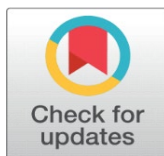


COLONIAL INTERVENTION IN WATER MANAGEMENT: THE CASE STUDY OF DELHI

Ms Anchal¹

¹ Assistant Professor Department of Political Science, Lakshmibai College University of Delhi



DOI

[10.29121/shodhkosh.v5.i6.2024.3894](https://doi.org/10.29121/shodhkosh.v5.i6.2024.3894)

Funding: This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

Copyright: © 2024 The Author(s). This work is licensed under a [Creative Commons Attribution 4.0 International License](https://creativecommons.org/licenses/by/4.0/).

With the license CC-BY, authors retain the copyright, allowing anyone to download, reuse, re-print, modify, distribute, and/or copy their contribution. The work must be properly attributed to its author.



ABSTRACT

In history, wherever the British government established its supremacy, there was a huge change in the ecology due to their policies. Changes in the environment, whether voluntary or involuntary, happened due to their policies. This change in the environment happened slowly, but its effect was felt immediately by the local people. Delhi was under the British Empire from 1803 to 1947 and during this period the ecology of Delhi also changed a lot. Initially, from 1815 to 1911, Delhi went through various ecological changes, after 1912 there was a rapid change in the ecology of Delhi. Delhi's forests, gardens and natural water sources were exhausted very quickly.

Keywords: Ahar, Baoli', Kuchcha, Khadins, Laldiggi

1. INTRODUCTION

Water was an important issue for the rulers in Delhi since the medieval period. In the past, the rulers of Delhi established their capital either near a natural water source or a non-natural water source. Delhi never faced the problem of water scarcity before, but after 1858, Delhi faced the problem of water scarcity, for which the policies of the administration were completely responsible. Before the British, water management in Delhi was completely decentralized. Environmental governance was running very well in which there was full participation of the government and the local people. The British government completely abolished this environmental governance and established its administration in which a centralized system for water management was implemented. Decentralized systems for water management were suitable for Delhi because these practices could not only maintain the groundwater level but also manage rainwater harvesting. This kind of water management was done in the Aravalli areas of Delhi like Mehrauli, Vasant Vihar, VasantKunj, Tughlakabad, Chirag Delhi, etc.

For the British, water was just another resource like other resources obtained from forests or land. Initially, forests and land were more important than water, but soon water also became important to them. The changes in the environment due to their policies have been described by many historians in their articles. This change is well presented in Whitcomb's article "*The Agricultural Condition in Northern India*". He shows the adverse effects of irrigation in India, he shows that how the British introduction of perennial irrigation in the semi-arid plains of north-western India brought adverse ecological consequences such as waterlogging and salinization. The British destroyed the traditional Indian wells and created a canal system. 'The British were proud of having good technology and forced the local people to adopt

new British technologies. However, the British did not do an ecological analysis of the technologies already in vogue before introducing them to India. Ian Stone in his article "*Canal Irrigation in British India*" rightly states that 'In the pursuit of maximum production, canals became a source of economic dynamism and constant innovation,'ⁱⁱ but it also has harmful effects on the environment.

