-east of England (Cain and Hopkins 1993 p. 66). A parliament dominated by the landed interest gradually shifted the tax burden away from the gentlemanly capitalist elite and onto the mass of the people through the extension of indirect customs and excises which disproportionately impacted on poorer taxpayers (Jenks 1971 pp. 17-18). In the immediate aftermath of the Napoleonic Wars in 1815 the national debt was consuming nearly 80 per cent of public revenue in repayments to the City of London (Cain and Hopkins 1993 p. 79). A shift to lower taxes was made when overseas governments offered alternative sources for investment (Jenks 1971 p. 23). Between 1815 and 1830, £50m of British capital was invested

in stable continental governments (Jenks 1971, p. 64). American states and municipalities played a similar role and by 1836 \$90 million, mostly from the UK, had been invested in public works such as canals and railways in the US (Jenks 1971 p. 72). From the 1850s the strategy of using governments to source and secure capital was extended to India and the rest of the empire.

In India, the British had no interest in developing a sector of the economy that they were doing so much to control and marginalise at home. Beyond what was necessary to achieve a favourable balance of payments, there was no serious attempt to develop manufacturing. British economic policy in India was designed to draw tribute whilst minimising social and political change. In order to sustain tribute, the administration worked to maintain a trade surplus of exports over imports. The Raj had remarkable consistency in doing this. Except for the Great Rebellion years India maintained an export surplus in all years following the loss of the East India Company's monopoly of trade in 1833 (Government of India, 1880, p. 94). Exports were principally opium, cotton, and grains together with jute, hides, indigo and tea (Government of India 1880, p. 96). The aversion to industrial manufacturing ensured that India's main exports were raw agricultural materials rather than manufactures. In 1878-9 only 6.5 per cent of total exports were manufactured goods (Government of India 1880, p. 98). When the Famine Commission sought to promote alternative employment it did so with industries that would ensure that India remained firmly in an agricultural state. These industries were associated with India's primary exports: sugar refining; leather tanning; the manufacture of cotton, wool and silk; tobacco; the manufacture of paper, pottery, glass, soap, oils, and candles (Government of India, 1880, pp. 175-6).

In the decade 1869-1879 when state constructed railways began, India's export surplus averaged roughly £16m per year. This

was repatriated as the Home Charges – roughly half as returns on capital investment and the rest as administrative costs (Government of India, 1880, p. 94). The nature and extent of the sums flowing back to the UK had been the subject of politically charged debates even before the publication R. C. Dutt's *Economic History of India* in 1904 (Dutt, 1904). Later scholars have sought to define the drain as the 'unproductive' element in the 'home charges' and also exclude public debt as well as civil and military costs (Macpherson, 1972, p. 156). Others have questioned this distinction between the two categories and point out that budgetary practice sought to disguise the extent of 'unproductive' debt by adding it to the productive account (Sen, 2003, p. 110). Cain and Hopkins do not dwell on the nuances of productive and unproductive drain. 'India's role', they state simply, 'was to be that of a tributary province' (Cain and Hopkins 1993, p. 321). The British Raj functioned to source and stabilise the transmission of tribute from India to Britain. This was principally achieved through the promotion of public works such as canals and railways as these 'productive' works came to account for the bulk of the Home Charges. In the process the Indian public debt rose from £30m in 1837 to £220m by 1900 (Charlesworth, 1982, p. 53). Loan financed public works, mainly canal irrigation and the railways, represented a significant part of what the Raj did in India as revenue figures indicate. In 1878-79 total gross revenue stood at just over £65m. Land revenue accounted for the greatest single contribution at £22.5m, opium accounted for £9m and salt at just under £7m. Receipts from 'productive public works' accounted for as much as salt at nearly £7m and more than the combined total of customs and excise at £2m and £2.5m respectively (Government of India, 1880, p. 90). Canals and railways were not built to modernise India's economy. Development was merely rhetoric to legitimise actions taken purely in the interests of capital.

Table 1: Revenue of British India, 1878-79

Land Revenue	£22.5m
Taxation	
Excise	£2.5m
Stamps (Judicial and Commercial)	£3m
Customs	£2m
Salt	£7m
Assessed Taxes	£1m
Court and Registration fees	£0.25m
Provincial Rates	£2.5m
Total taxation	£18m
Receipts other than taxation	
Sale of opium	£9m
Productive public works	7m
Post Office	1m
Other	7m
Grand Total	65m

Source: *Indian Famine Commission*, p. 90. (Figures have been rounded)

