

Transport and communication in orissa before the Bengal orissa famine of 1866- A discourse

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Abstract

Orissa was occupied by the British in 1803. From 1803 to 1866; the colonial government did not improve roads and communication. It gave priority on strategic and commercial roads. It only concentrated on Jagannath Road and False Point Port for commercial purposes. By the year 1866, 4000 miles of railway were constructed in India. But the same was not extended to Orissa, River Mahanadi was explored for military purposes'. In 1866, Bengal Orissa Famine visited Orissa. In this famine one third of its population were perished. The Famine was aggravated due to poor communication system. Even relief materials could not be transported because of this. So, the Famine commission of 1866 recommended for development of roads, navigational canals, ports and Ports and telegraph.

Keywords: Bengal orissa famine commission, unmetalled road, jagannath road, railway construction, raipur mail road, captain johnson road, balasore port

Introduction

The main objective of this paper is to delineate the development of transport and Communication in Orissa before the Bengal Orissa Famine of 1866. During the period the English people did not attend to welfare of the badly positioned economy of the province, though the province had abundance natural resources, vibrant labor force and long coast line. In spite of all developmental assets, the colonial government concentrated itself on the territorial expansion and commercial exploitation. Transport and communication which opens floodgates of prosperity, did not receive the attention of the government.

The central argument of the paper is that, the neglect of communication by the colonial government brought disaster for the province. Because in the Bengal Orissa Famine one third of her population were perished. The intensity of famine was aggravated by the precarious communication system. Because during the famine relief materials were not transported to famine affected areas. So, the Bengal Orissa Famine Commission of 1866 recommended for development of roads, ports, navigable canal and post and telegraph. These recommendations laid the foundation stone for the economic development of Orissa.

Reviews of Literature

N.N Banerjee's Agricultural District of Cuttack describes growth of transport and communication in Orissa in the 19th century of Cuttack District ^[1]. S.L Maddox's Final Report on Survey and Settlement of Orissa (1890-1900) provides broad coverage on transport and communication in Orissa during the 19th century ^[2]. H.K. Mishra in his book Famine and poverty in India, besides describing economic condition of Orissa. He has also analyzed the growth of transport and communication in the nineteenth century ^[3] K.E Varghese's book on Development and significance of transport (1834-1882), describes the growth of transport system in India during nineteenth century ^[4]. B.S Das's books on Economic condition of Orissa from ancient times to 1833, describes various economic and social problems of Orissa in the

nineteenth century ^[5].

The colonial objectives of road construction in Orissa were "to establish law and order, to overcome the barbarous superstition and custom of natives, to create circumstances under which they would be driven to work at high pressure, to promote commercial exchange, in short, to bring boons of civilization to the people of Orissa." This view from colonial records with regard to roads construction in the Garjat area of Orissa reflects the colonial objective of road construction in Orissa.

Another official report documented by the Commissioner of Cuttack in early 1840 again exposes the colonial objectives of road construction ^[7].

"I consider the opening of roads through uncivilized and jungly countries as the greatest auxiliary of civilization, and the most efficient instrument in putting down rebellion; it should go hand in hand with education, that handmaid of good Government, to the diffusion of which we must mainly look for improving the state of Tributary Mahals."

These two quotations from the British officials confirmed the colonial policy of road construction in Orissa. The military and commercial character of road construction was very much gleaned in the official writings. So road construction never received the priority of the government. The colonial government did not development new roads during early period of rule. It only used the existing roads for commercial and military purposes. The road from South Orissa to Cuttack passed along the eastern shore of Chilika Lake, between it and the sea to Puri and then follow exactly the line of Present Jagannath Road. It was passed through Khurda along the Ganjam road. It was mainly used for pilgrim traffic to Puri ^[8].

Other pathways started from Khurda and Puri passed through Barmul pass and connected central provinces via Sambalpur. It was unmetalled and fair weather road and only used for cart traffic. Proceeding northwards the road from Puri passed through Cuttack, Padmapur, Arrackpur and Barambardha to Jajpur and then to Bhadrak through Dhamnagar ^[9].

The pathways from Nilgiri and Mayurbhanja passed through dense jungles infested by tigers and other wild animals. So roads were unsuitable for travel by carts and other vehicles. Similarly it was insecure due to presence of animals and dacoits^[10].