From the medieval period onwards, local water management was entirely in the hands of the village community. Rulers acknowledged local rights over natural sources, but private ownership in water management was also accepted. Many rich people built wells, stepwells etc. along the roads and in the inns at their own expense. Many people had their separate wells, sometimes the wells were built by the ruler, nobles or rich or religious people but they were managed by the local community. The medieval rulers not only protected and safeguarded the rights of the village communities but also got them repaired from time to time at their own expense. For the British, India's natural resources were only a source of revenue. The British not only interfered in water management but also adopted the same policy in other areas. Many scholars highlight the ecological consequences of British water management policies. Imran Ali focuses on the '*British canal management*' and how the British government established a new water system in the semi-arid plains of Punjab. He highlighted how the colonial government continued to destroy India's traditional water management and social institutions. He wrote that 'Thus, a contradictory economic pattern was observed in the canal colonies, in which development was accompanied by environmental damage.'ⁱⁱⁱ In the colonial period, Delhi also faced a schism between traditional or indigenous water management and colonial hydraulic technique. British did not believe in the locals' traditions of water management. The Centre for Science and Environment studied a Delhi-based non-government organization, and presented a report titled "*Dying Wisdom*". This report highlighted an old traditional water management system in India. This report shows that in pre-British India, water was not private property but the British made it private property and used it to extract revenue from it. 'Colonialism, in other words, by instituting private property, commodifying land, commercialisation, pursuing highly extractive revenue agendas and dismantling community control over natural resources caused the impoverishment of the rural populace at large and led to the decay and destruction of indigenous water harvesting system.'^{iv} The colonial government also emphasized the same policy in South Bihar; Nirmal Sengupta tried to find out the reasons for the decline of the local tradition of water management. Sengupta said, 'After the introduction of the new revenue system by the colonial administration, the *ahar* (pond) and *pine* (channel) networks started breaking down.'^v Many scholars have shown that India had a lot of experience in water harvesting. They conserved groundwater in various ways. They collected rainwater in stepwells, reservoirs, L-shaped embankments etc. and used this water for drinking and irrigation. Such water was conserved in Rajasthan, Punjab, South India, Central India, Bihar, Bengal, Delhi etc. Thomas Rosin has written that '*In western Rajasthan*, a series of complex groundwater irrigation and drinking water devices (*khadins* (silt-ponds), stepwells, reservoirs and L-shaped embankments) continued to function and remain viable even in the colonial and post-colonial periods.'^{vi} The colonial Indian government replaced all traditional water harvesting systems with modern hydrological techniques. They introduced dams, barrages and perennial canals and converted many monsoon channels into sewage drainage. Although the area under cultivation increased in the wastelands, it also brought diseases like malaria, and cholera and ecological problems. The British converted many floodplains and channels, which were previously irrigated by seasonal flooding, into canals. Instead, the British built permanent headworks on the river bed with barrages and weirs.

The new policies of the new British rule, which were completely centralised, was a new unexpected event for the people of Delhi, in which people were deprived of their local rights over natural resources. People considered natural water sources as their collective right, but the British government declared it to be the property of the government. And this is where a new kind of water crisis arose in Delhi. Before colonialism, the irrigated area of Delhi was very good, maximum step wells, ponds, canals etc. were used for irrigation and drinking purposes. Nirmal Kumar in his article "Water Problem in Medieval Delhi" has highlighted that in the medieval period Delhi had turned into a huge military cantonment and its population was constantly increasing. The rulers made continuous efforts to meet the water problem of the people of Delhi. He wrote 'The communal nature of social organisation and rather egalitarian society coupled with the scarcity of water led to the adoption of two types of water bodies in the Sultanate period.'^{vii} The water management adopted by the medieval rulers was environment-friendly to Delhi. They adopted a water harvesting system, during the monsoon, they collected rainwater in huge tanks and in times of scarcity of water this was used public. Through these techniques, they maintained the groundwater level and kept the moisture on the land. Step wells and wells play an important role in Delhi's water management. Every village in Delhi had a well. Heritage building activist Vikramjit Singh Rupari has shown in his book '*Baoli*' that Delhi has several types of *baolis*, many of which are associated with religious buildings. These *baolis* are spread all over Delhi and have played an important role in water conservation. In addition, Delhi had two types

of wells, *kaccha* and *pucca* wells. The *Pucca* wells were used for drinking water, while the *Kaccha* wells were used for agriculture. Every locality had its wells, although, many wells were individual property, but most wells were community property. Mayank Kumar has shown in his article "*Settlement, Irrigation and Agriculture in Pre-Colonial Rajasthan*" that digging wells was very popular in India.^{viii} The *Gazetteer of the Delhi District: 1883-84*, mentioned that there are two types of wells in Delhi *Kuchcha* (unconstructed) and *pucca* (constructed) these are used for households and irrigation purposes.^{ix} By 1912, there were countless wells all over Delhi, most of them cemented. A British report in the *Gazetteer of Delhi District: 1883-84* shows that there were about 797 wells in Delhi, of which 675 were privately owned.^x Most of the wells around 600 were in the New City area.^{xi} A Settlement Report of 1872-75 showed that Delhi had around 2,256 wells.^{xii} These statement shows that Delhi had never faced water crisis, even, irrigated areas were also high.^{xiii} A Settlement Report of 1872-75 shows that around 37 per cent area of Delhi was irrigated, which 18 percent irrigated by the canals, 15 percent by wells and 5 percent by bunds and lakes.^{xiv}

