IRRIGATION AND AGRARIAN RELATIONSHIPS

Irrigation has always held the key to agricultural prosperity; this is particularly true of dry and arid regions with a low rainfall and for regions with uncertain rainfall. Such regions are entirely at the mercy of artificial irrigation. During colonial rule even though the government tried to develop some regions agriculturally through the construction of canals, others had to make their own arrangements. In most cases these were private arrangements and were made by the landlords in their own enlightened self-interest. The tenants had to rely on these as they themselves were neither expected to meet nor capable of meeting the cost of construction and maintenance of large irrigation works. However, they were asked to pay a very heavy price which was far in excess of the benefits they derived from such a system.

We have tried to enumerate the factors which marred the efficiency of the irrigation system and present an account


2 Revenue Department (Land Revenue) Government of Bihar and Orissa, File Nos. 55-58, November 1915, p.20.

3 Ibid.
of the various problems faced by it. These problems range from the complex nature of their management to flaws in the construction of irrigation works. In course of time these began to affect the working of the system and gave rise to social tensions which led to its decline. We shall discuss the structural implications of this development. We would also examine the extent to which it contributed to the worsening of relationship between the landlord and his tenant.

The entire irrigation system of Patna and Tirhut divisions can be broadly divided into the following categories:

(a) Canals
(b) Channels and tanks
(c) Wells

The canal system of irrigation was prevalent in both the divisions but it was more widespread in Patna division. The major scheme of irrigation in Patna division was the Sone Canal System which supplied water to Shahabad district in the west and Gaya and Patna districts in the east. The idea of using the water of the river Sone first struck Col. C.H. Dickens and became a reality in 1875. About 80% of the


area irrigated by the canal lay in Shahabad, 11% in Gaya and 9% in Patna district. The system comprised 367 miles of main and branch canals with 1217 miles of distributaries and 3237 miles of village channels which were private properties. Only the main branch and the distributaries were under government control. In 1875 the yearly cultivated area commanded by the canal was anticipated at 10,43,680 acres.

However, these hopes were belied. The supply of water from the river Son was much smaller than expected. The maximum area irrigated was 6,19,033 acres in 1920-21. It was expected that the chief demand for water would be for the rabi crop but soon it was found that 70% of the entire irrigated area was meant for the kharif or autumn crop of which rice constituted the main produce. The area irrigated by the canal under rice between 1895 and 1900 was 3,34,565 acres while the same under rabi was 1,28,616 acres.

The canal irrigation was not so widespread in Tirhut division. Champaran and to some extent Saran were the only districts which enjoyed the benefit of canal irrigation.

6 Ibid.
7 L.S.S. O'Malley, Shahabad District Gazetteer, p.79.
8 Ibid.
The major river in this region, Gandak, flowed diagonally from the north-west to the north-east and from which many drainage channels flowed. After the banks of the Gandak were raised, these drainage channels became dry and many important sources of irrigation were lost. It was soon realised that these channels could be revitalised with sluices in the embankment. Thus these drainage channels took the shape of canals in 1901. The most important of these were the Gandak channels which nearly bisected the entire Saran district into two halves; most of the important areas of cultivation lay north of the railway line which ran from Sonepur to Mararwah. The indigo planters were the first to point out the flaws in the construction of the embankment. Therefore, it was at their initiative that five sluices were made in the Gandak embankment between 1877 and 1880 and these were connected with the earlier streams of channels arising near the embankment. These streams of channels, which comprised Daha, Gandaki, Dhanai and Gogri, took care of the entire northern part of the district of Saran as far as canal irrigation was concerned.

The canal system in both Patna and Tirhut divisions constructed by the government proved, however, to be quite

10 Ibid.
11 Ibid.
inadequate in meeting the demand for water, hence the need for private arrangements arose. Such arrangements were not being made for the first time; these pre-existed and were further buttressed from time to time by new constructions or improvements. Most of these private irrigation works were the result of the efforts made by the landlords, particularly the bigger ones, as a part of their economic and welfare measure towards the tenants. These were the traditional forms of irrigation known as the ahar (reservoir or tank) and the pyne (channel) systems and were found in both Patna and Tirhut divisions.

Ahar was an artificial catchment basin which was meant to store not only rainwater but also flood water. These catchment basins were of a rectangular shape. Embankments were raised on three sides and one side was kept open for the water to enter. The drainage was somewhere at the top. Many tanks in Tirhut division were constructed more out of religious considerations than any practical use because such

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construction was considered to be a pious act. These were also constructed to enhance one's social prestige and to gain honour. The bigger the tank the greater the fame. As a popular saying goes:

"Pokhar Rajokhar aur sab pohkara;
Raja Sivai Singh aur sab chhokra".

"The tank of Rajokhar is indeed a tank; all the rest are puddles. Raja Sivai Singh was, indeed, a king; all the others were princelets". Raja Sivai Singh was a king prior to the Muhammedan conquest in Muzaffarpur district. He was known later by his tank at Rajokhar.