Capital's shift to India in the 1850s came in the wake of financial failures in the United States and growing competition for the City on continental Europe (Jenks, 1971, pp. 103-4 and 196). More renowned for his efforts at reform and 'improvement', Governor-General Dalhousie (1848-56) did much in this period to make India safe for British capital. First he set about expanding the revenue base to enable India to meet its external financial obligations. Beginning with Punjab in 1849 and finally Awadh in 1856, Dalhousie's administration witnessed one of the largest and most determined periods of territorial annexation since the early decades of British expansion. With these various territorial

acquisitions Dalhousie calculated he had added roughly £4m to the revenue of India (Government of India, 1856, p. 7-9). Behind Dalhousie's rhetoric of reform and modernisation lay the determined drive for revenue and markets for British capital. As he expanded the revenue base of the Raj with territorial acquisitions, Dalhousie began the task of financial and administrative reform designed to make India fit for capital. Dalhousie's aim was to attract capital from the City of London by giving it the security it demanded. The maintenance and repair of public works was to be financed out of the ordinary revenue. Canal building, railways and harbours, on the other hand, would be financed by loans from the City. This was to be undertaken primarily through the development of 'public works' closely supervised by the Indian government. In 1854 he abolished the Military Boards which had hitherto carried out public works. Instead a Central Public Works Secretariat was established in Calcutta to oversee them (Government of India, 1879, p. iv). Each local government would exercise control over public works through a chief engineer and by the time Dalhousie left these changes had been given effect in the Presidencies of Bengal, Madras and Bombay (Government of India, 1856, p. 35-36). Expenditure on canals before the establishment of the Public Works Department had been comparatively small (Government of India, 1879, p. vi). Up to 1850 total expenditure excluding civil and military buildings only averaged £250,000. By 1854, even excluding railways constructed on guaranteed loans, public works construction stood at £2 million a year (Strachey and Strachey, 1986, p. 86-7). Following Dalhousie, the Raj emerged more clearly than before as an institution that functioned almost exclusively to generate markets for British capital and deliver the necessary security for these investments.

With the shift to direct government following the abolition of the East India Company in 1858, the prospect of India as a market for

British capital was given great publicity at home (Whitcombe, 1971, p. 63). In October 1858, in an article titled 'Why is Not British Capital More Largely Invested in India?', the *Economist* pronounced on India's favourable conditions (*Economist*, 9 October 1858, p. 1121). It drew attention to the more favourable prospects of 'investing capital in mines, railways, canals, steam-boats, or manufactures.' It was now clear that 'opportunities for profitable investment must increase to an incalculable extent' (*Economist*, 9 October 1858, p. 1121). In 1860 the British government sent James Wilson, editor and founder of the *Economist*, as the first Finance Member in the Viceroy's Council. Wilson's task was financial reform designed to safeguard India's solvency and prepare her for capital investment. Once greater security and legitimacy was achieved, investment in India increased. In addition to railways and canals, large amounts of money were directly invested in commerce, services and plantations. Between 1865 and 1914 roughly £286m was raised on the London stock market for India. This figure represented 18 per cent of the total placed in the empire as a whole. India stood second only to Canada as a recipient of British investment (Cain and Hopkins 1993, p. 338). Public works, principally canals and railways, were the main targets of this investment. Mining, plantations and even the railways were portrayed by many contemporaries as proof of the exploitative nature of British rule. Canals on the other hand were seen, even by nationalists, as evidence of British improvement. If canal irrigation symbolises British rule at its best, it represents a good opportunity to see just what it was the British were doing in India.

Canals and capital in nineteenth-century India

Elizabeth Whitcombe studied the effects of canal irrigation on agriculture in the Ganges-Jumna Doab – the stretch of land between the two rivers in present day Uttar Pradesh (UP) running south of Delhi and beyond Kanpur. Whitcombe took a less positive view than British administrators. She catalogued a whole series of detrimental

effects brought about by canals as ecological and economic disruption followed in their wake. Canals brought waterlogging and greater salinity, soil exhaustion due to over-cropping, an increase in famine by the displacement of the food staples of the poor and raising the incidence of malaria (Whitcombe, 1971, pp. 72, 75-6, 81-2). Ian Stone, in contrast, questions Whitcombe's severe judgement. Against the negative effects of canals must be set the fact that the western districts of the United Provinces, 'especially the heavily irrigated northern districts enjoyed a degree of broadly based material prosperity matched by few areas in India'. Stone cites the support for canal irrigation given by Indian nationalists and the authority of the Famine Commission's Report of 1880 which recommended the extension of irrigation as a means of famine prevention (Stone, 1984, p. 4). Only an understanding of the nature of the British imperial purpose can place canal irrigation and other 'development' projects in their proper perspective.

In the beginning, canal irrigation was spurred on by the search for revenue. Early British efforts began in 1817 and centred on the redevelopment of older Mughal works (Government of India, 1862, p. 99). One of these early constructions, the East Jumna Canal, was opened in 1830 and showed how remunerative canal irrigation could be yielding 23 per cent on the capital invested in it (Whitcombe, 1971, p. 64). Canal engineers were quite candid about their motives in these early days. Commenting in 1849 on the redevelopment of Mughal canals, Proby Cautley, builder of the Ganges Canal, acknowledged that had they not promised an increase in the revenue they would never have been built (Cautley, 1849, p. 80). The search for revenue and the provision of markets for capital was behind the annexation of Punjab in 1849. In April 1848, just over a year before annexation, a survey of the prospects of canal irrigation in the Punjab was undertaken. Colonel Richard Baird Smith, (1818-61) formulated a plan to apply all the waters of Punjab to irrigate 8m acres of land. Cautley commented that 'there can be

little doubt that the completion of the series of works suggested would render the Punjab one of the most profitable acquisitions ever made by the British Government'. An investment of £600,000 in these works would enable Punjab to yield £4m to the revenues of India, it was claimed (Cautley, 1849, p. 141-2). Canal irrigation was begun in Punjab soon after annexation (Government of India, 1856, p. 26).