From the beginning, these water sources were free for the people but the British government wanted to collect revenue from these sources. For this, it was necessary to establish its ownership over them. Under this plan, the British government discouraged these old traditions to a great extent and by 1912, the contribution of these traditional water sources in the irrigated area of Delhi reduced significantly. In 1912, only about 12 percent of the total irrigated area was irrigated by wells, canals, dams and ponds.^{xv} Delhi had always been a low-revenue area for the British. Agriculture and animal husbandry were entirely in the hands of Jats, Gujjars, Rajputs and some Muslims. They used only rainwater for cultivation, although some farmers also had their own wells and they produced enough produce for their families and the city. The British wanted more production to export, but the problem was that most natural sources of water dried up during summer. In this condition, the villagers used water from wells and local Bandhs (ponds). The villages encouraged the technique of harvesting rainwater through dams. The responsibility of maintaining the dams was jointly of the villages. The British government initially recognized their rights over the natural sources of water; they believed that agricultural production in Delhi could not increase without conservation of rainwater. The British did not want to spend money to repair these resources. Mr. E. Batty, in-charge of Najafgarh Lake, told that there are two big dams in the village named Chhatarpur and Khidki in the Southern Ridge. There are many more dams like this, but most of them are in incomplete and poor condition.^{xvi} There were many dams in Delhi which were as big as ponds and irrigated all the surrounding areas. The settlement report of Delhi in 1872 shows that about 215 acres of area was irrigated by Ambarbai Dam and about 300 acres of area was irrigated by Bijwasan Dam, but all these dams needed more attention. It was a strange situation in front of the people that the British neither repaired it nor allowed the local people to maintain it. The British government argued that this would cause more harm than benefit, however, they did not explain this. It seems that the British government believed that malaria or other water-borne diseases come to Delhi due to these. In this situation, many dams like Khidki, Mahipalpur, Manakpur, Palam, Rajokhri, Sultanpur, Tughlakabad etc. had reached a state of ruin. The British government took a big decision and under an act in 1873, all types of natural water sources were declared the property of the government. All the rights over the dams and canals passed from the hands of the local people to the hands of the British. This was a strange situation, the people wanted to maintain it but they did not have the right to repair it and the British had the right but they did not want to repair it. Najafgarh Lake of Delhi was also an important source of water, it provided moisture to most of Delhi. Mr. Maconachik was the head of the settlement committee of 1855-56, he mentioned in his report that "It is worthy of notice that the estimated area drained by it is 3,072 square miles, and its water surface with a depth of 12 feet at the gauge at Nanak Heri is 56,657 acres or about 88 1/2 square miles."^{xvii} Najafgarh Lake was a large lake which provided water for many gardens and agriculture. In 1857, there was a battle between the British and Indian soldiers on this lake, even at that time it was a lake with a lot of water. No one had local rights over Najafgarh Lake, everyone could use its water for their purpose. Delhi and Gurgaon were irrigated with the water of this lake. Even till 1877-78, the Canal Department which managed Najafgarh Lake describes that farmers were growing many types of vegetables on the banks of Najafgarh Lake. When the colonial government handed over its management to the Public Works Department, this lake turned into a dirty drain. *The Revenue Rate Report of 1877* shows that initially more or less 65 villages were directly benefited by the water of Najafgarh Lake.^{xviii} The Public Works Department took over its management but neither did it take care of it nor did it renovate it, as a result of which the lake soon dried up. Both the departments blamed each other for its condition. The Canal Department proposed to hand over the management of Najafgarh Lake from the Public Works Department to the Deputy Commissioner of Delhi. W.S. Hamilton who was the Finance Commissioner of Punjab also expressed concern over the condition of the lake and showed more interest in the Najafgarh management. He was assured that the Deputy Commissioner of Delhi would take more interest in the renovation of the lake. It seems that this was just an excuse, in reality no one wanted to improve the

situation. Although the British government was getting revenue from the water of the lake, they only wanted the revenue and did not want to spend on its renovation. Gradually silt was accumulating in the lake and the catchment area was turning into marshland. The British government was not paying attention to the maintenance, as a result of which the government's income from the lake was constantly decreasing. However, this Najafgarh Lake was still irrigating around 36 villages, this was important for the British as they did not want to give up the income from the lake.