The Construction of Jagannath Road-The First Colonial Project of Road construction-

The construction of great Jagannath Road started in 1811 by the British Government^[11]. It was main commercial and strategic life line between Orissa and Northern India. In October 1812 Captain Sackville was appointed to superintend the work^[12]. He was empowered to work from the river Subarnarekha to Puri. Complaints regarding obstructions were common by the local people. According to G Toynbee, the raiyats in the neighborhood of Bhadrak commonly indulged in the practice of cutting the road in order to allow escape to the water. For convenient of the travelers *Sarias* were constructed at Rajghat, Basta, Balasore, Bhadrak and Akhoyapada along the line of trunk road. The metalling of this road was not completed for forty years and soiling was insufficient. Owing to this fact and cutting down of this budget provision it had fallen in to despair. Between Balasore to Soro where the traffic was heaviest, it was impassable for carts during the rains.

This road had three important functions,; (a) as an important road for military communication, (b) as a means of trade route (adding sooner or later to the colonial government to the colonial government's income by raising agricultural output in a region like the Cuttack Division) and (c) as a safe pilgrim route (economically of limited but instant earning power since pilgrim tax still contributed to British revenue from Orissa. Yet Bengal Commissioner Buller in 1809 had thought that that required expenditure was "unreasonable" if conveyed by government fund alone and therefore explored the eagerness of rich men of Bengali to contribute to a subscription^[13].

Raja Sukhomoy Roy, an absentee zamindar or farmer of Orissa, living in Uttarpatha (Calcutta), offered to donate a large sum of Rs150, 000 for construction of this road under specific conditions^[14] The more importance of these conditions were first, that no further private contributions would be accepted so that he would be the only Indian benefactor, second, his donation would be recorded by inscription on all bridges in Bengali, Sanskrit, and Farshi. The third was special recognition would be granted by descendents. The same Raja declared his willingness to undertake a major benevolent work before his death. Realizing that such huge amount of money would not be expected from other wealthy Bengali people, the colonial government quickly accepted the offer of Sukhmoy Roy^[15]. Further, the public works in Cuttack Division clearly stated the Jagannath Road established from a donation by Raja Sukhmoy Roy. Moreover, the road paid for itself to some extent. From 1810 to 1830, the net profit from pilgrim tax amounted to Rs 130,000 (about Rs 6,500 per annum.)^[16] In 1850, Henry Ricket gave further information on precarious condition of the and slow travel on this road^[17]

The Jagannath Road was unmetalled and unbridged. It was raised throughout from six to twenty feet. The road was developed in two phages. A number of bridges were constructed across numerous water crosses. Between 1813 and 1825, the section from Midnapur to Balasore and Bhadrak to Cuttack and Puri were constructed. In Cuttack Division of the Bengal Presidency, it was 287 km long. It moves away from the place of the former pilgrim road from Bengal only in some division where it kept closer to the western border of the Orissa plain.

In early colonial period imperial interest was not favorable for investment in road construction. But military necessity forced the colonial authority to invest in road construction. Moffat Mills, the Commissioner of Cuttack of early 1840 commented that, Roads were "death blow to rebellion". He believed that the suppression of Khurda uprising of 1818 would have taken three months rather three years and would have been much cheaper if present Orissa Trunk Road had been constructed at that time. Such arguments convinced, at times, even East India Company's Court of Directors who directed their subordinates in 1838 that the Ghumusur uprising continued for long time because of unawareness of local condition and for want of roads^[18].

T.E Ravenshaw, the Commissioner of Orissa, warned his authority about the grave security danger in case of neglect of road repairs. Ravenshaw's statement emphasized that even military necessity did not enforce road construction. It has been pointed out that even strategic roads were hardly kept in regular repairs by colonial authority^[19]. For example a bullock cart track between Ganjam and Sonepur via Kalinga Ghat and Shankarakol was opened out in 1852. It was partially bridged by a detachment of Madras army. Traders who travel the difficult and increasingly important salt routes between central India and Ganjam immediately took to this improved road. It was held that about 20,000 pack bullocks walked along this road in first year of its existence. Again this road became not viable because of timely maintenance. So, this road soon became almost unfeasible as before^[20].

The Bengal Government tried to repair the Jagannath Road in 1861. But financial scarcity delayed its plans. The flood in subsequent years caused considerable breaches and encouraged in December 1861 to sanction for repair and construction of roads. Again in 1863 a complete plan was submitted for remodeling of the Cuttack trunk Road, from Rajghat to Cuttack, a distance of 131 miles^[21].

