1.1 In tropical countries, especially in Asia, irrigation has developed as the most important productive force. For centuries organisation of production revolved round the development of irrigation facilities. As a result, in India, as elsewhere in Asia, indigenous irrigation systems occupied a central place in the society. And, the State had been playing a vital role in the various phases of development of Irrigation works.

A widely accepted fact is that colonial intervention set in motion a process of degeneration and disintegration of the indigenous institutions in the periphery. What, perhaps, is not so widely accepted relates to the interpretation of the institutions which were replaced. The process of incorporation involved replacement of the institutions of the periphery with those that facilitated subordination of the indigenous interests to that of the metropolitan - a replacement that facilitated extraction and transfer of surplus from the periphery to the centre. The process of modifying, uprooting or displacement, depending upon the context, is an all embracing process reflecting in an 'overdeveloped state' with its ramifications down to the settlement of revenue collection from the peasant. Only understanding these processes of degeneration and disintegration at all levels can unravel the distortions that characterise the present and continue to retard the process of development in the third world countries like India.
The present study is one such attempt to explore the impact of the imperial intervention in a dry region of South India during 1858-1947, on irrigation, the most important productive force in any semi-tropical agrarian economy.

1.2 Review of Literature

* Though there are not many studies on the imperial transformation of indigenous institutions harnessing local resources, some interesting work has been done on the impact of British intervention on irrigation and its consequent effects in general for different regions.¹

Sarada Raju's work deals, in a general way, with the economic conditions in the Madras Presidency during 1800-1850 i.e., during the East India Company's rule. Irrigation is discussed as one of the related aspects of agricultural development. Irrigation policy of the EIC, the sources of irrigation in the Presidency during the Company's rule and working of the Kudimaramat are discussed. The expenditure on irrigation works, on the whole, under the Company was inadequate though it was 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 a revenue several times the expenditure. The effectiveness of the voluntary contribution of Kudimaramat labour in the Madras Presidency before the British occupation and the disintegration of Kudimaramat under the EIC, in the context of the decay of village corporate life and the weakening of the power of village officers are discussed. The village itself was no longer a little republic, but became a unit of a vast centralized system.
'heart and soul' of the indigenous irrigation institutions, in pre-British days.

In her pioneering work on the impact of British irrigation policy, Elizabeth Whitcorobe considers the case of Northwestern provinces and Oudh in Northern India. Her analysis runs as follows: The introduction of the Ganges Canal in the region was a part of the overall modernization programme of the British. The British government sought to superimpose an institutional structure that would subserve their interests. The international finance system could now provide for the ready movement of capital abroad, for large scale construction under contract by means of the joint-stock discount houses, the British development on the lines of the credit mobiliser. Engineers with considerable experience of railways and, to a lesser extent, of canals were readily available. The whole question of investment in India was given unparalleled publicity. After the unhappy experiences of the indigo planters in Bengal, some such entanglement was inevitable in an environment where the land was the prime source of wealth, on which the people depended overwhelmingly for their livelihood, the government for its revenue, and the investors for their dividends. The immediate outlet was the public works like roads, railways and canals.

But the conditions in the North Western Provinces and Oudh, Whitcombe argues, were not such, however, as permitted government to pursue these aims unimpeded. Fundamental and far reaching limitations were inherent in the environment itself – social and ecological – upon which the whole edifice of modernity was constructed. The society which was to be thus improved was long
established and hierarchical; its minute pattern of localized rights to which its small-scale pattern of cultivation had given rise was overlaid by a patchy, disintegrating structure of superior powers.

The inroad of canals had left roost wells in disuse and that well-sinking was not almost entirely abandoned. The well irrigation was replaced by canal irrigation not by choice. The increase in the area irrigated was substantial. The cost, however, Whitcorobe laments, was considerable.