The pynes, which were very popular in Gaya district, were long artificial channels, sometimes 10-12 or even 20 miles long. Some were large with many distributories whereas others were small with a few or no distributories. Those which irrigated many thousand acres were known as dasiain sum, literally meaning pynes with ten branches. Such a pyne could irrigate hundreds of villages. In Patna division, and particularly in Gaya district, where rivers

18 Ibid., p.258.
19 J.F.W. James, op.cit., p.17.
were not numerous and only a few of them carried water except during the rainy season, one seldom finds a pyne that served only a single village. Most pynes supplied several villages and were several miles in length.

The entire pyne system can be broken into three basic constituents: (a) the main channels known as the main pynes; (b) the smaller channels taking off from them were called bhoklas and (c) the smallest channels that lead immediately into the fields were known as karhas. The pynes were led directly from the river embankment by digging long channels passing through the field. The pynes and aharas systems were complementary to each other. At some places the pynes fed the aharas whereas at others the aharas supplied water to the pynes. The process by which water was stored in the tanks was known as gerabandi. The rivers were dammed by means of earth and wattle and water diverted first into one pyre and then another until all the reservoirs or aharas fed by the various pynes were full.

The ahar and pyne system of irrigation was most widespread in Patna division. In fact it suited only those areas which had less moisture on soil and lacked perennial

21 Ibid.

22 Ibid.

sources of water. Areas which were deficient in this respect had also to depend on other forms of irrigation including wells which then became the chief source.

The choice of well irrigation was influenced by several considerations. In the first place, the level of water table in any given area was an important determinant of this type of irrigation. It was quite widespread in areas which were closer to the river bed or were situated between two rivers. For example, in Gaya district, well irrigation was quite common in the sandy tract between the Sone and Punpun rivers. In Tirhut division the water table was generally high because of high percentage of moisture in the soil; water could be struck without going much deeper into the soil. Well irrigation was, therefore, widely practised in all the districts except Champaran where there was also provision for canal irrigation.

The second consideration which prompted well irrigation was the choice of crops. Valuable crops such as chilli, tobacco, oilseeds, opium, indigo and even sugarcane which required watering at regular intervals could not be left to the vagaries of the monsoon. Wherever such crops were grown

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26 Ibid.
one invariably found an infrastructure of well irrigation. European planters, who specialised mostly in high value crops, also preferred and encouraged well irrigation in their areas. Money was advanced under the scheme of well advances in order to enable the cultivators to construct wells. Such advances were sometimes part of the general offer made by planters to cultivators for cultivation purposes and were given only to those who grew poppy or indigo along with other crops which received less priority. Those who took such loans had to furnish security, mostly in the form of land or any other immovable property. Sometimes a middleman was engaged to lure the cultivators, and some of them brought in 20 to 30 persons each. These cultivators offered joint personal security. Loans were given free of interest. Despite the planters' efforts, loans for well irrigation did not find many takers.

In Darbhanga district well irrigation was very common in Samastipur, Dalsingsarai and Warisnagar all of which were areas dominated by the planters. The same was the case

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27 S. Moore, op. cit., p.259.
29 S. Moore, op. cit., p.257.
31 Ibid.
with Saran and Muzaffarpur districts. In the former, irrigation from wells formed more than 70% of the total irrigated area while in the latter it accounted for 63% of the total irrigated area. The extent of well irrigation in all the three districts was very large. Well irrigation was also common in areas specialising in garden crops, particularly vegetables. Such areas were located close to the cities and towns and had a vast potential as far as market opportunities were concerned. Garden crops, including fruits and vegetables, require continuous irrigation though in lesser quantity, and were mostly meant for household consumption. Vegetables were mostly grown by Koories who were hardy and could perform manual labour uninterruptedly for long hours. Lifting water from the well was a very tedious job and normally cultivators belonging to higher castes refrained from undertaking it.

The adoption of well irrigation was also influenced by the quality of soil. There was prejudice against irrigating loam soil. Such soil is saliferous and is incapable of retaining moisture because it contains salt. The soil requires plenty of water and is not fit for well irrigation. The absence of continuous water leads to the formation of a

32 Ibid.
33 James, op.cit., p.12.
34 L.S.S.O'Malley, Champaran District Gazetteer, Calcutta, 1907, p.68.
crust below the earth's surface which destroys the soil's fertility. Thus the loam soil once irrigated with well water had to be continuously irrigated in order to keep the land fit for cultivation and to prevent the formation of a crust below the surface of the soil.

The various forms of irrigation discussed above were beset with numerous paradoxes. These were mostly confined to the ahar and pyne systems of irrigation. The first related to their management and work. It was a perpetual source of conflict between the landlord and his tenant. The ahar and pyne irrigation were the oldest forms of irrigation, and formed the lifeline of irrigation work in Patna division. Both were quite elaborate in design and extent. Their construction and maintenance was a difficult job and generally involved large financial outlays. It was beyond

35 S. Moore, op. cit., p. 257.

36 Revenue Department (Land Revenue), Government of Bihar and Orissa File No. 58-67 of 1925, pp. 8-9. The system of irrigation from channels and tanks was ordinarily controlled by the landlords. The arrangement by which different villages obtained water on different days was so complicated that it could perhaps hardly be managed by the raiyats themselves. The question of how much water each village was to take naturally gave rise to many disputes and it frequently became a cause of riots when water was scarce. In large estates like the Aminawan in the Patna district the landlord's agent had the authority to resolve such disputes. But most of the estates had been so subdivided that the landlords were no more than small peasant proprietors. In such estates cultivators had to settle among themselves the order of taking water. This was done more often than not with much rancour and mutual illwill.
the means of the ordinary peasants to shoulder this burden. Under these circumstances the entire task of constructing and maintaining such a system was performed by the landlords. In fact there was a tradition to this effect. Big zamindaries such as Tikari Raj in Gaya, Darbhanga Raj in Tirhut and Hathwa Raj in Saran made arrangements for irrigation on their own and looked after these.