The importance of Jagannath Road and necessity of making it a first class Imperial road was for the first time recognized by the Govt. of India. The great importance of Trunk Road both as an imperial and local point of views recognized the line as one of the main road of Hindustan, a road that should be rank as first class communication, assimilating the character and soundness of construction to the Great Trunk Road, Rajghat to Cuttack, forms a part. So plan was submitted to the Government to repair and reconstruct the road from Rajghat to Cuttack. The entire amount of estimate was Rs.6, 76,264^[22]

Table 1: (Budget estimate for Construction 1865)

Section and Sub sections	From	To	Earth working and trafficking (Rs)	Bridges (Rs)	Causeways (Rs)	Other works and contingencies (Rs)	Total (Rs)
A	Rajghat	Balasore	45,334	1,65,334	993	-----	2,12,119
B	Balasore	Bhadrak	48,160	60,096	-----	-----	1,08,256

C	Bhadrak	Vaitarani	38,580	1,09105	16,138	-----	1,63,823
D	Vaitarani	The 26 th mile post	32,213	70,232	6,107	9,853	1,18,705
E	26 th mile post	Mahanadi	32,705	37,163	---	3493	73,361
Total			1,96,992	4,42,388	23,538	13,346	6,76,264

While construction work was in progress the Governor in council on 28 October 1865 sanctioned the extension of the Cuttack Trunk road to Madras boarder, a distance of 75 miles in order to connect the seats of two presidencies. The total estimated sum for this work Rs.1, 33,000. For metalling of this road the Secretary of State on 18th extended his approval. The exact position of the road was at the beginning of the road was as follows: ^[23]

Table 2: The exact position of Cuttack Trunk road in Feb 1866

Roads	Exact position
Calcutta to Midnapur	Total distance was 73 miles which was already metalled and bridged
From South of Midnapur	About 12 miles of road had been metalled
From River Vaitarani to Cuttack	The mettal work of 43 miles of road had been completed
From Subarnarekha River to Vaitarani river	88 miles of earth work was in progress.

Source: PWD/CW. Communication, Prog. No 27, Memo by the GW Armstrong, Superintending Engineer, and Cuttack circle, 10 January, 1866, Prog. Of January, 1866

The second important road was Raipur Mail Road. In early eighteenth century East India Company wanted to establish shortest postal communication between Calcutta and Bombay. This road passes through Garjat states of Sambalpur, Bamra, Bonai, Pal Lahara, Mayurbhanja and Keonjhor ^[24]. The colonial authority clarified that main objective of this road was to establish reliable postal communication between two presidencies headquarter. But no fund was provided for regular preservation and repair of this road. But the Commissioner of Cuttack and the Superintending Engineer of Cuttack circle stated that the commercial importance of the road would have been much greater if it had been aligned towards Balasore and not towards Midnapur. Lastly, the costs on the preservation of this road was reduced to a minimum as soon as new lines of postal communication between Calcutta and Bombay was established via Mirzapur and Jabalpur in 1853 ^[25].

In 1803, after the British occupation of Orissa, the Captain Johnson road was planned to connect Midnapur and Sambalpur. But this important commercial road was not properly repaired and preserved. So, another important commercial road between Midnapur and Nagpur was surveyed and constructed between 1837 to 1846 at a cost of Rs 493, 284. It had a distance of nearly 1,000 Km ^[26].

There was not a only mile pakka or metalled road in Orissa in 1864. Even the maintenance of Trunk Road was not regularly provided for, though repair had to be undertaken on an annual basis as soon as monsoon rain came to an end and roads cartable during the dry season. The funds available for this purpose were not available in spite of the fact that labour cost was reduced ^[27]. Henery Ricket, in 1850 gives glowing account of the upsetting condition and monotonous tardiness of travel on this road. He further pointed out that no development of this road was executed within the twenty five years of experience ^[28]. So, the Engineer of public work in Bengal Presidency put on

evidence in 1861 “the Imperial Trunk Road between Rajghat and Cuttack... has been left in an extraordinary state of dilapidation increasing year by year.” Even major breaches of the road embankments that had developed during the floods seven years earlier were not repaired ^[29]. So before the outbreak of famine in 1866, apart from provincial roads, there were 99.2 miles of District Roads in Balasore district which were unmetalled and unbridged. In Cuttack District there were 80.00 miles of District Roads. In Puri District there were 74 miles of District Roads ^[30]. If we assess the record of British Government during this 54 (from 1803to 1866) years of rule in Orissa, we came to know that performance of road making and development was unsatisfactory. The main attention of British Government was concentrated on Trunk road. Military and commercial consideration prompted the British Government to construct this road. Other road did not receive the attention of the Government.