The British population in Delhi continued to grow since 1803, but most of the British who lived in Delhi were mostly associated with administration and army. They first chose their base in Daryaganj and after the revolution of 1857, they also established British colonies in Civil Lines, Kashmiri Gate etc. They first needed fresh water for the British population, but in 1857-8 many water sources in these areas were destroyed or stopped. Due to this, it was their prime need to arrange clean water in their regions. Mirza Ghalib has drawn attention to the situation of Delhi just after the revolution of 1857. In 1858, Mirza Ghalib wrote 'Here have two roads: Thandi Sadak (Yamuna Road) and Iron Road (Railway Line), both are separate. Apart from this, a barrack for 'Goras' has been built in the city and the land in front of the fort will be cleared, where earlier there was a *LalDiggi* (pond).'^{xix} *LalDiggi*, in front of the Red Fort, was an important tank, from which water was raised using a Persian wheel and sent to the Jama Masjid for wudu (ablution). *LalDiggi* was a small artificial tank covered with red sandstone, but after 1857, the tank was converted into plain land by the British government.^{xx} *Nahar-i-Bahist* was a beautiful canal that flowed through the middle of modern Chandni Chowk. It was built by Firoz Shah Tuqlaq and when it became silted up, the Mughal governor repaired and opened it. The British did not pay attention to *Nahar-i-Bahist*, and as a result, the canal dried up by 1860. However, the canal fed many wells and ponds, besides providing water to many gardens and fields.).

The water of Nahar-e-Bahist was used for the British settlements. Initially, the water of Nahar-e-Bahist was available to all the citizens, but under an act called "Northern India Canal and Drainage Act 1873", the colonial government ensured that water from this canal would be given only to the British colonies. This was the first time that the British authorities deprived the natives of canal water. However, the "*Northern India Canal and Drainage Act of 1873*" gave the British complete control over all the rivers, ponds, canals, lakes, and other natural water sources. They believed that only the British government could build and maintain these sources. Under this act, they had the right to impose tax on these sources. Only the colonial government had the right to repair and renovate them, but they never took care of all these sources. This was a harsh step by the British to isolate all local rights over natural water sources.

However, the colonial government appointed a canal officer to maintain all these natural water sources and gave him all decision-making powers over natural water sources. The canal officer curtailed all the rights of the local people such as navigation, fishing from ponds, and farming on the banks of the canal. Some exemptions could be given only by special permission. Interestingly, the people of Delhi never protested against this act. Despite this act, the villagers were still using water from ponds, dams, and wells, however, they had now given up the responsibility of maintaining these natural water sources. The canal officer gradually established control over all these sources, but this department never showed any interest in the maintenance of local water sources. They were only interested in canals and the Yamuna River. Yamuna River and canals were great sources of income for them and from the point of view of the British the water from wells and ponds was their source of income and not good for their health. They needed only fresh water from the Yamuna River and canals to supply British settlements. To supply drinking water to British colonies, they started a pipeline supply system in Delhi. This had an ecological impact on the natural water sources. All the canals, channels, and Najafgarh lake of Delhi were drying up as the British were not allowing their water to be used by themselves and the people of Delhi. The British were supplying water to their settlements through pipelines carrying water directly from the Yamuna River. Soon many of the canals and lakes of Delhi dried up and the Najafgarh lake which carried most of the flood water to the Yamuna River slowly dried up and turned into a marshland and a dirty drain. The British believed that the new pipeline system was easier and less expensive than digging new wells, cleaning the canals, and renovating the Najafgarh lake. Most importantly, the British government faced difficulties in collecting taxes from these natural water sources because the people of Delhi were not paying taxes for the water from these sources. Water was free since ancient times and they considered it a boon from God. With the pipeline system, the British government could easily levy taxes on water and water could become a good source of income. The real motive of the British was not the welfare of the people nor were they concerned about their health but they felt that people would oppose this act. They argued that the system of supplying water through pipelines was very cheap and many diseases caused by dirty water would not occur. They cited the report of the sanitation officers in 1866 which stated that contaminated water was a major cause of deaths of a large number of people in Delhi.'^{xxi}