According to C.E.A.W. Oldham, the Collector of Gaya, "all the large and important pynes in Gaya district were constructed long ago". No new large pynes were constructed during his time. It was his surmise that such large scale works must have been the result of the efforts of a single zamindar and that too a substantial one. The manager of the Darbhanga Raj, R.S. King, was instrumental in getting the maximum out of the Kamla, a major river of Darbhanga district, through the construction of channels and cuts.

The construction and upkeep of the pynes was, thus, regulated by the zamindar or a group of zamindars whose villages were served by them. Any masonry or construction...

38 Ibid.
39 Ibid., pp. 75-76.
40 Revenue Department (Land Revenue), Government of Bengal, File 29-32, March 1912, pp. 2-3. The repair of contd...
work was paid for by the zamindars. Small repair works, however, had to be carried out by the voluntary labour force of the cultivators. This was known as the goam system. One adult out of every family, which benefited from such irrigation work, volunteered to work for carrying out the repairs. This work was performed without any remuneration either in cash or in kind. Like the customary arrangement regulating the liabilities of the zamindars, there was an arrangement regulating the rights for water sharing of the tanks, and the distribution of water to different villages and again within the village to different blocks. This system was commonly known as pahai in Patna division.

According to it each village and each block within the village was entitled to receive water for a fixed number of hours. Similarly within the block each cultivator was allowed to divert the water to his own field for a fixed

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fn 40 contd...

irrigation did not cost much. The cost varied from four to twelve annas an acre. When the Tikari estate was under the court of wards, it was calculated that 7% of the rental in irrigated villages was to be spent on maintenance and repair of irrigation works. However, minor repairs like earthing, cutting, etc. were to be done by tenants themselves.


42 Ibid.

43 Ibid.
period of time during which no one else may do so. However, those cultivators, whose fields were situated along the course of the channel, could lift water from it.

In the Tikari Raj a manual was prepared to regulate the distribution of water for a limited area. It was known as the Lal Bahi (Red Register). The manual very clearly stated the stipulated time for which a particular tenant was entitled to receive water. The time differed from tenant to tenant depending upon the size of holding.

Such arrangements worked to near perfection till the time they were based on customary rights and ties of mutual understanding and cooperation. However, they showed signs of strain from the beginning of the 20th century. Such affinities were threatened and customary rights tended to erode fast giving rise to social conflicts. Although conflicts were logically inherent in the system of ahar and pyne, certain developments from the second half of the 19th century onwards further contributed to the weakening of the system and affected the level of agricultural productivity.

In the first place the rise in population had far reaching impact on the functioning of the irrigation system. As population rose, proprietary interests became fragmented.

44 Ibid.
leading to the emergence of small proprietors. This was true of both Patna and Tirhut divisions, particularly the latter. This led to the subdivision of big estates into smaller ones thereby reducing their economic viability. The earnings of such estates were not commensurate with their expenses. Many of them thus started falling into debt. Those which could match their expenses with their earnings were reluctant to spend on anything that was not going to add to their social status. Most of them adopted a callous attitude toward irrigation by giving it a low priority. They did not think such investments to be worthwhile.

Subdivisions taking place within the same family often led to mutual jealousies and rivalries. This resulted in open display of strength and wealth. There ensued an intense competition to outtrival each other by leading a life of self-indulgence. Moreover, being financially hard pressed, the smaller proprietors lacked the charity and benevolence that characterised the outlook of the big landlords. They


47 Revenue Department (Land Revenue), Government of Bihar and Orissa, File 58-67, February 1926, p.18. It is, however, argued that the landlord's neglect of the irrigation work was ultimately bound to affect his own interest. He was, therefore, under economic pressure to maintain these works.
were least bothered about the welfare of their tenants.

With the onset of commercialisation there was a flow of urban capital into the agrarian sector. The lure of high profits through speculation in land and crops and above all of unearned income through rent prompted professionals like lawyers, mahajans and traders to invest their capital in land. The flow of such capital was not as large as was the case in Bengal. Nevertheless, it did introduce new elements in the countryside, i.e., persons whose interests were not in consonance with those whose primary occupation was agriculture. In contrast to the traditional landed aristocracy these new purchasers were mostly profit seekers.

Thus the changing pattern of land proprietorship was amply reflected in the emerging agrarian relationships. The new proprietors showed less concern for the irrigation works. Due to extreme subdivision of proprietary interests the cost of repair works that were earlier defrayed by one landlord now had to be shared by several. The responsibility now lay on the joint shoulders of all the successors. In the

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48 Grievances against big landlords existed mainly due to lack of communication with the tenants. They were mostly dependent on their agents who were responsible for the perpetuation of all sorts of atrocities in the name of the former.