The canals couldn't protect the people from scarcity and famine. In the most extensively irrigated of the canal tracts, the health of the people as well as the condition of the soil on which they depended for their livelihood deteriorated badly under the effects of swamps. Percolation from main channels or distributaries created swamps, the worst consequence of which was the aggravation of malaria.

Thus, canal irrigation in the Doab was an imposed technology from outside, which was inappropriate and caused pronounced environmental and economic disruption.

Writing much later Ian Stone, taking into account the same canal and the same region, in contrast to Whitcorobe, shows how the British irrigation policy had brought fortunes to the people. Ian Stone contradicts Whitcorobe's view with regard to the character of the peasants' response to the canal. He considers canal irrigation to be an appropriate technology which was adopted by the cultivators immediately realizing the benefits it would bring in. The canal was an innovation which met their
requirements, and it did so because it slotted into the productive aspects of the peasant system in a way which made it more advantageous than even the most favourable well irrigation. He even says that where the cultivators were able to combine well and canal irrigation, they could reap the benefits of both systems without incurring the disadvantages of either.\(^5\)

Opposing the view of Whitcombe and other dependency theorists on the shifts from subsistence crops to commercial crops, Attwood argues that in the early 20th century Western India, it was in response to fiscal pressures and cultivators' choices, that the government turned from a policy favouring subsistence crop irrigation to one favouring sugar cane.

David Ludden gives a long term view on irrigation in the Tirunelveli district of Tamil Nadu. He discusses the political economy of the tradition of building of irrigation works, irrigation development in the district upto 1800, financing irrigation under the British rule and modern trends and dilemmas. The emphasis is more on the construction and the parties involved in it, and less on the maintenance and repairing of these works, which deserve particular emphasis when one talks about minor irrigation.

On the institutional front Walter J. Coward deserves particular attention.\(^6\) Though it doesn't refer to institutions in India, his book discusses the Community Irrigation Systems and Bureaucratically Operated Irrigation Systems under two separate parts. Our concern, here, is with the Community Irrigation Systems operating in different parts of the world. Irrigation units may be viewed in a variety of perspectives: as hydrologic
entities, as engineering networks, as farming systems or as organizational entities. Here, the authors are mainly concerned with the last perspective, occasionally in connection with either of the other three entities.

Community irrigation systems are the systems in which the water users are directly responsible for maintaining and operating the system, which they or their predecessors have usually built.

Clifford Geertz's article, 'Organization of the Balinese Subak', is on the community organization and management of local irrigation works in one of the Indonesian islands. The local irrigation society is known as the Subak. It plays a crucial role in the regulation of water supply. A Subak is defined as all the rice terraces irrigated from a single dam and a major canal. All individuals owning such land are citizens of the Subak. The main feature is the one-daro-one Subak relationship. Each Subak under each source of irrigation has its own organization and members to cater to the needs of regular and effective distribution of water.

Richard K. Beardsley and Robert E. Ward, write on Japanese Irrigation Co-operatives. They describe Niiike as a clearly defined, natural socio-cultural unit and also a rice-growing settlement. Besides several other local based agricultural works, the households of Niiike participate in water-use communities of varying sizes. They attend to various water-control problems like irrigation, drainage and protection against flood.
Henry T. Lewis's,'Irrigation Societies in the Northern Philippines', refers to the Zangjeras or cooperative irrigation societies in Philippines as a special development of earlier prevailing societies of the past. The manifest function of these Zangjeras is to procure a stable, reliable supply of water, which can increase crop production. In some Zangjeras the members are all land owners; in some, land owners and tenants, and, in several, all members are tenants. In a few, formal ownership of the land is vested in the Zangjera itself with members owning only rights of use to the land. These Zangjeras constitute relatively large and, at the same time, a stable social grouping with a shared community interest. These groupings generally must protect their water rights and obtain materials to improve upon and maintain the irrigation works.

The above mentioned three societies refer to the organizations as they are operating today in the areas mentioned. Some of them are unit-based organizations, which might have people from the immediate neighbourhood of the unit of irrigation work in a particular village, as its members, as others are canal-based organisations with its members drawn from different villages, but using the water of the same canal, as members of the irrigation organizations.