The British had started the pipeline water system but it was not becoming so popular in Delhi. Only the rich people and the British people were taking new connections. Due to this, they were getting very little income from water. They found a solution to how more and more people should take new water connections and increase their income. For this, they tried to close the old wells and canals because people were still using more water from wells and canals than pipeline water. People had old tradition and faith on these traditional water sources and their water was part of their culture. The British colonial government was determined to start the water pipeline system in Delhi because Delhi had only one river and no other perennial water source. It was decided that a series of wells should be established near the Yamuna river bed, where water would be drawn from the Yamuna river and these large tanks would be filled with water. For this purpose, a committee was appointed under the supervision of Lieutenant General R. Magalgaon, Secretary of the Public Works Department of the Punjab Government. He had an experienced officer who had already started the water pipeline system in Lahore. The experiment of water pipeline system in Lahore was successful. It was similar to the Lahore scheme started in Delhi. Salimgarh near Red Fort was chosen and new series of wells were installed here as the Western Yamuna Canal flowed between Salimgarh Fort and Red Fort. In Mughal period this canal provided fresh water to Red Fort, but during British period this canal was converted into sewage or drainage. Lieutenant General R. Magellan found that the canal was full of dirt and the water was not fit for drinking. Due to the Water Act, the local people stopped using its water for agriculture and other purposes, due to which the canal gradually dried up. The British never repaired it nor paid attention to its deteriorating condition. Another canal Nahar-e-Bahist passing through the middle of Chandni Chowk also dried up. However, in 1877 Lord Hastings showed interest in repairing this canal, and this work was assigned to Captain Blane. It was estimated that its repair would cost about two and a half lakh rupees.^{xxii}

Another important canal passed through Roshan Ara Bagh, Mithai Ka Pool and Civil Lines. Many gardens got water from this canal but the British neglected this canal too. The British converted this canal into a drain. They did not want to spend extra on these canals. Instead, they were trying to popularize the water pipeline system in Delhi. The British did not want to bear the financial burden of maintaining these natural water sources. They believed that the old water resources could not generate income. There was only one way to generate income from water and that was to popularize the water pipeline system. They campaigned against the old water resources, claiming that the wells of the city were causing many diseases in the city like malaria, cholera, diarrhoea, etc. The work of laying water pipelines was going on at a very slow pace, however, the British made a good effort to popularize the water pipeline system. But the problem was that despite a lot of efforts, people relied more on their wells for drinking water. Although cleaning and repairing wells was a very expensive and tedious task, cleaning and repairing wells was the responsibility of the community, everyone worked together to do the cleaning and repair work so that there was no financial burden on the people.

Delhi's population was steadily increasing, G.S. Morley, assistant engineer of the Municipal Corporation Committee, estimated that Delhi's population had reached 167,000, and the city would require about 3,200,000 gallons of water per day.^{xxiii} He wrote to the Deputy Commissioner of Delhi, 'At present, as per the daily provision, about 16 gallons of water is available per person in the city.'^{xxiv} There was a great need for water for the growing population of the city. G.S. Moreley recommended two places for the construction of new wells for water supply. He believed that water could be lifted from the new wells and supplied to the city through pipelines. Sites were identified for two new wells, the first in front of Qudsia Garden and the second near Idgah Sarai. Later, after survey, it was found that both the places were not suitable for new construction. Both the places were near the canal from which water could be supplied to these new wells but the British found that both the canals had dried up and the renovation of both the canals would be very expensive. Of course, the population of Delhi was constantly increasing and the demand for water was also increasing. Most of the people of the city were not yet dependent on water pipelines. They had their own water resources but the government was not able to supply water even to those who had water connections. They kept looking for new sites. Soon they selected new sites, near Bhojla Pahari and Turkman Bazaar but these too were soon discarded as both were connected to historical sites. Among the new sites, a site near Hindu Ghar and Sabzi Mandi was chosen. But Morley's water scheme did not live up to the government's expectations as both the sites were far from the river and later due to technical difficulties, there was a shortage of water at both the sites. The British government now wanted to be free from this responsibility as it had failed to manage water in Delhi. Finally the Municipal Committee of Delhi decided to take the responsibility of laying the water pipeline in its own hands, but for this scheme they needed a huge amount of money. The Deputy Commissioner of Delhi gave a loan of Rs 9 lakh for this scheme and the Punjab government also gave a loan of Rs 10 to 11 lakh, but this was not enough for such a big scheme. Every agency wanted to reduce expenses, so in Delhi water pipelines were laid only in European or mostly urban colonies from where the government could get revenue. The Municipal Committee also focused only on urban areas, while most of the population lived in villages. The Municipal