49 Memorandum on the Restriction of the Power to Alienate Interest in Land, Calcutta, 1895, p.10.

50 Coupland, op.cit., p.8.
event of any one of them refusing to share the cost, others also followed suit. In any case responsibility of all meant responsibility of none.

With the proliferation in the number of proprietary holdings, resource mobilisation for the maintenance of existing irrigation work became nearly impossible let alone the construction of new ones. Clash of interest and authority always came in the way of united action. Oldham, the Collector of Gaya, felt very much concerned about a large pyne falling in disrepair, leading to a famine-like situation in 1912 in a large tract. He persuaded the local zamindars to take the work in hand but found that the proprietary interests in land were so much divided that it was difficult to achieve anything. He also observed that the greater part of the cultivating class, which formed a large proportion of the total population, had little to spare after meeting the necessities of life.

It has been pointed out especially by Grierson, the Collector of Gaya in 1888, that the neglect of the irrigation works was ultimately going to harm the interests of the proprietors because it would lead to decline in productivity and subsequently a decline in his share of the

51 Ibid., p.2.
52 L.S.S.O'Malley, Gaya District, op.cit., p.136.
53 Ibid.
produce. However the question was not one of not wanting to undertake the repair work but whether they were in a position to bear the cost of maintaining the irrigation works. We find that even in estates that were looked after by the government irrigation works suffered on account of non-grant of funds. The following statement shows the state of affairs regarding the maintenance of irrigation works in government estates:

<table>
<thead>
<tr>
<th>Year</th>
<th>Total applied for by local officers</th>
<th>Total sanctioned by govt.</th>
<th>Applied for by Collector of Gaya</th>
<th>Allowed by the Board of Revenue, Gaya</th>
</tr>
</thead>
<tbody>
<tr>
<td>1885-86</td>
<td>80,898</td>
<td>27,000</td>
<td>21,366</td>
<td>9,000</td>
</tr>
<tr>
<td>1886-87</td>
<td>80,745</td>
<td>40,000</td>
<td>17,852</td>
<td>4,000</td>
</tr>
<tr>
<td>1887-88</td>
<td>81,514</td>
<td>40,000</td>
<td>10,410</td>
<td>5,000</td>
</tr>
<tr>
<td>1888-89</td>
<td>107,616</td>
<td>40,000</td>
<td>9,863</td>
<td>5,200</td>
</tr>
<tr>
<td>1889-90</td>
<td>378,302</td>
<td>40,000</td>
<td>15,161</td>
<td>5,000</td>
</tr>
</tbody>
</table>

The above table clearly indicates the inadequacy of the annual grants made by the government. The government's antipathy was a cause of great concern to Grierson because he felt that it was already resulting in a substantial loss to the state exchequer because the tenant refused to pay rent if the irrigation works were not properly maintained. His other contention was that the government as a model...
landlord should undertake such repair works so that private landlords could emulate.

Along with the growth in population and emergence of market in land other changes were also taking place. The improvements in the communication network and the general development of trade and commerce were marked by rise in prices. This led to multiple cropping, particularly in the case of cash crops. Both multicropping as well as cultivation of cash crops required large quantities of water. Hence there was a tendency on the part of a tenant to hold the flow of water for more time than what was originally allowed and to transgress on others' rights.

The decline of the irrigation works had serious implications for the agrarian structure, especially in the produce rent paying areas. In areas such as Patna division the management of irrigation works was closely linked to the existence of produce rent system. This gave rise to agrarian conflict which resulted mainly from the sharing produce. The landlords by virtue of their control over the irrigation work not only claimed rent in produce but a large share

55 General Department, Miscellaneous Branch, August 1879, File No.129, p.11.
which amounted to more than half of the produce while the tenant tried his best to keep this to the minimum. As the rent was fixed, it varied from year to year depending upon the yield. The tenant argued that the landlord was unable to look after the irrigation work and hence he lost his moral right to collect the rent in produce. However, the landlord's position was strengthened by the absence of the tradition of occupancy rights in the produce rent paying areas. He used the ploy of discontinuation of water supply and the threat of ouster from the land effectively to bring his tenants to submission.

Things, however, began to change once the tenants began to assert their rights and to take on the responsibility of managing the irrigation work. Such a change becomes noticeable from the beginning of the 20th century when they started pooling their efforts and to perform the duties hitherto neglected by the landlords. In doing so they unwittingly realised the power of their collective strength.

57 Revenue Department (Land Revenue), Government of Bihar and Orissa, File 29-32, March 1912, p.6. The inducement to increase rent came from the prevailing high prices from 1910 onwards. It led to rackrenting on such a large scale that these even attracted the notice of the civil courts. The landlords' efforts were confined to extracting higher rent only; they even wanted to convert cash rents into produce.