Canals were built for the financial returns they promised but progress remained slow in the first half of the nineteenth century. Dalhousie's efforts, however, had help set in place the right conditions for greater capital investment. First, restrictions on the East India Company borrowing in the City of London were eased (*Economist*, 9 January 1858, p. 29). Capital of £2m was to be raised annually for irrigation, but Dalhousie's retirement, the events of 1857 and the need to construct military barracks led to the postponement of this plan (Government of India, 1867, p 68; Government of India, 1879, p. vi). In the meantime, other means were tried to attract the capital necessary for larger-scale investment. Between 1854 and 1867 private companies were engaged to build irrigation works (Government of India, 1879, p. vii). One of the key figures in post-Rebellion canal irrigation by private companies was Sir Arthur Cotton. He devised an ambitious scheme to build a canal network across the Indian peninsula from Madras in the east to Mangalore in the West using the waters of the River Krishna (Deakin, 1893, p. 264). The first section of the scheme to be sanctioned was a canal from the Tungabhadra River – the Karnul canal (Deakin, 1893, p. 266). So eager was the government in the pursuit of capital's interests that little thought was given to the usefulness or viability of the projects concerned. Lord Stanley, the Secretary of State, permitted Cotton's scheme to proceed without challenging any of his estimates or examining its feasibility (Deakin, 1893, p. 265). In 1858 the Madras Irrigation Company was formed with a government guarantee of 5 per cent on a £1m capital outlay (Government of India, 1879, p. vi). The result was a disaster for all concerned except the London financiers

and their investors. In 1866, three years after it had been sanctioned, the capital had been spent with the works only partially completed. The government offered to buy out the failed company but shareholders refused (Deakin, 1893, p. 266). By 1881 the scheme had lost £1,240,000 and was running at an absolute loss. In July 1882 having paid out 5 per cent on the guaranteed £1m loan and an additional £670,000 the government bought out the company's scheme for £2,164,000 (Deakin, 1893, p. 268).

Alfred Deakin, an Australian politician, who saw the works in the early 1890s, wrote 'The causes of this utter and lamentable failure are not at all difficult to decipher...' First the nature of the soil was such that irrigation was not needed to grow crops (Deakin, 1893, p. 268). Even the Famine Commission pointed out that the canal 'flows for much of its course through a country in which the usual food grain grows perfectly well in ordinary years without irrigation' (Government of India, 1880, p. 162). Deakin noted that there was 'never likely to be any notable return from navigation'. He pointed out its main flaw in this respect '...the Canal runs from nowhere, to nowhere in particular and consequently there is nothing and nobody to carry' (Deakin, 1893, p. 268). Given all of this Deakin argued that even if the works had been properly and cheaply built they would have failed - 'They were not wanted, they are not wanted, and it is doubtful if they ever will be wanted.' In a further comment he remarked:

The extraordinary oversight which led to the unhesitating construction of these great works, without regard to the character of the soil to be watered... or the results to be obtained by its execution, is a remarkable incident in the history of Indian irrigation (Deakin, 1893, p. 267-8).

Unfortunately, there was nothing remarkable or extraordinary about this venture in canal irrigation. Another of Cotton's projects in eastern

India was to irrigate the delta region of the Mahanadi and Brahmani rivers in a canal network that would extend from Cuttack to Calcutta. Carried out by the East India (Orissa) Irrigation and Canal Company, the scheme also overran original estimates costing £6m (Stone, 1984, p. 22-3). In the end the failing company was bought out by government (Strachey and Strachey, 1986, p. 90; Government of India, 1879, p. vi). Local requirements were not taken into consideration in building these works. In the low alluvial lands in the Orissa section there was already enough moisture as to make irrigation unnecessary if not harmful to the land (Dacosta, 1877, pp. 31-2). In the Midnapore section, on the other hand, there was not enough water to go round in a bad year (Government of India, 1878, p. 245). The Sone Canal in Bihar had been constructed in 1879. Here too there was little demand for canal water. In a petition to the government the Maharaja of Dumraon, whose estate the Sone passed through, complained that the villagers had deserted because they were unable to pay the water-rates. Now he, as zamindar (landlord), would have to pay the returns and '...suffer for the extravagance of a speculative Company and the inconsiderate generosity of a Government that entered into a one-sided engagement, the ruinous obligations of which are now to be transferred to your unfortunate Memorialists' (Dacosta, 1877, pp. 33-34).

