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Energy in Indigenous Industries:
Re-considering the Decline of the Salt Industry
in Mid-nineteenth Century Bengal

Sayako Kanda *

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* A 21st Century Center of Excellence Project Postdoctoral Fellow , Keio University

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Sayako KANDA

saykanda@xa2.so-net.ne.jp

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Introduction

The salt industry in Bengal, one of the key industries of coastal Bengal, had declined by 1860, except for Chittagong and Midnapur Districts. Previous studies have attributed the dislocation of the indigenous salt industry in Bengal to the following factors: the monopoly of the English East India Company (hereafter the Company) from 1772; the pressure from the salt and shipping interests of Cheshire and Liverpool; the influx of Cheshire salt from 1845; the British imperial policies.¹ Therefore, the decline of the salt industry in Bengal was seen as a typical example of ‘de-industrialisation’. Figure 1 shows a surge in imports from Great Britain from 1845 (Cheshire salt) due to the modification of customs duties. But records show that there had been large salt imports before the rapid increase in imports from Great Britain. The problem of this theoretical framework is that the industry’s decline has been discussed only within the economic and political relations between Bengal and Britain, ignoring the indigenous economic, political, cultural and environmental factors surrounding the industry and trade.

Bengal’s salt imports on the private account began largely after the cessation of the trade monopoly of the Company in 1834, mainly from West Asia (Persian and Arabian Gulfs) and Bombay. More important was that Bengal had been importing salt from the Coromandel Coast and Orissa from the late eighteenth century (see Figure 2),² which amount was, however, excluded from the trade statistics as they were treated as ‘a source of revenue’ of the Company. This was one of the main reasons why the ‘importation’ of salt has been ignored in historical studies, even though Coromandel and Orissa salt occupied about one fourth share in the total supply of salt in Bengal and Bihar³, and their share was on the increase from the mid-1820s.

It is necessary to consider the fact that the salt market consisted of several varieties of salt in order to explain the decline of salt production in Bengal. This paper strongly suggests that Bengal salt had become costly and less competitive long before the influx of Cheshire salt. Bengal salt became unable to compete with Coromandel salt in terms of price and with Orissa salt for quality. This was brought about by a combination of factors—fuel scarcity; labour

¹ Indrajit Ray, ‘Imperial policy and the decline of the Bengal salt industry under colonial rule: An episode in the “de-industrialisation” process, *Indian economic and social history review*, 38-2 (2001).

² Figure 1 includes the quantity imported from Coromandel, known as Madras Permit salt in Bengal, but the volume of Orissa salt after 1830 still needs to be collected and calculated. Considering the decline of production of Bengal salt and of importation of Coromandel salt, the share of Orissa salt should be larger, at least in the 1830s.

³ The Company’s monopoly area covered Bengal, Bihar and later Assam in 1826. The physical boundaries were fixed along the border of these provinces with their adjacent regions (see Map 1).

shortages; consumer preference; the structure of internal market and mercantile activities; and the salt policies of the Company that were shaped by all these elements. In other words, economic changes in Bengal involved many factors and interactions between them. By drawing particular attention to the fuel-consuming method of Bengal's salt production, this paper points out that this method not only had an impact on the formation of the salt market and the Company's salt policies, but also made the industry vulnerable to the state of the fuel market. When a rise in fuel prices began to push up the production cost, Bengal salt met with severe competition especially with Coromandel salt, which relied on solar-evaporation without consuming fuel, and gradually improved its quality.

II. Characteristics of Bengal's salt industry

1. The salt policies of the Company

The Company established the salt monopoly in Bengal in 1772, and through a series of structural reforms during the 1780s it finally established a stable system of monopoly. The Company first took control of the production in 1780 by getting rid of intermediaries between the Company and the producers, known as *malangis*. The salt-producing coastal districts were divided into six salt agencies: Hijili, Tamluk, 24-Parganas, Jessore, Bhulua and Chittagong. The Company financed the production by directly making advances to salt producers through the salt agents who were in charge of their respective agencies. The production of any saline substances outside these agencies was banned, except for certain kinds of salt of extremely inferior quality for industrial purposes in remote districts. In 1788, the Company introduced a new salt policy—the high-price policy. Under the increasing pressure to secure and increase revenues for financing massive military campaigns and for paying salaries for its servants, the Company raised salt prices by limiting the total supply of salt and by selling it through occasional public sales.