The other two articles in the book refer to traditional and historical customs of irrigation development in Sri Lanka. Edmund R. Leach's article on 'Village Irrigation in the Dry Zone' of Sri Lanka describes the state of affairs in a particular village by name Pul Eliya in 1954, as a continuity from century to century almost unaffected by the passage of history.
Elsewhere he argues that the general arrangement of the irrigation system in the dry zones of Sri Lanka at the present time is very much the same as it was in the eleventh century A.D. He questions Wittfogel's 'Oriental Despotism' for its presumption of 'full aridity' and the consequent establishment of centralised, bureaucratically maintained "hydraulic society' to manage the large scale irrigation by citing examples of dry zones of ancient Ceylon. He further states that from time immemorial normal repair work to village tanks had been the ordinary work of ordinary villagers. Major repairs and new constructions were traditionally undertaken by a specialised caste groups of Tamil labourers (kularokatti), but these people worked for the villagers on direct contract; they were not employees of the state. It is only since about 1860 that a centralised Irrigation Department has had the right to interfere in matters relating to the maintenance and use of village tanks.

The initiative of the Sinhalese Kings had, by the beginning of the twelfth century, brought into being a vast array of irrigation works spread over a substantial part of the dry zone. The gradual development of the irrigation system of Ceylon can be systematically traced over a long period of time and it reflects a high degree of sophistication in technology unparalleled elsewhere in the whole of South Asia. Large scale irrigation works played an important role in the civilization of ancient and early medieval Ceylon. However, the vast multitude of small village tanks, reflecting a less sophisticated
technology, and sponsored mostly by non-governmental enterprise were of vital importance.  

In the first half century of British rule in Ceylon there was no worthwhile activity in maintaining and restoring irrigation works. The problem was partly, if not largely, that of the British rulers' own making. In abolishing forced services (rajakariya) in 1832 and in creating minor courts in 1843, they had deprived Velvldanes (irrigation headmen), and gansabhawas (village councils) of the only effective means of compelling obedience to village agricultural customs. Prejudicial effects originating from the abolition of rajakarlya led to a decline in the cooperative spirit. The British government tried to revive the traditional irrigation customs through the Paddy Lands Irrigation Ordinance of 1861. However, the ordinance did not suffice to restore native agriculture to its old position after such a long neglect. In pre-British times village agriculture, in Ceylon, was based on a community of economic action and purpose, built around mudlands held on an individualistic basis. As this corporate structure was undermined by the new forces of trade, individualism, and indiscipline, and as the long endemic virus of litigation prospered in this more congenial habitat, the continuation of traditional agricultural customs became more difficult.

In his recent recent work on irrigation institutions, Wade discusses the village-based corporate institutions as they exist today in the 31 canal irrigated villages in the Kurnool district of Andhra Pradesh. While crop protection and water distribution are the two central services, the council also organizes the
supply of other public goods important to the village life. Referring to the Kottapalle village council which is involved in resource management within the village boundaries, in regulating what can and cannot be done and in sanctioning those regulations, he makes a comparative study of corporate and non-corporate villages and shows why people in corporate villages come together to manage their common property resources unlike people in non-corporate villages. Water scarcity is the main impetus to corporate control. In canal irrigated villages, the tail-enders facing water shortages will push for strong community organisation and formal rules of water allocation, while top-end farmers will be less inclined. This is because the risk of crop water stress and water conflict increases steadily down the length of distributary, or with the proposition that risk increases sharply in the bottom third.