Building canals in areas already adequately irrigated and bypassing arid zones was fairly typical of British irrigation policy. The Bari Doab Canal in Punjab was built in already fertile land (Stokes, 1980, p. 67). In the UP Doab the British did not turn desert-like terrain into fertile land through canal irrigation. The area was already widely cultivated and had good irrigation from wells and tanks (Whitcombe, 1971, p. 67). Dry zones in need of irrigation were left untouched whilst productive land already irrigated by wells became the target of canal development. Administrators were often perplexed about the

government's irrigation policy. In the late 1870s the Director of Agriculture pointed out that the one fourth of the Upper Doab irrigated by the Ganges and Jumna Canals 'was less in want of canals than the three-fourths which they do not irrigate' (Stone, 1984, p. 73). Another administrator commented: – 'canal water has been wasted in fertile neighbourhoods which do not require it, while close by there are still arid tracts' (Stone, 1984, p. 74). Canals were built as markets for capital investment and areas not in need of additional irrigation were developed for the production of water-demanding crops like sugarcane, indigo and rice. In terms of development, having canals bypass dry unproductive land to well-irrigated productive land made little sense. It made perfect sense in terms of capital, however. Building canals in the more productive areas meant that they were more likely to pay their way and make returns on investment. Safeguarding the interests of capital was the goal of the government. From the mid-1860s loan-funded canal building was brought into government hands. To secure capital a British empire so closely associated with liberal free-market *laissez-faire* ideology adopted a policy of state control of the economy more reminiscent of twentieth century socialism or fascism than the era of free trade.

Private capital and state control of canal construction

Laissez faire is one of the economic principles most closely associated with nineteenth-century British imperialism. Like all the principles which were supposed to underpin British rule, *laissez faire* was no more than rhetoric for legitimising government actions. Sabyasachi Bhattacharya has argued that the British attitude to *laissez faire* in India was at best 'pragmatic' (Bhattacharya, 1965, p. 1-22). With an annual expenditure of £1-2m from 1867 all irrigation works were taken out of the hands of private companies and into the hands of the government public works department (Government of India, 1879, p. vii). The aim of state control was clear and there was little doubt, according to Strachey,

of 'Irrigation Works properly designed, executed, and managed, proving highly remunerative as an investment of capital' (Government of India, 1867, p. 48). The move to state construction was not undertaken due to the failures of private companies. Financial difficulties in the post-Rebellion years had temporarily caused the departure from what had always been a government undertaking. Before 1857 the construction of major works such as the Ganges and Bari Doab canals had been financed through loans (Government of India , 1867, p. 34). In 1864 it was decided that 'the State should undertake directly all the irrigation works that it can practically manage, in preference to entrusting them to private companies' (Government of India, 1879, p. iii). Richard Strachey was asked to draft a report justifying state construction of canals. The aim of Strachey's report of 1867 was twofold: first to show that loans were the only way the construction of canals could be pursued on a large scale and, secondly, that the government, not private companies, should undertake the work. Strachey made the case for loans by first showing that the annual surplus revenue available for public works would be insufficient. He compiled a list of possible irrigation requirements in Punjab, the United Provinces, the Central Provinces, the Presidencies of Bengal, Madras and Bombay and argued that a conservative estimate of £29m would be needed to meet future irrigation requirements in the following ten to fifteen years. With, at best, an annual grant from the revenue of £500,000, about £20m would need to be raised through loans (Strachey and Strachey, 1986, p. 89.). To manage the probable outlay of £30m Strachey became first Inspector General of Irrigation Works in 1867 (Government of India, 1867, p. 73). Over the next decade £15 m was sanctioned in a programme which included the Agra Canal, the Lower Ganges Canal in UP, the Sirhind Canal in the Punjab and the Mutha Canal in the Bombay Presidency (Stone, 1984, p. 23-4).

The relative progress of canal and railway building brings out the extent to which it was the needs of capital rather than Indian

welfare or ‘development’ that determined their construction. In the wake of the return to state construction of canal irrigation by loans, Richard Strachey drafted a proposal in 1869 that the principle be extended to the railways. The following year Viceroy Mayo ended the system of railway construction by the 5 per cent guarantee and state construction financed by loans began (Strachey and Strachey, 1986, p. 90-1). By 1875 the boom in loan financed and state constructed canal irrigation was over. By the end of the decade, the financing of railway construction was greatly outstripping canal building (Stone, 1984, p. 23-4). This was not due to the difficulties in making remittances to London brought on by the declining value of the silver-based rupee against sterling. Nor was it due to the fact that the railway lobby was more powerful and successful in claiming available funds. The state of Indian finances with rising expenditure, almost static revenue and the resort to loans to pay interest on the public debt gave rise to anxiety about India’s eventual bankruptcy and calls for financial reform. Much of this debt was due to public works, especially canal irrigation. Though investors were safeguarded by guaranteed interest, Indian canals were not paying for themselves even under state management (Dacosta, 1877, pp. 9-10, 15). The Government’s finance and revenue accounts for 1875-76 showed that losses on all the irrigation works constructed by the British Government up to 31st March 1876 were £3,497,187 (Dacosta, 1877, p. 29). However, in the same period despite financial worries and the declining value of silver, investment in railways continued. Canal irrigation was proving to be a much less secure and remunerative and therefore a much less attractive prospect for British capital. Failure to meet capital’s needs, not government principles determined public works policy. Investment in railways increased while spending on canals declined. By 1880-81 the amount spent on canals stood at £12,500,000 (Stone, 1984, p. 25). The total outlay on state railways up to the end of 1880-81 was £26,689,000 (Strachey and Strachey, 1986, p. 90).