The high-price policy had two features. First, the synergy of the Company and salt purchasers at public sales functioned to maintain high-priced salt; while the Company would limit the total supply and control all sources of supply, a small number of large purchasers would buy up all the salt and corner the market. Secondly, the Company incorporated Coromandel and Orissa salt in the monopoly system. Though the Company had at first no

intention to import ‘foreign’ salt in the 1780s, since an increase in cheaper ‘foreign’ salt in the market would lower salt prices (see Figure 2),⁴ it found that a certain amount of inexpensive ‘foreign’ varieties would keep up prices in the market by preventing an expansion of the market for illicit salt, for the following reasons.⁵

Let us start with Orissa salt. How to handle Orissa salt had been a troublesome issue for the Company in Bengal from the 1780s. There had been a huge glut of salt in Orissa under the Marathas, because the Company in Bengal imposed an embargo on salt imports from Orissa. The excess Orissa salt was thus smuggled into Bengal and Bihar by land where prices were extremely high. By the Company’s annexation of Orissa, which was followed by the establishment of the salt monopoly there in 1804, Orissa had lost its vast markets in central and southern India.⁶ As a result, more salt became glutted on the market, which aggravated the smuggling problem. The Company attempted to absorb the excess salt legally into the Bengal market by introducing the surveillance and monitoring system along the Orissa-Bengal and Orissa-Bihar border, and by opening up a licit channel of salt imports by sea to Calcutta on the Company’s account. Consequently, from 1815, half the production in Orissa became destined for Bengal.

The Company began to import a certain amount of Coromandel salt on a regular basis in case any unforeseen failure in production in Bengal should occur.⁷ Coromandel salt, which was made by solar-evaporation, was unpopular in Bengal because of its low quality and muddy appearance. It was not preferred for ritual reasons too, since it was likely to be touched by leather goods during transportation by sea. This consumer prejudice against Coromandel salt had kept its prices low in most of Bengal, and it largely supplied poorer and remote areas. Though Coromandel salt would seem to compete with Bengal salt, it did not really do so,

⁴ The Company prohibited the importation of salt by sea, since cheap salt mainly from the Cape Verde Islands would reduce salt prices. The ban was lifted in 1817, but private importers, except for some Arab merchants, were not keen on importing salt into Bengal, since the state of the salt market was unpredictable there. Salt imports by land was also banned, which changed the salt market in eastern India drastically, as north Indian varieties, which were the most important imports of pre-British Bengal, were excluded from the eastern Indian market.

⁵ The problem of illicitly-produced and smuggled salt was a major cause of reducing prices. As the high price of salt and cutbacks of Bengal salt production for keeping its supply level, which were the core of the monopoly system, created and stimulated illegal activities, the Company had to cope with the problem.

⁶ In the monopoly system of the Bengal Presidency, Orissa salt was fiscally integrated but treated differently from Bengal salt as a commodity. For details of the Orissa salt in Bengal, see Chapters 1 and 2, Sayako Miki (Kanda), ‘Merchants, markets, and the monopoly of the East India Company: The salt trade in Bengal under colonial control, c.1790-1836’, unpublished PhD thesis, University of London, 2005.

⁷ Coromandel salt was at first imported only by the French. For details, see *ibid.*, Chapters 1 and 2.

because the latter did not sell in those markets anyway, for various reasons—price, costs, taste, and consumer preference. What Coromandel salt did was to reduce the opportunities for smuggling of Bengal salt, which would compete with legitimate Bengal salt. As Coromandel salt played a part as a legitimate cheap alternative, the Company was able to raise the price of Bengal salt further.⁸

Thus, the balance of three markets—expensive Bengal (and Orissa) salt, cheap Coromandel salt and illicit salt—supported the Company’s high-price policy.⁹ Any change in these markets would disturb the balance, which eventually would hamper the working of the Company’s monopoly system.