Collective control, Wade states, is concerned primarily with the tasks of (i) getting more water to the village (ii) distributing it within the village land, and (iii) resolving water conflicts. The central variable leading to collective management is the risk of crop loss and social conflict faced by many or all cultivators as a result of the actions of the people. The magnitude of this risk sets the premium on the village's ability to tighten its internal ordering, to create institutions of unitary rule which are continuous, calculable and effective. In short, according to Wade, ecological conditions, scarcity, uncertainty and risk associated with the availability and use of water for irrigation make people to evolve organisations which
manage resources keeping the common interest as the centre of concern.

Another work on indigenous institutions for rural development deals, in its first section, with irrigation tanks and the social organisational arrangements which have traditionally developed around them for the purpose of water allocation, maintenance of infrastructure and arbitration of water related disputes, in the Chengalpattu district of Tamil Nadu. It provides historical details that would present a plausible picture of the functioning of the Ery or tank systems. It describes the essential feature of the technology of tanks and certain historical developments relating to the administration of tanks. Maintenance of these tanks has in the last hundred years come to be vested with the government. Earlier they were more or less completely under the management of user communities. The authors argue that the authority of the user communities over the tanks was however not taken away from them in one stroke. It happened through different stages. First, a revenue hungry colonial government redefined tenurial relations and stopped the flow of local resources to the tanks, meant for their repairs and their upkeep. This led to their neglect which in turn affected the state revenues in the long run which in turn drove the government to take them over for rehabilitation. The post-independence Indian government inherited these administrative structures and did not consider restructuring them.

They further argue that under the British rule, land coming into the market, with the development of individual property rights and the land markets; and with the control of tanks
passing over to the government, with the development of private sources of water such as tube wells, user communities have lost much of their status and prestige. They have in fact ceased to function in many villages. Where they are functioning they do so as "underground" institutions. During the British rule in India, local communities and their participation in the local management of water resources were destroyed. The mechanical continuation of this colonial approach during the post-independence period has succeeded in completely alienating people and their institutions from the state. Irrigation development has been dominated by technocrats whose concern has been merely with quantities, flows and structures.

The most recent work on irrigation institutions by Nirmal Sengupta makes a comparative study of the institutions in India and the Philippines. The second part of this book gives an account of the historical background of the irrigation systems of both the countries. It indicates where more developed organisations may be expected, as well as, why organisations may differ widely in forms. It is argued that the very existence of the indigenous systems, in both the countries, made it necessary for the colonial governments to adopt specific policies towards them. The author discusses the British policy towards the canal management in North India and South India separately. He discusses at length the enforcement of Kudimaramat by the colonial government in South India. In this context, the author points out how the colonial policy of the British in India differed from that of the Spanish in the Philippines. Some
Zanjeras (local institutions for irrigation management) of the Philippines too faced crises of management during the Spanish rule. But there the government did not compel the farmers to contribute unpaid labour while naming it voluntary communal labour. The Spanish colonial government simply remained indifferent to the failing Zanjeras. In contrast, the British government in India could not be so aloof as they suffered the consequent loss of revenue.¹³

The studies reviewed above, in the main, bring out a range of issues involved in the nature and extent of the impact of the colonial intervention on the indigenous resource exploitation and the attendant institutions with particular reference to irrigation. The present study is an attempt to study in detail the British intervention in irrigation development in a dry region in the erstwhile Madras Presidency. Though the relevance of such studies for appropriate policy formulation and implementation regarding the development and utilisation of scarce water resources in these areas can hardly be exaggerated, there are very few studies available.¹⁴

1.3 The Region

The study is confined to the Rayalaseema region in South India. The choice of the region is deliberate. This dry region, today is categorised as a drought prone area, is dominated mainly by small or minor sources of irrigation. And roost of these sources, like tanks, have a very long history with their own vicissitudes which may be helpful in understanding and managing the current irrigation systems in this region. This is a region
in Andhra Pradesh, partly spilling over to Karnataka, where there existed the traditional irrigation systems and the attendant institutions. Of particular interest is the nature of changes that these systems of irrigation underwent along with the institutions for their construction and management during the period of the British intervention. Understanding this critical phase of transition immediately preceding the post-independence era is essential to set the development agenda in the proper perspective.\textsuperscript{15}

Considering the historical context, Rayalaseema here refers to the present five districts of Bellary, Cuddapah, Kurnool, Anantapur and Chittoor. While Bellary is presently in the Karnataka state, the latter four districts form part of Andhra Pradesh.