58 J.F.W. James, op.cit., p.40.

It was this unity of purpose and interests which laid the foundation for the peasants' solidarity and found expression in their struggle for commutation of rent from kind to cash in the 1920s. The issue was one of converting rent from kind to cash. The rising price index during the First World War was a strong inducement in this direction. Produce rents, which were fixed arbitrarily, were proving to be very exorbitant. The manner in which tenants' unity was achieved can be deduced from a few commutation cases of the 1920s cited below. These are proof of the growing awareness amongst the peasants of the need to combine and become self-dependent in terms of means of irrigation.

The first case is from village Bhoori and Khora in the Tikari Police Station. The enquiry made by the district officer showed that the channel which carried the water to the villages from the Burh river was in a bad shape. The entire length was two miles. It was repaired by the tenants at the cost of Rs 1,600. They also erected a dam across the river Morhar at a cost of Rs 1,000. But for these measures, the paddy of both the villages would have failed. The tenants concerned, after carrying out those operations,

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51 Ibid., p.23.
52 Ibid.
sought private commutation from the landlord. The landlord had been very considerate. He stopped realising rent in produce and the matter was settled amicably without any friction. The tenants seemed to be very alive to their rights. On being asked what would they have done, had the landlord refused to undertake the payment of money spent on irrigation, they expressed their desire of taking the matter to the court.

In another case enquired into by the district officer in all the four villages of the Tikari Raj in 1924, the tenants had taken upon themselves the work of maintaining the irrigation system by spending money from their own pockets. They knew that the landlord was legally responsible for making good the amount spent by them, and as a matter of fact they were assured by the landlord's amenities that the amount would be reimbursed. In certain other villages not belonging to the Tikari Raj, we notice the same tendency among the tenants to take upon themselves the maintenance of irrigation works. It was again noticed that the tenants were very much conscious of their rights. They were well adept in the art of thwarting any unjust move on the part of the landlords. They would withhold the payment of rent as a lever to compel the landlords to pay for the

63 Ibid.
64 Ibid., p.19.
irrigation expenses. In some villages tenants loudly said that they would make the landlord pay through the civil court if these were not settled amicably.

The degree of success or failure of the tenants against the landlord depended on two factors: their material strength and their caste affiliation assuming that there was a close corelationship between caste and class. There was a distinct bias against the poor on the part of the British authorities who in any case did not want to encourage commutation for fear of displeasing the landlords. They made it clear that all those tenants who were not capable of maintaining or contributing substantially towards the maintenance of the irrigation works would not be allowed to commute their rents. Applications of the poorer peasants were thus rejected on the ground that they did not have the resources to manage irrigation works on their own. Even if commutation was allowed, the rent fixed was high compared to the rents of those who were rich and influential.

As far as the second aspect was concerned, the tenants of higher castes enjoyed more success because of greater cohesion and articulation of their demand. As one of the district officers mentioned in 1924: "the readiness of the

65 Ibid.
66 Ibid.
67 Ibid.
tenants to help themselves in this way for purposes of maintaining the irrigation work and opposing the landlord, however, is noticeable only in villages inhabited by high castes and fairly well-to-do tenantry, but villages whose tenantry are chicken hearted either on account of poverty or owing to their low social status it was sadly wanting. In case of such villages, I am afraid, there is every chance of the irrigation works being seriously neglected without the tenants being able to do anything in the matter. The preceding statement clearly suggests that the rich and upper caste people were more aware of their interests and could easily combine to protect them. Not only this, such tenants were known to have created obstacles in the collection of fair and legitimate rent. Tenants of higher castes like Babhan, Rajput and Kurmi were not fully cooperating with the landlords by fulfilling their own responsibilities. They would neither try to improve cultivation nor attempt to grow valuable crops. The majority of them were unmindful of their liabilities and were regular defaulters. The onus for the poor shape of the irrigation work could not be put only on the landlords. The tenants of higher castes were also partly responsible for this state of affairs. Under these circumstances, therefore, one is impelled to ask whether the commutation of rent necessarily meant a better maintenance
of the irrigation works and improved agrarian relationship. This is a crucial question concerning the efficiency of the irrigation system, for it casts doubt on the ability of the tenants to look after the system on their own and the extent of benefits derived by the agricultural community as a whole. It may be pointed out that commutation was mostly allowed in cases where the tenant was economically self-dependent because only then he would be able to look after the irrigation works. However, it was generally noticed that once the tenant got respite from the oppressive rent through commutation, he became complacent towards his obligations. According to the new arrangement made in 1923 in the Patna division, the construction of village and field channels was the responsibility of the tenants whereas the major channels arising from the river were to be looked after by the landlord. After the commutation took place both seemed to have lost interest in irrigation works. The landlord did not have any incentive because he was no longer in a position to force his will on the tenants to get maximum rent. They were not going to receive any extra payment for their efforts. The small landlords in particular suffered most under these circumstances because they were not left with enough resources to look after the irrigation work. The tenants too had their own reason for losing interest. The rich were rejoicing over their triumph. The substantial reduction in the burden of rent gave them an easy time without much botheration. The burden was not so heavy as to
make them realise the urgency of maintaining the irrigation work. The commutation of rent allowed them to take advantage of the rising prices for they had larger marketable surplus than ever before. Moreover, they had security of tenure which had agitated their minds for long. The poor tenants were, however, left to their own fate and the commutation of rent did not make any difference to them, for, with meagre resources, they were least expected to contribute their bit to the upkeep of the irrigation work.