2. The Bengal method of salt production

As said, Bengal salt (and Orissa salt sold in Bengal) and Coromandel salt were different in kind. It is important to make this distinction to explain the decline of Bengal’s salt industry. There were two types of sea salt in India: *panga* and *karkatch*. In coastal India, the production of *karkatch* salt, which was made by solar-evaporation, was popular; Coromandel salt was of this kind. Bengal and northern Orissa produced *panga* salt. The *panga* production followed two processes: collecting brine and then boiling it. Bengal’s extreme humidity made it difficult to crystallise salt by solar-power alone.¹⁰ Easy access to fuels made the *panga* production possible in coastal Bengal. Fuel materials of low calorific value such as grass and straw were used to boil brine. Since brine was boiled for long hours at a low temperature with such materials, finer and whiter salt of good quality was produced. Both the consumers and the Company preferred high-quality *panga* salt, and this preference pushed up the price of *panga* or Bengal salt in the market. Since there was already a market for cheaper salt of low quality—imported *karkatch* salt, Bengal’s salt industry became specialised in producing salt of higher quality.

⁸ The market for Coromandel salt was found only in western and north-western Bengal and Bihar. For a detailed discussion of this consumer preference and the structure of the salt market, see *ibid.*, Chapters 2 and 5.

⁹ The market in illicit salt was an integral part of the salt market, since the Company’s high-price policy always gave a strong impetus to illicit production and smuggling. But the Company did not take it seriously unless it began to affect the price of salt in the late 1820s. For details on the illicit market, see *ibid.*, Chapter 2 and 3.

¹⁰ The Bengal method shows a strong resemblance to the *irihama-enden* (入浜塩田) in Japan. North England (Tyneside) and Scotland also had a similar process of salt production. See, Joyce Ellis, ‘The decline and fall of the Tyneside salt industry, 1660-1790: A re-examination’, *Economic history review*, new series, 33-1 (Feb 1980); Christopher A. Whatley, *The Scottish salt industry 1570-1850: an economic and social history* (Aberdeen: Aberdeen University Press, 1987).

However, as we will see below, hike in fuel prices in the early nineteenth century played a crucial part in raising the cost of salt production in Bengal, and this made Bengal salt less competitive against Coromandel salt.

III. The decline of the salt industry in Bengal

1. Why did Bengal salt become costly?

The salt monopoly system operated satisfactorily to secure large revenues until the mid-1820s. By then, the defects of the system began to appear, which led to a fall in salt revenues.¹¹ One of the defects was that the salt production in Bengal became costly. Figure 3 shows different performances among the salt agencies in the cost and charges per 100 maunds of producing salt. The items of production cost and charges can be classified into two groups: the costs of manufacture and the establishment costs. The former included the prime cost of the salt—the total amount advanced to the salt producers during a season and other costs and charges incurred in the production process. The latter was needed for management of all the transactions regarding salt outside the salt agencies. As is shown in Figure 3, the cost and charges remarkably rose in the 1820s, except for Hijili and Chittagong that were relatively stable throughout. Why did the cost of production increase? The share of the establishment costs was fairly stable, moving between 10 and 20 per cent. Thus, problems lay more in the costs of manufacture, particularly the advances to the salt producers, which had a 60-70 per cent share in the production costs.

Then, why did the advances to salt producers rise in the 1820s in many agencies? First, Bengal had continuous poor seasons due to excessive rainfalls from the mid-1820s, and this was a general cause for a fall in profitability. But, although sometimes devastating, such problems caused by natural calamities were temporary. More fundamental was an increase in the rates of advances. Figure 4 compares the rates of advances per 100 maunds of salt between the year 1813-14 and 1828-29, and shows that the rates increased in all the five salt agencies. There were mainly three factors in and around the salt districts that led to a rise in the rates: labour shortages, consumer preference, and fuel scarcity.

¹¹ For details, see Miki (Kanda), 'Merchants, markets, and the monopoly', Chapters 3 and 4.