The Colonial Apathy to Railway

The railway construction was one of the major investment program of colonial India. The paper seeks to argue that Orissa which was one of the background regions of India did not receive colonial priority for extension of railway. In 1803, Orissa was occupied by the British. The Bengal Orissa Famine of 1866 visited Orissa in 1866 in which one third of its population were perished. Backwardness of communication was one of the potential factors for aggravation of famine. In the 19th century, 12 famines also visited Orissa and there was high mortality rate. Entire 19th century, the area remained propensity to famine and disease. In spite of high mortality, and spread of different diseases in Orissa, the British did not extend railway to Orissa. We want to further argue that the British claim of promoting railway as famine protecting line was not applied here because this backward region did not receive colonial priority. Railway was extended to Orissa only to fulfill the imperial agenda of connecting two imperial headquarters between Calcutta and Madras ^[31].

The first reference to the railway development in colonial Orissa was submitted by Stephenson’s 1845 draft. It prepared a impressive plan for Indian railway system that included Calcutta- Madras railroad along the east –coast of India and thus across the coastal district of Orissa. But when Dalhousie prepared his famous minute of 1853, it considered Orissa coastal line as superfluous and its construction was repeatedly postponed until the 1890 ^[32].

When communication was precarious, the Bengal Orissa Famine of 1866 visited Orissa. In this famine none third of her population were perished. A Famine Commission was constituted to look in to causes, affect and recurrence of similar catastrophe in future. The Famine Commission recommended for development of roads, Ports and making the canal navigable. But it did not recommend for railway constriction in Orissa ^[33].

Again in 1865, Messers. Doyle & Co, submitted a proposal to Lieutenant Governor of Bengal for the authorization to run a line on Traction Locomotives Engines, with wagon or springs, for the passenger travel on the Midnapur Government Road between Ooloobariah (near Calcutta) and Balasore. They planned to extend the same railway line to Cuttack eventually ^[34].

Further in 1866, there was also appeal by the people of Cuttack for the building of railway line between Howrah (Calcutta) and Puri. This demand repeated by Abdul Ghani, a Zamindar in Bhadrak and Balasore, before the famine commission on 1867 ^[35]. Yet the Collector and the Commissioner of Cuttack, in 1868, stated that no railway was necessary in Orissa for the time being ^[36].

The rejection of railway scheme in the years preceding the famine pre conditioned the reorganization of Orissa, social space in subsequent decades on the improvement of its rivers and the Promotion of inland navigation. Though no major canal works were accomplished previous to great Orissa famine of 1866, the main decision than taken generated the restriction of colonial transportation policy in this region up to the ending of the century ^[37].

In marked difference to other regions of British India, the colonial government gave priority not to canals but to broad scheme of partly navigable irrigation canals. Started by a British Joint stock company, this project was taken over by the state in 1869 and continued to absolve much of the resource the colonial regime was prepared to invest in Orissa's built environment. Prioritizing canals thus means postponing railway construction for decades and thus reducing the scope for roadwork even further. Moreover, since the Orissa canals never yielded the proposed financial returns, this priority resulted in a further intensification of regional disparities ^[38].

Colonization of Ports

Orissa has 529 km. long coastline. It is extended from the river Subarnarekha in the north to the Sunapur port in the south. The entire coastline is spotted with ports and harbor and played a leading role in the marine history of Orissa. The most important port were Subarnarekha, Saratha, Chhanua, Blasore, Laichhanpur, Churamoan, Dhamra, Chandballi, False Point Port and Puri. After the conquest of Orissa, The colonial government used the port for profitable purposes for export of natural resources but did not spend any money for the development of ports. The European factory records, the accounts and diaries of European traveler's and agents provide valuable information regarding the maritime transport of Orissa.