The commutation of rent, by making both the landlord and tenant responsible for the upkeep of irrigation works, created more complications, for responsibility had to be shared by both. Each expected the other to perform his duty first with the result that none discharged his responsibility. As one of the district officers commented in 1924: "the irrigation system is bound to be affected by the grant of commutation. Even if the tenants are able to maintain the irrigation works to some extent, they are not likely to do it with the same efficiency".

The second major drawback of the irrigation system lay in the structure of the pynes and ahars. There was lack of scientific technique and engineering skill in their

70 Ibid.
71 Ibid., p.58.
72 Ibid., p.57.
construction. This made them vulnerable during times of excessive rains or floods. The pynes or channels were mostly constructed by unskilled labourers, unless they were patronised by a big zamindar. The method generally employed was very crude. A large number of wage labourers were mobilised. Lines were drawn without using any proper measurement and then digging started. It hardly involved any masonry work. The entire structure thus seemed to be very fragile because of weak foundation and lack of engineering skill. This naturally led to large erosion of soil when water flowed. It was difficult to control or regulate the inflow of water at the mouth of a channel from the main course of the river due to proper headwork. The constant rush of water tended to broaden and deepen the mouth resulting in the channel of the pyne becoming ultimately the course of the rivers. This not only devastated the standing crop, but also reduced the fertility of the soil. The river water carried both silt as well as sand. As silt was heavier it settled to the ground or stuck to the surface of the channel whereas sand being lighter flowed with the water into the field. After water receded, it left sand deposits

73 L.S.S.O'Malley, Shahabad District Gazetteer, Calcutta, 1907, p.75.
74 Ibid.
75 Bengal Land Revenue Proceedings, May 1890: File 5-6, p.27.
in the field which reduced the water retention capacity of the soil, thereby affecting its fertility. Such large damages also put the entire system into disarray for these required large scale repair works. The vagaries of nature were very aptly summed up by C.A.Oldham, the Collector of Gaya. Talking of the fitful flow of the rivers in Gaya district in 1912 he said: "the channels may get filled for a few days, become almost empty for the next fortnight and then get filled again with a day or two's rainfall and the process goes on". Thus water did not remain in the rivers for more than a few months and the pynes usually dried up before the end of the year.

The system of tank irrigation was also not free from defects. The first defect arose out of their construction which in most cases was done by only raising embankments. These were made of mud and hence could not withstand heavy rainfall. There was a tendency for the walls to cave in during times of heavy rainfall. As the tanks were not dug very deep, even a little bit of silting put the tank out of use. Therefore these tanks required periodic desilting in order to keep them fit for irrigation purposes. In fact

77 Ibid., p.12.
78 Ibid.
tanks had to be constructed afresh every year prior to the
monsoon in order to store water. It was also the normal
practice to use these ahars or tanks as cultivating ground
for paddy after the water was drained. Because such water-
soaked soil when sown with paddy gave excellent result.

Given the defects from which the irrigation system
suffered it was quite evident that it could not provide
security to the crops either in times of a drought or in
times of excessive rainfall. Either way the crops were bound
to get affected. But then the cultivators found a way out of
this tangle by taking to multiple cropping. This was
practised mostly in South Bihar where the famines had little
impact. But this could be practised in areas which had
plenty of water or moisture in the soil. In Tirhut division,
however, the cultivators practised multicropping except
Darbhanga district where they were dependent mostly on rice.
Thus immunity from perpetual famine was not the result of
elaborate irrigation works but that of the multicropping
system.

If structural defects posed problems in attaining the
efficiency of the irrigation system, the uncertainties of

79 Revenue Department (Land Revenue), Government of Bihar
and Orissa, File 55-58, November 1915, p.4.

80 Areas threatened by floods could not practise multi-
cropping especially the cultivation of rabi crops
because these crops were valuable and their loss could
prove disastrous. Such areas were more suited to
cultivation of rice as it requires plenty of water.
supply of water further affected it. It was invariably found that most of the rivers and streams did not carry water throughout the year. Those which did, could not be used for irrigation by simple means. Hence there was no way by which the flow of water could have been ensured in the small rivers and streams. In Patna division the number of such streams was not as large as in Tirhut division. Most of these streams originated from the hills in the south of Gaya district. Unlike Tirhut division which was close to the foothills of the Himalayas, the hills in Patna division did not have much vegetation; it, therefore, attracted less monsoon clouds. Moreover, clouds tended to drift further south in the absence of any natural barrier like the Himalayas in the north. Hence Patna division experienced comparatively less rain than the Tirhut division. The volume of discharge of water, therefore, was less than in the latter. Naturally these streams tended to lose their vitality as they travelled down. This gave unequal supply of water to the areas situated along the course of the rivers and streams especially when the monsoon began to end. Those villages which were situated down the stream always had


83 L.S.S.O'Malley, Patna District Gazetteer, Patna, 1907, p.95.
lesser volume of water as compared to those which were situated up. This became a matter of dispute between the affected parties. In times of poor monsoon such discords became more frequent because those receiving supply tried to accumulate more than what was required and blocked the onward flow of water not allowing the same privilege to the disadvantaged cultivators. Attempts were even made to divert water from the channels illegally.