Let us start with labour problems. The Company kept the amount of Bengal salt under a certain level by cutting back on its production. Constant cutbacks of production, however, reduced the income of salt producers and deprived them of confidence in working under the Company. Thus, it was necessary for the Company to support them financially in other ways in order to secure the workforce, since there were severe competitions among industries such as the illicit salt production, silk, indigo, and sugar factories surrounding the salt districts. Salt producers were able to seek other employment at better wages. For instance, in the Tamluk agency, the number of silk factories increased from 3 in 1803 to 37 in 1818.¹² Local workers in these factories increased accordingly; in 1803, the number of local workers in the silk factories was 825 out of total 1781 workers, while it was 2,979 out of 3,104 in 1818. The rise in wages in these factories attracted many locals; the wage rose from Rs. 2.69 in 1803 to Rs. 3.19 in 1818.

In order to attract the salt producers and compete with other industries in terms of wages, the Company began to buy up any excess amount of salt from them at a higher rate. For instance, records show that enhanced price for excess salt was given to salt producers in several salt agencies in 1811-12, 1812-13, 1821-22, 1822-23 and 1823-24, and they were costly expenses for those agencies (see Figure 3). In addition to such temporary solutions, the fixed rates of advances had to be raised, as is shown in Figure 4.

Consumer preference also had an impact on the Company's policies. As mentioned earlier, in the Bengal market, consumers in general preferred Bengal (*panga*) salt to Coromandel (*karkatch*) salt, and this pushed up the price of the former. We can observe particular preferences Among Bengal *panga* varieties as well. Figure 5 compares the average auction prices of the salt agencies. What factors determined the price of salt? In terms of quality, Hijili and Chittagong salt were the best, because these districts were less affected by fresh water in the process of collecting brine. This means that Hijili and Chittagong were the only areas suitable for efficiently making salt of good quality, which was apparent in their performances, as seen in Figure 3. However, their higher quality was not reflected in auction prices; inferior Tamluk, the Twenty-Four Parganas, and Jessore salt fetched much higher prices than they did. These three agencies had difficulties in producing salt of high quality due to constant permeation of fresh water from the Ganges and its branches. Nevertheless, consumers appreciated the salt made from the 'sacred' Ganges water, which led to higher prices of salt produced in these agencies.¹³

¹² BRC-Salt, P/100/22 (2/10/1818), no.6.

¹³ Appendix F, no.2, BPP, vol.26, 1856. Orissa salt, which was also *panga*, always fetched the highest price at auctions, despite its distance from the Ganges and was imported by sea voyage. High-quality Orissa *panga* seems to have targeted major urban markets as an upmarket brand. It appears that the *panga*

In order to increase salt revenues by selling expensive salt in larger quantities, the Company expanded the salt production at the mouth of the Ganges. In 1819, they divided the Twenty-Four Parganas agency into two, creating the Jessore agency. In other words, this step taken by the Company shows that they institutionalised the consumer preference in the monopoly system. However, being situated in the woods, known as the Sundarbans, production in these agencies was costlier and troublesome than in other agencies (see Figure 2).

2. Fuel Problems

For the salt industry in Bengal, the price and availability of fuel would influence a success or a failure of production. Thus, the want of fuel also played a major part in the rise of cost in manufacture. The salt producers needed to gather sufficient fuel (grass and straw) for the entire boiling season (usually from November to March), using the advance money given from the Company. Each salt agent was in charge of the distribution of advances and was responsible for preventing any failure in fuel collection; he had to make sure that producers had enough money to buy fuel when it was cheap and plentiful.¹⁴

Occasionally, fuel got scarce for various reasons. An excessive rainfall and a collapse of bunds would cause floods in fuel lands. When the relationships with proprietors and peasants of grass lands and paddy fields were not satisfactory, access to fuel materials would be refused. In such cases, the salt producers had to send people out to purchase fuel, which cost usually exceeded the money they had as advances. To avoid a failure in production, the salt agents themselves had to procure fuel for them. For instance, when many parts of the Hijili Agency were flooded in 1788, the salt agent purchased surplus brushwood from the neighbouring Tamluk Agency to make up the deficiency.¹⁵ The Twenty-Four Parganas Agency leased grass lands from proprietors in order to secure fuels within the agency.¹⁶

In the early nineteenth century, procurement of fuel became a serious problem for the salt producers as well as the salt agents. Natural calamities such as floods, and the constant

market had several layers of markets within it, according to differences in quality, price, and cultural or ritual value.