Renewed efforts were made to make investment in canal irrigation more secure. The government continued to pursue canal irrigation, first because in themselves they provided investment opportunities for capital. In addition, they also had several positive follow on effects that would promote the interests of capital. It was hoped that in the longer term water-rent would expand and give greater flexibility to the revenue base (Government of India, 1867, p. 13-14). Canals would also help railways to finance themselves by giving ‘a powerful stimulus to the traffic on the railways’ as well as extend markets (Government of India, 1867, p. 31). From the beginning, Dalhousie had linked railways to promotion of exports. ‘In the first instance’, he wrote in 1854, ‘a system of trunk lines should be formed, connecting the interior of each Presidency with its principal port’ and then connecting the Presidencies with each other (Government of India, 1856, p. 16). Before becoming Governor-General of India, Dalhousie had campaigned for railway construction in Britain where his concern had been that railways should have sufficient traffic on them to pay their way (Jenks, 1971, p. 212). The acquisition of Awadh brought with it the principal forests which supplied much of the timber to northern India (Government of India, 1856, pp. 4-5, 7, 9, 16 and 25). Later, the railways would ‘give free outlet to the surplus of the rich province of Oude [Awadh]’ (Government of India, 1862, p. 105). Linking rail lines to areas rich in raw materials was done not to serve the needs of British manufacturing but to provide railways with business in the transport of goods so that they met the interest on the loans raised to build them. According to Richard Strachey, the increase ‘in the amount of exportable produce, that must follow on the extension of Irrigation Works, cannot fail to produce a very marked effect on the profitable character of the traffic of the railways’ (Government of India, 1867, p. 37). Together canal irrigation and the railways served the interests of capital by providing markets, and by facilitating exports they helped the Raj meet its external financial obligations.

In the beginning the authorities had tried to argue that canals were financially successful. When this became clearly indefensible revenue figures were massaged to make canals appear remunerative. The Budget statement of 1879-80 showed a net revenue of £964,600 on an expenditure of £11,252,356 on irrigation. This figure, however, was achieved by including 'indirect' revenue from irrigation works (Probyn, 1880, p. 9-10). In addition to this, greater pressure was put on the extraction of water-rates and measures included arrest and the confiscation of property (Dacosta, 1877, p. 23). Irrigation cesses were introduced so that 'all lands irrigable by the canal water would pay the water charge, whether they used it or not' (Dacosta, 1877, p. 32). Finally, when canal irrigation could not be justified on any other grounds the government claimed they were essential as a famine preventive measure. Famine prevention became the main reason for canal building in government rhetoric.

Legitimising canal irrigation and securing capital: Famine prevention in theory and practice.

Canal irrigation declined in the 1870s due to anxiety over its security as a market for British capital. It would only revive again when financial conditions improved. The government had a two-pronged approach to make investment more attractive: First, moral legitimacy was imparted to public works policy and second, more rigorous measures were put in place to make them financially viable. Famine prevention increasingly became the emblematic reason for investment in canal building, while greater financial rigour worked to safeguard it. In 1866 the Secretary of State, decided that:

In determining which projects to select for survey and detailed estimate, it is desirable that two main objects should be kept in view. The first is to select those works first for execution which are calculated to prevent the occurrence or mitigate

the severity of drought and famine; the second is that the works should be remunerative. No project should be selected which is not likely to satisfy both these considerations (Government of India, 1870, p. 3).

In practice this meant that the second condition always determined policy. Government could always argue that an irrigation project was preventing famine, but no project would be considered that could not pay its way. Canals were more likely to pay their way in lands that were already productive rather than in famine-prone dry areas. Strachey put it more explicitly the following year, 'the essential point to regard is that the works shall be remunerative, which in brief implies that they will be profitable to the State' (Government of India, 1867, p. 40).