Committee also did not learn anything from the previous experiences of the British government. The Municipal Committee also ignored traditional water resources.

The British government was well aware that the population of Delhi was constantly increasing and the need for water was also increasing. They could not meet the water requirement of the increasing population. It was estimated that the city needed about 1,730,000 gallons of water daily. They did not include the rural population in this requirement. The municipal committee also failed to do proper water management. They had many obstacles; lack of funds, unfiltered water was a new problem. The main problem was not regular water supply in the city. Many times, the water pipelines would absorb sand from the trench wells due to which dirty water would come in the pipeline. The Municipal Committee was helpless as it did not have enough money and technology to solve this problem. From time to time the municipality used to demand more money from the government for the maintenance of the pipelines. The government never gave enough money to the Municipal Committee nor did the municipal committee have enough sources of income. Due to a lack of funds, the municipal committee was never able to manage water properly. The British government left the responsibility of water management to the Municipal Committee. The Municipal Committee was managing the funds with great difficulty, but the expenditure on water management kept increasing. The British government built new wells near the Yamuna River to supply water to the city, but after some time they also became unsuitable. In 1894, the chief engineer said that 'there were about 242 wells in Delhi, but about half of them had become unsuitable.'^{xxv} It was estimated that by 1894, each person would need about 10 gallons of water per day, and the entire city would need 173,000 gallons of water per day.^{xxvi} There was a lot of pressure on the municipal committee and the efficiency of the old wells was continuously declining. The Chief Engineer of Punjab reported that by 1893, the efficiency of these wells had reduced by 25% and the water of Yamuna was flowing into these wells only up to 40%. This problem had arisen because the British government had created an ecological imbalance in water management. The old water management maintained the water balance in Delhi but the British had no faith in the old water management. There was an ecological and general problem of siltation between the wells and the rivers. The government was concerned about the decrease in water in the wells. In 1896, C.E.V. Gaumont and B. Parkes submitted a joint report on the reason for the decrease in water in the well ditches. However, they claimed that the water in these wells was decreasing due to the changing nature of the river Yamuna. The British were settling new colonies, the population of the old city like Paharganj, Karol Bagh, Sadar Bazar and many other cities was increasing and the demand for new water connections was also increasing.

However, the income of the government from new water connections was increasing gradually. From 1901 to 1910-11, the first five years the government was in loss from the sale of water, while later the income from water increased steadily. However, the demand for new connections of the water pipeline kept increasing, but the municipality failed to meet the water demand of the city. Another event increased the pressure on the municipality, the British government decided that the Shahi Darbar would be held in 1911. The British government concluded that about two lakh guests would gather in Delhi. There would be a huge demand of water for this purpose. The Shahi Darbar was always a big challenge for the government of Delhi to meet the demand of water. The last Shahi Darbar was successfully concluded, and about 9,00,000 gallons of water was supplied to the Darbar venue. This time, Delhi's population and guests were multiplied and it was assumed that the city would need three times the number of gallons of water.^{xxvii} The Municipal Committee claimed the city will require around 5,000,000 gallons daily for the Imperial Durbar Ceremony.^{xxviii} The transfer of the capital to Delhi proved to be a milestone in the history of Delhi. The new capital attracted new migrants from every corner of the country. The old colonies were already full, and new colonies were built for the newcomers, but with this big change came poor and lower caste people as well. They did not have a home in the cities, they started living in slums, and there were no minimum amenities. The Municipal Committee was already under pressure, when the government understood the situation, it tried to stop the migration to Delhi, and many slums were removed from the city. Karol Bagh, Paharganj, Shahdara etc. had become dense colonies, there was also a problem of water in these colonies; especially Shahdara was getting water from the Eastern Yamuna Canal, but was not getting adequate and regular water from the Eastern Yamuna Canal. By 1921, the population of the city had increased to about 3 lakhs, but most of the existing water pipelines had crumbled and many water pipelines were leaking. Leakage was a big problem, many complaints were being received from people about sewage water getting into the water. Colonies like Paharganj, Chawri Bazar, Jama Masjid, Matia Mahal etc. were the most affected. Deaths were also increasing due to contaminated water. After 1921, Delhi was expanding, new buildings were being constructed but the problem of water remained the same and till 1947 the British government and the Municipal Committee were constantly trying to solve the water problem.