The region under study was known as the Ceded Districts when it came under British rule in 1800. The Ceded Districts which formed a part of the old Hindu kingdom of Vijayanagar, fell into the hands of a number of petty chiefs called Poligars after the battle of Talikotta in 1565. In 1677-78, these districts were overrun by Shivaji. Later on, they formed a part of the Nizam's dominions but were subsequently incorporated in the kingdom of Mysore by Hyder Ali. By the treaty of 1792, a greater part of the Ceded Districts reverted to the Nizam and the remainder was allotted to him in 1799. In the year 1800, under a treaty of general defensive alliance the Nizam ceded the districts to the East India Company in lieu of the expense of the subsidiary force employed to protect him.\textsuperscript{16}
Rayalaseema region went through a series of reorganisation at the district and taluk levels. When these districts were ceded in 1800, these were under the single Collectorate of Bellary. In 1807 the region was divided into two collectorates of Bellary and Cuddapah. Though the rights of sovereignty over Kurnool district were vested with the Company, the Muslim rule continued in the district till 1839. It then consisted of the taluks of Kurnool Proper namely Raroallakot, Nandikotkur, Nandyal and Sirvel.

The Nawab of Kurnool was dispossessed in 1839 for rebellious conduct. It was then placed under a Commissioner with a military assistant, and continued till July 1843, when by the Act X of that year, a government Agent was appointed, subject to special restrictions. The agency administration lasted till 1858-59, when the taluks of Cumbum, Markapur and Koilkuntla from the Cuddapah district and that of Pattikonda from Bellary district were added to Kurnool proper and the whole formed into a Collectorate.

At the time of the cession the district of Bellary had consisted of twenty taluks. By 1870, after the reorganisation of the taluks from time to time, this number had come down to twelve. They are Bellary, Raidurg, Hospet, Gooty, Tadpatri, Alur, Adoni, Anantapur, Dharmavaram, Penukonda, Hindupur and Hadagalli.

The district of Anantapur was carved out of the old Bellary district at the beginning of 1882. It was neither a geographical, historical nor ethnical entity but the product of administrative convenience, the former Bellary charge having been
found to be unworkably large. The district was initially made up of the eight taluks of Anantapur, Dharmavaram, Gooty, Hindupur, Kalyanadurg, Madakasira, Penukonda and Tadipatri. The taluk of Kadiri from the Cuddapah district was incorporated with this district in 1910, thus making the total number of taluks of the district nine. Kadiri taluk was the largest taluk in the region under study.

The Cuddapah district had initially consisted of seven taluks of Jammalamadugu, Proddatur, Budwail, Pullampet, Sidhout, Cuddapah and Pulivendla in the Main-division and the four taluks of Rayachoti, Kadiri, Voyalpad and Madanapalli in the sub-division. As mentioned above, the taluk of Kadiri was transferred to Anantapur. And the taluks of Madanapalli and Voyalpad were absorbed by the new district of Chittoor which came into being on April 1, 1911. Besides the taluks of Madanapalli and Voyalpad, the Chittoor district comprised the taluks of Chittoor, Palamaner and Chandragiri transferred from the North Arcot district as well as the Zamindaris of Punganur, Kalahasti, Puttur and Tiruttani (old Karvetnagar estate). Kangundi taluk of North Arcot district with the exception of 22 villages was transferred to the Chittoor district in 1928.