Two parliamentary bodies were established to achieve the dual goal of legitimising policy and securing capital. The first of these was the 'Select Committee on Expediency of constructing in India Public Works with Money raised on Loan, and Prevention of Famine, 1878-79'. The Committee admitted the financial failure of canal irrigation, but government was determined to pursue its programme of canal building by improving financial safeguards. Despite the fact that 'considerable sums have been wasted and certain profitless schemes undertaken', it was determined that 'the policy of continuing to borrow for productive public works, may, within the limits and restrictions hereinafter laid down, be continued (Government of India, 1879, p. xvii). Henceforth a stricter definition of what was 'remunerative' was to be enforced. The Select Committee recommended that 'the construction of new works from borrowed money for the future be limited to those schemes alone which, upon the responsibility of the Government are estimated to be productive, by yielding an annual income equal to the interest on the capital expended in their construction, including, in such capital, interest during construction.' (Government of India, 1879, p. xxi) The aim was

to reduce the extent to which unprofitable irrigation schemes had to be supplemented with payments from the general revenue. If such payments decreased and receipts from canal irrigation increased, 'confidence will be established in the productiveness of these works' (Government of India, 1879, p. xxii).

The name of the second parliamentary body established to promote capital investment in canals has caused confusion both among contemporaries and subsequent scholars about its actual purpose. The name of this body is the Indian Famine Commission (Government of India, 1880). To ensure that proper focus remained constant the government appointed the former canal engineer and first Inspector-General of Irrigation in India, Richard Strachey, as President of the Indian Famine Commission. Not surprisingly the Commission determined that of all the ways in which protection from famine could be achieved, 'the first place must unquestionably be assigned to works of irrigation' (Government of India, 1880, p. 150). Areas where canal irrigation could be extended were recommended and their financial prospects examined. The Commission argued that one of the main causes for the financial failure of canal irrigation was the reluctance of cultivators to take up new methods of cultivation (Government of India, 1880, p. 152). The way to make canals pay was to produce profitable commercial crops such as sugarcane, indigo or rice that utilised large amounts of water. This had been known from the early days of canal building. The report on the 1860-61 famine in northern India was also carried out by a former canal engineer and Superintendent of Irrigation, Col. Richard Baird Smith. His priorities had been equally clear. In the Rohilkhand area of the United Provinces 'the natural conditions of moisture of climate and subsoil' placed it above the need for artificial irrigation. Nevertheless, he argued that the area could be developed to promote water-demanding crops such as rice and sugarcane (Government of India, 1862, p. 97). So steadily did Strachey, his fellow canal engineer, maintain

focus on the productive issue that at times he lost sight of the importance of the moral case for canal-building as protective works. In the Bombay Presidency staple food grains could be raised without irrigation and ryots saw no need for canals. Strachey saw a way, not to prevent famine, but to promote 'the success of the canal system':

What is really necessary to the success of the canal system is that it should displace the cheapest and most easily-grown grains, and replace them by crops which, though more valuable, yet require more outlay of capital and labour...

(Government of India, 1862, p. 159).

The Famine Commission's priorities were revealed in its determination to promote export and water-demanding crops over staple food grains consumed by the poor.

If there is any doubt about why canal irrigation was pursued in India we only have to look at how they worked in terms of famine prevention in practice. Over the decades in which canal construction was carried out, India was ravaged by several severe famines. Some of the worst ones were as follows. In 1860-61 famine mainly in UP, Punjab and Rajasthan, left 2 million dead. In the 1866-67 famine in Orissa, Bihar and South India about 1 million were killed. Between 1876 and 1878 five and a half million died in famines affecting UP, south and western India. In 1896-97 over 5 million died in famines affecting the UP, Delhi, Bengal and central India (Visaria and Visaria, 1983, p. 529). By the government's own figures between 1860 and 1900 roughly 20 million Indians died from famine. The government claimed that canals would help un-irrigated areas by increasing the yield of food crops and therefore prevent scarcity. But even areas directly irrigated by canal waters were not immune from famine. Baird Smith's Report on the Famine of 1860-61 in UP showed that the Ganges canal failed to prevent famine. Canals depended on a steady water supply and

successive seasons of drought led to the near exhaustion of the river on which the canal depended (Government of India, 1862, p.87-88). The Ganges Canal did not bring immunity from famine in UP as the famines in the Doab in 1860 and 1869 testified (Dacosta, 1877, p. 21). In Orissa in 1866-67 canal irrigation could not prevent famine (Visaria and Visaria, 1983, p. 528-31). A combination of famine and disease meant that India's population growth rate slowed considerably in the decades in which the British were engaged in India's 'improvement'. At its worst point between 1911 and 1921 the total population of India rose only by one million from 298 to 299 million.

Table 2: The population of India 1871-1931

Year	All India Population (Millions)
1871	250
1881	254
1891	276
1901	280
1911	298
1921	299
1931	332

Source: Visaria and Visaria, 'Population (1757-1947)', p. 490.