ACKNOWLEDGEMENT

None.

CONFLICT OF INTEREST

None.

REFERENCES

- Elizabeth Whitecomb, *Agrarian Condition in Northern India: The United Under British Rule, 1860-1900*, vol. 1, Berkeley, California University Press, 1972, p. 18
- Ian Stone, *Canal irrigation in British India: Perspective on Technological Change in a Peasant Economy*, Cambridge; Cambridge University Press, 1985, p. 218
- Imran Ali, *The Punjab under Imperialism, 1885-1947*, Delhi, Oxford University Press, 1977, p. IX
- Anil Agrawal and Sunita Narain, (eds), *Dying Wisdom: Rise, Fall and Potential of India's Traditional Water Harvesting System*, New Delhi, Centre for Science and Environment, 1997, p. 31
- Nirmal Sengupta, 'The Indigenous Irrigation Organization in South Bihar', *The India Economic and Social History Review*, New Delhi, p.157-8
- R. Thomas Rosin, 'The Tradition of Groundwater Irrigation in Northwestern India', *Human Ecology*, 21/1, 1993, p. 555
- Nirmal Kumar, 'Water Problem in Medieval Delhi' (edit.) Nirmal Kumar "Essays in Medieval Delhi", Delhi, Research India Press, p. 225
- Mayank Kumar, 'Settlement, Irrigation and Agriculture in Pre-colonial Rajasthan', edit.in Meena Bhargava, 'Environmental: Issues in Medieval and early modern India" Delhi, Orient BlackSwan, 2017, p. 175.
- Gazetteer of the Delhi District: 1883-84, Lahore, Sang-E-Meel Publication, 2000, p.210
- Administer Report of Delhi District: 1912, Delhi, Delhi Archive, p. 215
- Ibid
- Gazetteer of the Delhi District: 1883-84, Lahore, Sang-E-Meel Publication, 2000, p.210
- Ibid
- Ibid
- Ibid, p.211
- Gazetteer of the Delhi District: 1883-84, Sang-E-Meel Publication, Lahore, 2000, p. 108
- Gazetteer of the Delhi District: 1883-84, Sang-E-Meel Publication, Lahore, 2000, p.9
- File No. 79, 1886, Vol I, DC, Delhi, Delhi Archive
- Jaweed Ashraf, *Studies in Historical Ecology of India*, Sunrise Publication, Delhi, 2004, P. 203
- Ran Sharma Avtar and Tewari Madhukar, *Delhi Biography of a City*, Aakar Books, Delhi, 2012, p. 305
- Water Supply, Certain Paper in Connection with the Water, Unpublished report, File No.67/1894, Delhi, Delhi Archive
- H.K. Kaul, edit., *Historic Delhi: An Anthology*, Delhi, Oxford University Press, 1985, p. 187-88
- Water Supply Delhi, Certain paper in Connection with the File No. 67/1894/ Commissioner, Delhi Archive, Delhi
- Ibid
- Water Supply Delhi, Certain paper in Connection with the File No. 67/1894/ Commissioner, Delhi Archive, Delhi
- Ibid
- Extension of Delhi Water Works, 197/1909, Commissioner, Delhi, Delhi Archive,
- Ibid