The commercial ambition was also reflected in A Hunter's remarks, "true to our national character we settled in Orissa as merchants long before we made our appearance as rulers" ^[39]. One of the original marine settlements in India was set up at Hariharpur in Orissa in 1633. At Balasore in the river Burhabalanga and at Pipli in the river Subarnarekha other factories were established. These two Orissan harbours write Hunter, shaped the basis of our future greatness in Bengal ^[40]. The British Factory at Balasore developed into a thriving center of maritime trade. In 1670 of the several factories in Bengal, Bihar and Orissa, Balasore was the seat of their chief and his council. The ascendancy of Balasore as a commercial center sustained for a long time.

The sloops and vessels used Balasore, Dhamra and Churamon in Balasore district in the first quarter of

Nineteenth Century. The main British concern was easy and safe transportation of their men and treasury between Calcutta and Madras via Balasore ^[41]. Of course, moderate transportation of goods like rice and salt were carried on in the sea in the name of Coastal trade. They were, therefore, obliged to look after the river or sea ports, boats and ships besides the persons employed in such places for the said purpose. Beach Establishments were existing for long time from the Cape Camorin to Ganjam- the Southern and Northern limits of the Madras Coast on the Eastern side of the Indian Peninsula.

In the province of Orissa, Beach Establishment was instituted in 1819 from similar motive of humanity and thus continued the chain from Ganjam to the entrance of the river Hoogli. This Orissa Coast where traffic was so profitable, it was hoped, the beach establishment could in the manner to be continued and entertained without a part of the expense falling upon the Government ^[42].

The Court of Directors approved the appointment of John Mallet as the Beach Master of Northern Division in June 1820 ^[43]. Similarly, for the Beach Establishment on the Southern Coast of Cuttack, Lt. Minchin of the Bombay marine was nominated to be the Master Attendant of Manikpatna. In addition to them, the salt Agent and the Collector of Cuttack were nominated as the member of a committee for the control and superintendence of the Marine Establishments.

In 1822, the Maritime Board deputed Lt. Briddle, pilot PG Sinclair and S Sweeting to round along the coast between Balasore and Dhamra River. But all of them reported that there was no anchorage between these rivers for ships to take shelter during the monsoon ^[44].

In 1828, a light house was constructed at the port of Palymiras. Another lighthouse was subsequently constructed at the mouth of the Mahanadi. The anchorage at False Point was hardly known to the navigators. After loss of two ships during the storm Mr H A Harrison, the Asst Collector of Cuttack, recommended not to use of that anchorage so that ships might not be lost near the false Point anchorage ^[45].

So the port of Orissa did not receive appropriate consideration of the Govt. In 1866, Orissa was visited by a famine in which one third of its people perished. It was most intense and desolating in character. The famine commission of 1866 remarked that the "famine in Orissa stands almost alone in this, that there was almost no importation and the people, shut up in a narrow province between pathless jungles and impracticable seas, were in the condition of passenger of a ship without any provision." ^[46] The seriousness and mortality of the famine presented the grave fault of the Bengal administration and regrettable neglect of the fundamental problems with regard to the development of Orissa.

The need of good port in the Orissa coastline was one of the main causes of the famine of 1866 ^[47]. The existing ports were not suitable for use. In the South East monsoon, steamer could not ground cargo on the surf compressed shoreline. So the rice could not be imported in huge scale through the ports during the disaster to provide relief to the famine suffering people. Further, they were unreachable to the ordinary European boat. For such vessels, there was no sheltered dock of any kind. Moreover, it did not afford any bay to the interior for the Indian Ocean going vessels. At any other part of the seashore, big vessels were to lie in

open roads. Dhamra port, however was capable of receiving 12 to 14 ft of water even at the worst season of the year, provided they come in with the help of watercourse^[48]. Even though all district had its ports, until the outbreak of famine, they never fascinated the notice of the Government. After the famine of 1866, these new ports were improved and also opened to provide communication facility.

Colonization of Rivers

The company government also colonized rivers of Orissa. The Superintending Engineer of Cuttack inspected about 450 Km of the Mahanadi river in 1861. He finalized that its stony bed extending over more than 200 km could never be safe secure for water transport^[49]. This river's significance as a waterway of inter-regional commodity circulation with Central India was observed by officials at once after the occupation of Orissa^[50].