Not only did canals fail to prevent famine there is considerable evidence to suggest that they made things worse for those social groups most susceptible to food scarcity. Whitcombe's verdict for the Doab is that 'generally speaking canal irrigation did, and could do, little to decrease the ravages of scarcity by expanding the sources of staple food supply,

indeed, its effect tended to be the reverse, to contract them'. This tendency increased when wheat cultivation was given stimulus by the export trade from the late 1870s (Whitcombe, 1971, p. 75). The staple food of the majority of the population in northern India came from the *kharif* millets such as *jowar* and *bajra* and the coarse *rabi* grams. None of these required or even benefited from the extensive irrigation that canals provided. Those crops that did were commercial ones such as cotton, indigo, tobacco, and sugarcane (Whitcombe, 1971, p. 31). As export crops they also contributed to the maintenance of India's necessary balance of trade surplus. This had other negative effects on the food supply. According to one commentator, the railways by facilitating export, 'materially lessened the local stores of grain, and have rendered the people more dependent than formerly on external aid during seasons of pressure' (Probyn, 1880, p. 19). By stimulating the production of commercial export crops the area given over to staple foods diminished as a result of canal irrigation. Canal irrigation was geared towards the needs of commercial crops which increased revenue through water-rates for the large amounts of water needed to grow them and were valuable enough to pay these (Whitcombe, 1971, p. 31). Ostensibly concerned with famine prevention the Famine Commission sang the praises of such developments:

From the Punjab in the north to Tinnevelly at the southern extremity of the peninsula, wherever irrigation is practised, such results are manifest; and we may see rice, sugar-cane, or wheat taking the place of millets or barley... (Government of India, 1880, p. 96).

Dalhousie had claimed at the end of his administration that canal irrigation would, in itself, be sufficient to define his administration (Government of India, 1856, p. 26). In an important way canal irrigation does symbolise British rule in India. Government rhetoric about famine prevention

sounds extremely hollow when set against not only the high priority given to financial viability, but their actual record in mitigating scarcity. Often failing in terms of irrigation, navigation, as well as financially the government needed to justify its canal policy. When they could not be justified on any other grounds, increased stress was put on famine prevention as an explanation for policy. Canal irrigation was carried out in India to provide markets for British capital and policy was dictated by the need to secure the necessary revenue to pay the remittances on these loans. The overriding determinant on where canals were built was whether they could yield sufficient revenue to meet the interest charges on the capital loaned to construct them. Canal development in dry zones may have made sense in terms of development but it did not make sense in terms of capital investment. By building canals in the most productive regions and promoting water-demanding commercial crops, the British sought to secure returns on their investment. Rhetoric about 'good government', improvement or development was merely meant to obscure less elevated motives. Canals do stand in testimony to British rule in India, but not in the sense that is often ascribed to them.

Conclusion

This paper examined the nature of imperial purpose in India. It did so by measuring the ideas that were supposed to underpin policy against actual practice. In attempting to explain British rule in India historians should give less attention to official pronouncements about motivation and principle than to what actually happened on the ground. Economic imperatives not political principles determined British policy in India. Like Britain, India was ruled in the interests of an elite that sought to generate wealth in ways that brought minimum disruption to the social and political order on which its privileges rested. Both in India and in Britain this took the form of sourcing tribute, first in the form of rent,

but increasingly in profits from capital investment. With the emergence of the 'gentlemanly-capitalist' alliance at the end of the seventeenth century, the British state was targeted as a source of tribute as war and the creation of the national debt provided the opportunity and the structure for investment. A fiscal system based largely on indirect taxes allowed Britain's dominant elite to source tribute from the mass of the tax-paying population. By 1815 and the end of the Napoleonic Wars, however, the limits of the British state as a source of tribute had been reached. The technique of using the state as an agency that functioned to source and secure tribute was then extended to continental Europe, the United States and the empire. In India, the search for tribute had fuelled British territorial expansion in the second half of the eighteenth century. Land revenue and then, increasingly public works, mainly canals and railways, became its principal source. Expanding and safeguarding tribute was the function of the Raj. In neither setting was policy aimed at the promotion of economic development. When British administrators talked of 'development' they did not mean the improvement of economic and social conditions in the empire but the creation of markets for capital.

The antipathy towards manufacturing at home was matched by an equal reluctance to promote industry in India beyond what was necessary to maintain the trade surplus necessary for the repatriation of the profits from investment. Industrialisation at home underscored the dominant elite's aversion to disruptive forms of wealth creation. Manufacturing was not only less profitable than overseas investment, it had social and political consequences that worked to undermine privilege by facilitating moves for greater citizenship. Economic policy endeavoured to generate wealth whilst marginalising industrial manufacturing. It was for these political reasons that Britain's dominant elite was so reluctant to promote economic development both at home and abroad in the nineteenth century.