1.4 The Period of Study

The period 1858 - 1947 has a great significance in the economic history of India. This was the period during which, the consolidation of the British rule was followed by the intervention of the Crown through its various administrative and decentralised policies. This was a period of high water mark, of the British imperial expansion and penetration of capital into
"the Indian periphery. One of the main outlets for the British capital was the public works development. This was a period of some of the worst famines too. The Madras Presidency, particularly the region under study witnessed severe famines for several years during this period. Expansion and development of public works like railways and irrigation works were considered to be an effective means of reducing the impact of famines. This was also the period during which the indigenous institutions were undergoing tremendous changes.

The main thrust of the present study is on the impact of imperial intervention on the development of different sources of irrigation, indigenous institutions for construction and maintenance of irrigation works and the related aspects of the agrarian economy of Rayalaseema.

1.5 Objectives of the Study

The main objectives of the study are:

1. To review the nature and evolution of irrigation policy in the British India with particular reference to the Madras Presidency during the period 1858-1947.

2. To study the process of transition of water resources from being predominantly a public resource to that of a private resource, and with it the emerging alternative technological and institutional forms which influence the resource use.

3. To analyze the process of disintegration of Dasabandam and Kudimaramat - the traditional indigenous institutions for the construction and maintenance of water harvesting systems.
4. To study the causes for and the consequences of private investment in public irrigation works with particular reference to the Kurnool-Cuddapah Canal.

5. To study the origin and development of water rates policy under the British government and

6. To attempt to present a comprehensive view of the nature of the British intervention in the policy relating to the development and use of irrigation in the dry regions and their immediate as well as long run impact.

1.6 The Sources of Data

This study is essentially based on the primary archival sources like the District Records, Proceedings of Board of Revenue of the Madras Presidency, Proceedings of Madras Government in the Revenue Department, Proceedings of the Public Works Department, G.O.s of the different departments, including Revenue, Land Revenue, Board of Revenue, Settlement and PWD which are available at the Archives at Madras, Tirupathi and Hyderabad. Retained Revenue Disposals available at the District Collectorate Offices of Bellary, Anantapur and Kurnool are the other important sources used. Mackenzie Manuscripts available at the Oriental Manuscripts Library at Madras and Telugu University Library at Hyderabad are also used. These are supplemented by the secondary sources including Gazetteers.

1.7 The Chapter Outline

The thesis is divided into seven chapters. The second chapter in the present thesis provides the agrarian background of the region during the Crown's regime. The seasons in the districts under consideration, during different faslis and the data on
rainfall are presented. The land revenue policy of the British is discussed in brief. Changes in the land holdings and cropping pattern are discussed at length. Famines and the famine related policies of the British government are also reviewed.

The third and the fourth chapters form the core of the thesis. The third chapter deals with the evolution of the irrigation policy under the British. The Tank Restoration Scheme and its failure in protecting and restoring the small tanks of the region is discussed in detail. The emergence of 'well' as a private and protective source of irrigation is highlighted.

The fourth chapter in the present thesis discusses the three indigenous irrigation institutions of Dasabandam, Kudimaramat and Irrigation Panchayats. The effective functioning of the institution of Dasabandam during the pre-British days and the process of its disintegration during the British period, particularly under the Crown, is discussed in detail. The formal enactment of Kudimaramat and the emergence of formal bodies like Irrigation Panchayats, as a consequence of the changes in the imperial irrigation policy, are also discussed.

The fifth chapter describes the origin of the private company known as the Madras Irrigation and Canal Company, the construction of the Kurnool-Cuddapah Canal by it, and the causes for its failure. The failure of the canal even under the Madras government is also discussed.

The sixth chapter reviews the origin and development of the water rate policy under the British.

The main conclusions that emerge out of the study are presented in the last chapter.
Notes


5. Ian Stone, Canal Irrigation, P.69-76, 103.


11.


15. The present author earlier worked on an M.Phil dissertation on "Irrigation in the Ceded Districts: 1800 – 1857". The present work is an extension of that work with the extension of period of study as well as widening the coverage of source material relating to both pre-British period and also the British period.


17. A Gazetteer of Southern India, Madras, 1855, P.72.