¹⁴ The advances were usually divided into three instalments; in most agencies, they were provided in November, February and April. There were also intermediate advances, known as *howlath*, to meet the occasional exigencies of the salt producers for the supply of fuel and boiling pots. BRP-Salt, P/101/56 (6/11/1829), nos.9-12.

¹⁵ BRP-Salt, P/88/72 (3/2/1789); (25/2/1789); (10/3/1789). Twigs and brushwood were used for boiling in an emergency.

¹⁶ BRC-Salt, P/98/25 (26/7/1793), nos.2 and 4. The lease cost the agency Rs. 2,600 per annum.

movement and encroachment of river channels occasionally devastated fuel lands. These problems became acute in the agencies located at the mouth of the Ganges and Meghna. It is likely that the Company's hasty development of these areas as salt-producing sites, which were geographically disadvantageous for salt production, created and aggravated the situation.

In addition to such natural causes and changes in the topography in the salt-producing districts, a more fundamental transformation had been taking place in Bengal during the early nineteenth century. There were signs of a large market for straw (and probably grass too). The price of straw began to rise, which affected adversely the salt production and other fuel-consuming industries as well. As is shown in Figure 6, the price of straw in Tamluk surged between 1800-7 and 1818, despite the general price depression in the 1810s. In the first period, it was between Rs. 0.57 and 0.67 per *kahan*, while in 1818 it ranged from Rs. 1.14 to 2 per *kahan*. The salt producers had to buy expensive straw in the market when there were no alternatives.

What factors caused a rise in fuel prices in Lower Bengal in the early nineteenth century? We need further examination on this topic, as little work has been done thus far. Here, I will point out the possible factors that led to a rise in fuel prices. First, under the Company's monopoly, the salt-producing districts extended mainly to the areas where fuel materials were relatively scarce, which inevitably created a further demand for grass and straw. Secondly, the fact that the above example of straw prices in Tamluk fluctuated according to the Calcutta straw market suggests that there was a general growth of the market in straw.¹⁷ It is likely that one of the underlying factors that proprietors or peasants of fuel land began to refuse the access of salt producers to straw was that the sale of straw in the market had become more profitable.

Straw was used as building materials and as fuel (for domestic use, it was used mixed with animal dung). Population growth without major famines would have increased the consumption of straw. In the late eighteenth and early nineteenth centuries, the expansion of cultivated land under the increasing revenue pressure by the Company may have caused an increase in the supply of straw. But the increase of straw in the market did not ease the tight fuel market, since land reclamation was usually accompanied by a disappearance of grassland as well as forest—the major source of fuel materials such as firewood. It is very likely that the growth of other fuel-consuming industries such as silk and sugar industries nearby accelerated the competition to access fuel as well.¹⁸

¹⁷ BRC-Salt, P/100/22 (2/10/1818), no.6.

¹⁸ We need further examination on what kinds of fuel materials were used in other industries. If grass and

Finally, it appears that the fuel market in general was getting very tight in the early nineteenth century, which partly explains the rise of straw prices. The commencement of the British rule significantly increased fuel consumption; factories powered by steam engines increased and steam ships began to navigate along the Ganges from the 1820s. Although commercial coal production began in Bengal in 1815, the supply of coal including imports from Britain was hardly able to keep pace with the rising demand. Steam engines were thus fuelled not only by coal but also by firewood, which led to a further demand of firewood. Under the condition that many parts of India had already faced a severe shortage of firewood and charcoal before the advent of British rule due to massive deforestation, the growing demand of fuel in the early nineteenth century would have exacerbated the state of fuel market.¹⁹