In 1868, Richard Temple, officiating Chief Commissioner of Central Provinces, carried out another survey along the Sheonath and the Mahanadi River. He submitted a detailed report. It consisted of a complete system of excavating an inland waterway parallel to the left bank of the Mahanadi. It further planned to create reservoir for excess water during monsoon, which could be used for irrigation during dry season. For this propose 418 km of river had to be improved. It cost was estimated at Rs 3.5 million. Richard's main objective was to create a cheap and easy highway in the midst of irregular and rough country in order to promote the export of raw materials from central India such as cotton, sugar, food grains, iron and timber^[51].

Several factors contributed for the failure of river navigation before the Famine of 1866. Rocky River bed was not suitable for river navigation. The colonial government did not invest huge amount of money because of poor commercial prospect. The geographical location of towns like Cuttack, Sambalpur and Binika rivers by the side of the Mahanadi River were not explored^[52]. Lastly, the commercial prospect of the Rivers like Subarnarekha, Burabalanga, Rushikalya and the Mahanadi were not explored^[53]. The colonial government adopted an apathetic attitude to the rivers of Orissa.

Conclusion

Thus to sum up, the British government after the conquest of Orissa in 1803, did not develop a clear vision on development of transport and communication. Its main priority was to use the existing roads and ports for commercial purposes. Guided by same objective, it did not introduce railway in Orissa prior to the famine of 1866. The precarious condition of communication came to limelight when famine of 1866 visited Orissa and one third of her population were perished. During the famine, the relief material could not be transported in to the famine affected people of Orissa. So the famine was aggravated and one third of her population was died without food. The colonial politics of road construction in pre famine 1866 period Orissa were thus characterized by periodic, unsustainable and often short lived efforts to generate cheap channels for traversing the region for purpose of military as well as administrative communications and by 1860 draining off strategic raw materials

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References

1. Banerjee NN, Agricultural District of Cuttack, Calcutta, 1898, 48.
2. Maddox SL, Final Settlement of Revision Settlement of Orissa, 1890-1900, Calcutta. 1900; 1(2):89.
3. Mishra HK Famine and Poverty in India, Asish Publication, New Delhi, 1991, p65.
4. Vergeese HE. evelopment and significance of Transport in India,1834-1882, New Delhi,NV,1976.
5. B S Das, Economic History of Orissa from Ancient Times to 1833, Calcutta, KLM, 1978.
6. Temple, Richard, Report on the Mahanadi and its Tributary: the Resources and Trade of the adjacent countries and Proposed Works for the Improvement and Navigation and Irrigation.... In Selection from The Records of the Government of India, in the Public Works Department, Calcutta: J hiron, PWD Press, 1864, 43.
7. Moffat AJ. Mill's' Report on the Tributary Mehal, in Papers on the Settlement of Cuttack, 67
8. Malley LSSO. Bihar and Orissa District Gazetteers, Puri, Patna, 1929, 215.
9. George Toynbee, A Sketch of History of Orissa from 1803-1828, Calcutta, Bengal Secretariat Press, 1873, 78.
10. Ibid.,p79
11. LSSO' Malley, Bengal District Gazetteers, Balasore, 1908, 42.
12. Ibid.,p42
13. BoRLR OSA. 17,204 (C. Buller,Co CD, to Lord Minto, Governor – General, 1809.
14. Das BS. Economic History of Orissa, op cit, p 36
15. OIOC. Oriental an India Office Collection Board's Collection F/367, no 9206. A Leading representative the East India Company commented this benefaction in the, 1830.
16. Nancy Gardener Cassels, Religion and Pilgrim Tax under the Company Raj, South Asian Studies, 17New Delhi, Manohar, 1988, 164.
17. Henery Rickett. Reports on the District of Midnapur and Cuttack,83-84;Ricket Reports on the District of Pooree and Balasore, 23,69
18. Letter by A. J. Moffat Mills, CoCD, June, in History of the Rise and Progress, 85Also see Moffat Mills report on the Tributary Majhals, in Papers on the Settlement of Cuttack, 1844, 67.
19. OIOC BPWP February Com, no22-26, (TE Ravenshaw, Report on Cuttack- Sambalpur Road, 1873, 200.
20. OIOC, BPWP 1860, P/16/41, Com., 102,443) E H Harington, Acting District Engineer, Ganjam to CEPWD, 1859
21. P.W.D/ Civil Works Communication prog No 57, GM Armstrong, Chief Engineer of the Government of Bengal, 16 December 1863, Pros of, 1865.
22. PWD Pros. From Lt Col. JET Nicolas, RE off Secretary to Govt of Bengal in PWD to Secretary Govt of India, P.W.D (No 56), 1865.
23. PWD/CW. Communication, Prog. No 27, Memo by the GW Armstrong, Superintending Engineer, and Cuttack circle, 10 January, 1866, Prog. of, 1866
24. Toynbee G. A Sketch of History of Orissa from 1803-