References

- Bhattacharya, Sabyasachi (1965), 'Laissez Faire in India', *The Indian Economic and Social History Review*, Vol. II, No. 1, pp. 1-22.
- Cain, P J and Hopkins A G, (1993), *British Imperialism*. Vol. 1 *Innovation and Expansion 1688-1914* and Vol. 2, *Crisis and Deconstruction, 1914-1990*, London: Longman.
- Cannadine, David (1995), 'Review Article. The empire strikes back', *Past & Present*, No. 147, p. 180-94.
- Cautley, P T (1849), 'Canals of Irrigation in the North-Western Provinces', *Calcutta Review*, XII, pp.79-183.
- Charlesworth, Neil (1982), *British Rule and the Indian Economy, 1800-1914*, London: Macmillan.
- Dacosta, John (1877), *The Indian Budget for 1877-78. Remarks on the Financial position of the Government of India. Respectfully Addressed to Members of Parliament, Holders of Indian Stock, Members of the East India and Aborigines Protection Societies and other Englishmen Interested in our Indian Empire*, p. 31-2, London: London: William. H. Allen & Co.
- Deakin, Alfred, (1893), *Irrigated India. An Australian view of India and Ceylon and their Irrigation and Agriculture*, London: W. Thacker & Co.
- Dutt, R C (1904), *The Economic History of India in the Victorian Age. From the Accession of Queen Victoria in 1837 to the Commencement of the Twentieth Century*, Vol. II. London: Keegan Paul, Trench, Trubner.
- Economist*, (1858a) 'Why is Not British Capital More Largely Invested in India?', *Economist*, October 9, 1858, p. 1121-22.
- Economist* (1858b) 'Indian Loans', *Economist*, January 9, 1858, p. 29-30.
- Government of India, (1856) Minute by Marquis of Dalhousie, February 1856, reviewing his Administration in India, 1848-56 1856, *Parliamentary Papers*, 245.
- Government of India (1862), Report of Colonel Baird Smith to Indian Government on Commercial Condition of N.W. Province of India and recent Famine. *Parliamentary Papers*, 29.

Government of India (1867), 'Note on the Measures to be adopted for the Extension of Irrigation Works in India, by aid of Special Loans to be raised for the Purpose' by Colonel R. Strachey, Secretary to the Government of India, Public Works Department, Calcutta February 10, 1865. Despatches on Irrigation in India since Transfer of Government of India to H.M., *Parliamentary Papers*. 105.

Government of India, (1870) Enclosure to India Public Works Letter, No 65, dated April 27, 1866, (Circular No. 25, Public Works), Government of India, Public Works Department, Civil Works, Agricultural, Fort William, March 22, 1866, Correspondence between Government of India, Governments of Bombay and Madras and the Secretary of State for India, relative to the Prosecution of Irrigation Works from Capital raised by Loan, *Parliamentary Papers*, 389.

Government of India, (1878) Select Committee on Expediency of constructing in India Public Works with Money raised on Loan, and Prevention of Famine, Report, Proceedings, Minutes of Evidence, Appendix, Index, *Parliamentary Papers*, 333.

Government of India, (1879) Report from the Select Committee on Expediency of constructing in India Public Works with Money raised on Loan, and Prevention of Famine, 1878-79, *Parliamentary Papers*, 1879, 312.

Government of India, (1880) *Report of the Indian Famine Commission*, Part II, Measures of Protection and Prevention, 1880, *Parliamentary Papers*, 2735.

John Bull (1877) *John Bull*, December 15, 1877.

Jenks, Leland H, (1971), *The migration of British capital to 1875*, London: Nelson.

Kumar, Dharma (1996), 'Review: Native Capitalists and Laissez-Faire Bureaucrats? - India 1858-1914', *Modern Asian Studies*, Vol. 30, No. 3, pp. 725-736.

Macpherson, W.J., (1972), 'Economic Development in India under the British crown, 1858-147', in A.J. Youngson (ed.), *Economic Development in the Long Run*, London: George Allen and Unwin, pp. 126-191.

Probny, L.C., (1880), *Is India Solvent?*, London: Effingham Wilson.

Ripon (1881), Marquis of Ripon, KG to the Marquis of Hartington, Viceroy's Camp, Agra, November 12, 1881, No 59, 1881. The Marquis of Ripon. Correspondence with the Secretary of State for India. 1881, BP7/3.

- Sen, Sunanda (2003), 'Tributes and Transfers from Colonial India', in G. Balachandran, ed., *India and the World Economy*, Delhi: Oxford University Press.
- Stokes, Eric (1980), 'Bureaucracy and Ideology: Britain and India in the Nineteenth Century', *Transactions of the Royal Historical Society*, 5th series 30 pp.131-156.
- Stone, Ian (1984), *Canal Irrigation in British India. Perspectives on technological change in a peasant economy*, Cambridge: Cambridge University Press.
- Strachey, John and Richard (1986), *The Finances and Public Works of India, 1869-1881*, Delhi: Gian Publishing House [First published, 1881].
- The Times* (1877), *The Times*, January 23, 1877.
- Visaria, Leela and Visaria, Pravin (1983), 'Population (1757-1947)', in Kumar, Dharma, ed., *The Cambridge Economic History of India*, Vol. II, c. 1757-2003, New Delhi: Orient Longman.
- Whitcombe, Elizabeth (1971), *Agrarian Conditions in Northern India. The United Provinces under British Rule, 1860-1900*, New Delhi: Thompson Press.