The problem of supply of water although not so acute in Tirhut division also posed problems to the cultivators. The region was criss-crossed by numerous streams but none proved to be useful during the time when the monsoon failed.

Tanks, like pynes, were also not a perpetual source of water. Although most ahars were brought into use only after the pynes dried up yet the supply of water depended much upon the extent of rainfall. A poor monsoon often led to a very meagre reserve. Loss of water also occurred through percolation and evaporation in a dry climate like that of Patna division.

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84 Ibid.


86 Loss of retention of water depended on the moisture retaining capacity of the soil. Tanks in the Tirhut division rarely went dry because of higher percentage of moisture in the soil contrary to what was the case in the Patna division.
The government was expected to play, and could have played, a more positive role in solving the problems relating to irrigation. Though some of the irrigation works, like the Sone canal in Patna division and Tribeni, Maduban and Saran canals in Tirhut division were the result of the government's efforts, these proved to be quite inadequate in providing irrigation to most. Given the onerous nature of the task, the government was not interested in effecting large scale infrastructural changes. One can notice a direct correlation between the needs of the imperial government and the policies framed by it. Accordingly, public works were geared towards achieving greater efficiency in the realisation of imperial goals. Being out and out utilitarian in content, canal irrigation was aimed at bringing maximum benefit to the state. Without further going into the motives underlying such measures and their merits and demerits it would be appropriate to cite a few examples to highlight the interconnection between the two.

First, we can look into the factors that prompted the British to construct the Sone canal. The entire stretch of land in Patna and Shahabad districts had been a perpetual scene of conflict between the landlords and the tenants.

87 Sometimes it became difficult to distinguish between the government canals and private canals because the latter were nothing but the distributaries of the former. However the ownership and management of the distributaries rested in the hands of the landlords.
While the proprietors wanted to hold on to produce rent, the raiyats wanted a shift to cash rent. The tenants, as a rule, were very powerful and resisted successfully the landlords' attempts to overexact. A dispute always arose, as mentioned earlier, out of private arrangements for irrigation. This posed considerable difficulty in the collection of land revenue to the authorities. Therefore, in order to overcome the difficulty posed by the perpetual conflict in the collection of land revenue, they decided to construct the canal so that the prevalence of harmonious relationship might lead to smoother realisation.

The second reason for the construction of the canal was the fertility of the area and its proximity to Patna, which was the centre of inter-provincial trade passing through the region. This strategic position of Patna needed to be further developed. Patna also had the benefit of two major means of transport, the river Ganga, which was more easily navigable from the high southern banks of Patna division, and the grand trunk road linking the province with Calcutta.

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88 Revenue Department (Land Revenue), Government of Bihar and Orissa, File 29-32, March 1912, p.18. Forged papers were produced by both parties in support of their claims and it became difficult for the government official to ascertain which section of the claimants was less dishonest.

The soil of the region known as the kewal or hard clay was considered to be very fertile for rabi crops if proper irrigation facilities were made. It gave excellent results when irrigated and spelled disaster when the monsoon was poor because kewal soil usually required plenty of water to give good results. And last, but not the least, Shahabad also had the presence of planters, although on a modest scale. They were earlier engaged in the cultivation of sugarcane and then switched over to opium before again returning to sugarcane in a big way in the early 20th century.

There were, of course, several difficulties faced by the administration in undertaking projects involving large finances. It was invaribably found that its efforts were not duly rewarded by the beneficiaries of such schemes. The return of revenue from the two canal works, the Sone and Saran canals, is an outstanding proof of this fact. It was not sufficient to cover the cost of interest on the total capital outlay let alone the recovery of the cost of construction. Even if the government did get some return, it was not commensurate with the investments made in these works. We will take up these for discussion one by one.

90 J.F.W.James, op.cit., p.3.
92 Royal Commission on Agriculture in India, Evidence Volume XIII, Bombay 1928, p.221.
The Sone canal, which had the longest command area, was constructed with a view to providing irrigation water to the entire region of Patna and Shahabad. The government levied a very nominal sum as canal charges. But gradually it began to find it increasingly difficult to claim water rates from everyone who received water. A cultivator was free to take water at a prescribed rate. In other parts of India, the general practice had been that the irrigated field was in itself sufficient to justify the levying of water charges. But rules were different under the Bengal Irrigation Act which declared that no charge could be made for irrigation unless a formal application had been received for water. A penal charge was to be imposed if it was found that water was being taken surreptitiously or illegally but nothing could be charged for what was known as 'involuntary irrigation'. Although, it in no way affected the supply of water because the Sone canal always had a perennial supply, yet pilferage of water in the hot weather did affect the distribution of water especially to those areas which were located in the remote parts of the countryside. As water was mostly scarce during years of poor or low rainfall and from January to March, cases of complaint regarding non-

94 Ibid., p.158.
95 Ibid.
availability of water mostly occurred during these periods. The loss of revenue on account of the nominal water charges did not matter so much to the government as the unsavoury practice of pilferage. The British authorities in order to spread the culture of systematic and organised farming charged very low irrigation rates. As a result it never had any problem in selling its water. The area under long water leases had been steadily expanding. Instead of the party desirous of availing irrigation paying charges season after season they were allowed to avail this facility on a long term basis on payment of a lump sum. During the three years ending with March 1896 the irrigated area averaged 2,71,552 acres but in 1901-02 it amounted to 3,17,318 acres. The rates also increased from Rs 2 to Rs 2-8-0 from 1 April 1897. The increase in revenue had been gradual but continuous. One of the major causes of the loss of revenue was the considerable sum spent on making the canal fit for navigation. But after the construction of the East Indian Railway in 1900 its navigational aspect became almost redundant and there was enormous decline in the return of receipt.