- 1828, Calcutta, Bengal Secretariat Press, 1873, 84.
25. OIOC, BPWP, GF Cockburn, CoCD, to SE, 3rd Circle, 1859 and no.15,200 (River Thompson, Junior Secretary to GoB, to Offg, C. E. Lower Provinces, 1860.
 26. National Archives of India, Military Board to Governor General, 1 Secemder1841.J Johnstone, Special Assistant in Keonjhor, to CoCD, 10Aug,1869, and other relevant document,
 27. Ibid.
 28. Henery Rickett Report on the Midnapur and Cuttack, pp 83-84.
 29. OIOC, BPWP August 1861, p/16/53, Com., no85-7(memo from J.P Beadle, Offg, Chief Engineer, Bebgal, 1861.
 30. A Report on the Imperial and District Roads in Bengal Presidency, Calcutta, 1866, 192.
 31. 31.Ravi Ahuja, Pathways of Empire, op cit,p255
 32. Dalhousie, Minute to the Court of Directors, 20th April, item. 1853; 174(2):42-43.
 33. Nayak G. Railway Transport in Colonial India, A Study of Extension to Orissa, Railways in Colonial India, Edited by Ganeswar Nayak, Manohar Publication, New Delhi, 2020, p341.
 34. The proposal was discouraged by the CoCD TE Ravenshaw and consequently turned down, Ref-OIOC< BPWP, 1865 p/16/, 7224-27,14-16.
 35. Report of the Commission Appointed to Famine in Bengal and Orissa1866, 1XCIC (statement by Abdul Ghanee, 22January), 1867.
 36. Orissa State Archives, Bo RLR, W Macpherson, Collector of Cuttack, to TE Raven shaw, Co C D,30 March 1868; Paper relating to Extension of Railway Communication in India, reprint 14 of PWD records, Calcutta, PWD Press, 1868.
 37. Report showing Progress Made in Public Works under the Bengal Government for 1861-62,111 (T Armstrong, SE Report on Cuttack Circle), 1862.
 38. Ravi Ahuja, Pathways of Empire, Circulation, Public Works and Social Space in Colonial Orissa,1780-1914, Hyde 3 rabad, Orient Black Swan, 2009, 223.
 39. The Journal of Bihar Orissa Research Society, Para3-4, Medieval Orissa Sea Ports: Balasore, p147-48, Proceedings of Indian History Congress, 14th session, Jaipur, Shipping and Maritime Activities of Orissa during the Muslim Rule, 1(30):127-76.
 40. WW Hunter, History of Orissa, London,1872, 37
 41. Orissa State Archives, Acc No, 11B, Report of J Mallet, Master Attendant of Balasore, May, 1829, 149.
 42. Nayak G, Development of Water Transport in Colonial Orissa, Post-Doctoral Thesis Submitted to Utkal University, 2006, 2.
 43. Report of the Administration of Custom Department of Bengal Presidency, 1874-75, Sec-V, Para 97, Bengal Revenue Proceedings, 1875.
 44. Secretary to the Commissioner to Cuttack 10 Sept 1819, BRP, 1817, 1822.
 45. HA Harrison. to Commissioner, Cuttack, Bengal Administrative Report, 1858-59, 76.
 46. Bengal Orissa Famine Commission Report. 1866; 1:17.
 47. LSSO' Malley, BDG, Balasore, Calcutta, 1910, 42.
 48. Report of the Administration of Custom Dept, Bengal Presidency, Section V, Orissa Ports, Bengal Revenue Prosm, 1867.
 49. Report Showing Progress Made In Public Works under the Bengal Government for 1861-62, 111(T Armstrong, S.E Report on Cuttack Circle), 1862.
 50. Nayak G. Water Transport in Colonial Orissa, A Study of Rivers, Proceedings of Indian History Congress,76th Session, University of Gour Banga, Malda, 2015,383.
 51. Richard Temple, Report on the Mahanadi,34-39
 52. Nayak G. op cit,395
 53. Ibid,,395