What irked the authorities most was not the inadequate revenue from its irrigation works but the disproportionate

96 Ibid.
97 L.S.S.O'Malley, Shahabad District Gazetteer, p.79.
profits earned by the landlords. The landlords, by virtue of their control over the local channels of water distribution, were able to extract a very high rent both in cash as well as produce, while they paid only one-ninth to one-tenth of its rent collection to the State as revenue. What displeased the government was its inability to get a share in this burgeoning profit. As the land revenue had been permanently fixed, there was no way in which it could have been increased. It was immutable. The landowner paid nothing to the state for the benefits that he derived from the irrigation works constructed at great expense by the government. In a later chapter it has been shown how the landlords tried to raise the rent periodically especially in the produce rent paying areas. Oldham, the Collector of Gaya, cites a case in which an owner admitted that a village which at one time brought him only Rs 3,000 returned him Rs 18,000 per annum after the introduction of the canal irrigation. The logic was the same as in the case of the landlord vis-a-vis tenants in which the landlords were demanding more rent in return for their shouldering the responsibilities of maintaining the irrigation system. The authorities were further apprehensive that any charge levied on the landlord was bound to be passed on to the tenant. Hence the laws needed to be strengthened in order to provide protection to

98 Ibid., p.160.
99 Ibid.
the tenants. However, when it came to action, the government was unable to assert its authority and ensure that the peasants got their due.

Another government irrigation project, the Saran canal system, also did not bear fruits in terms of revenue. The authorities were disgusted with the project so much so that they gave up the management and declared it closed by the end of the 19th century. The Saran canals were in the form of five sluices made in the Gandak embankment. These were mainly constructed to serve the interests of the planters of the district who began to agitate for a canal scheme to save the crops. The works were carried out on an undertaking given by the indigo planters of the district in regard to the economic viability of the scheme. The administration and working of these canals was a failure right from the beginning due to a variety of reasons. First, the flow of water was not regular in all the months of the year, and hence supply was not dependable. It was, therefore, thought unwise to spend more money on the upkeep of the canals. Second, the unpaid administrative staff could not be relied upon. More paid staff was required to stop secret bunding of canals and diversion of water. Lastly, the annual amount of Rs 21,750 paid by the guarantors was not commensurate with the benefits derived by them. The government was a loser to
the extent of Rs 340,000 annually and the guarantee was required to be increased by this amount or other arrangements had to be made to cover the loss.

It was always found that the government's measures were lacking the force of law. For example, the Bengal Tenancy Act of 1859 provided for the granting of occupancy rights to all those tenants who had held land continuously for a period of twelve years. This was applicable to the produce rent paying areas as well. It was a popular measure and could have improved the lot of the smaller tenants. But unfortunately the administration was unable to guarantee this under stiff opposition from the landlords who devised ingenious methods of circumventing it. The degree of success or failure of any measure thus depended on the response of the dominant section of the rural society and the attitude of the State. If it was not acceptable to them, then the State could not press for these reforms. The British in no way were prepared to displease the landlords who were considered the props of the empire. Much that has been written about the overarching nature of the landlord's power at the local level loses its meaning once this point is taken into account. However, in the case of private

101 Ibid.

irrigation, the Indian Irrigation Commission of 1903 in its report deliberated upon the issue and considered the passing of legislation. The primary objects of this legislation were first to ensure that irrigation works were kept up and second to enable government control to be exercised over them so that rights were not infringed or damage caused. The Commission's recommendation in this regard failed to come off.

Thus the problem of irrigation was closely linked to the issue of underdevelopment in the two divisions of the province. In Patna division the irrigation was widespread but the rigid control exercised by the landlord over it led to the depressed condition of the peasants. Due to various economic and demographic changes the landlord's power began to wane and irrigation works started falling into disrepair. The landlords were not prepared to reconcile themselves to the new situation. This led to mounting agrarian tension and the beginning of commutation proceedings. The beneficiaries of these proceedings were mostly the rich and influential peasants. Irrigation in Tirhut division was not a regular phenomenon. The presence of natural moisture in the soil prevented peasants from practising irrigation. This proved to be detrimental because there was no facility for storing water. Under these circumstances in a year of less rainfall or poor monsoon, which did invariably happen, the crops were bound to fail. The government's effort in tiding over the
crisis left much to be desired. Not that it simply failed to initiate projects that would have taken care of the irrigation needs of the vast majority; it even refused to play a positive role by asserting its authority and allowing the existing irrigation works to function properly.