In spite of such fuel problems, the Company continued the Bengal's fuel-consuming production method. Though the Company experimentally used alternative fuel materials such as twigs and brushwood and introduced the more energy-saving solar-evaporation method (the production of *karkatch* salt) in Hijili and Chittagong in the early 1830s, it had little incentive to abandon the Bengal method of salt production or to search for alternative fuels. Conversion of energy to higher calorific materials such as wood and coal was impractical for the following reasons. First, as said earlier, coal and firewood were short of supply. Secondly, the boiling of brine with fuels of higher calorific value would lower the quality of salt (coarser crystals), since brine evaporates quickly. Thirdly, a switch of fuels would require large investments in new skills and equipment such as tougher boiling pans that were able to withstand higher temperatures. It was financially unrealistic for the Company to undergo such processes, when the salt revenues were on the decline from the late 1820s. Finally, it can be said that there was no chance for the Company to solve the fuel problem, since to materialise these changes meant that it had to give up its long-standing salt policy that had institutionalised the consumers' preference to expensive Bengal salt.

straw were used, there would be a severe competition over fuel between industries. But if other industries used other fuel materials such as firewood or charcoal, the structure of the fuel market should consist of several layers.

¹⁹ For details of the problems of the energy market in India, see Sayako Kanda 'Shokuminnchi-ki Indo no kogyoka ni kansuru ichikousatsu—enerugi shijo tonon kankei kara (Energy and industrialisation—Reconsidering the economy of nineteenth-century India)', *KUMQRP discussion paper series*, DP2005-022 (Feb 2005).

3. The transformation of the salt market

While the salt production in Bengal became costlier in the late 1820s, ‘foreign’ salt came to compete with Bengal salt in the market. This caused an upset the balance of three markets—expensive Bengal (*panga*) salt, cheap Coromandel (*karkatch*) salt and illicit salt. This led to the collapse of the high-price policy of the Company. As said, Coromandel (*karkatch*) salt was initially unpopular in Bengal, sold only in certain districts in Bengal and Bihar. But the market for *karkatch* salt gradually expanded to other districts.²⁰ *Karkatch* prices increased accordingly. The price of *karkatch* had been much lower (about Rs. 100 per 100 maunds) than the average Bengal (*panga*) salt, but *karkatch* was no longer cheap in the late 1820s. As is shown in Figure 5, the average salt price of *karkatch* for ten years from 1823-24 to 1832-33 was Rs. 375 per 100 maunds, which exceeded that of Bengal Bhulua salt. According to the price reports from the commercial agents, *karkatch* and *panga* began to compete with each other in terms of price at several stations in western Bengal such as Santipur.²¹ The rise of *karkatch* prices in Bengal was largely brought about by the following factors: the development of the export-oriented salt production on the Coromandel Coast; by the improvement of its quality to meet the demand in Bengal; and by the increasing pressure from the salt importers on the Coast.²² Ironically, such development was encouraged initially by the Bengal government. An increase in the circulation of *karkatch* salt of improved quality had changed the attitudes of consumers in many parts of Bengal.

Orissa salt was the same variety as Bengal salt, so it circulated in the same *panga* market. But since Orissa salt was of superior quality than Bengal salt, Bengal salt never competed with Orissa salt in terms of quality. This was because Orissa salt was not a type that was affected by fresh water. It always fetched the highest price among all the varieties at the Company’s sales. In order to prevent Orissa salt from being smuggled into Bengal, more Orissa salt had to be

²⁰ The price reports from the district magistrates in 1834 show that *karkatch* was sold at major markets in 11 districts in western Bengal and Bihar out of total 24 (BRP-Salt, P/104/84, 15/1/1834, nos.13-38). Despite the geographical expansion of *karkatch* market, *karkatch* was never consumed in eastern and north-eastern Bengal. This suggests there was a clear regional difference in the perception of salt. See, Miki (Kanda), ‘Merchants, markets, and the monopoly’, Chapter 2.

²¹ The price of *panga* salt was rather on the decline from the late 1820s, largely owing to an expansion of the market in illicit salt as the Company and the large salt purchasers had lost control of the market. For details, see Miki (Kanda), ‘Merchants, markets, and the monopoly’, Chapters 3 and 4.

²² For details on the salt trade between Bengal and Coromandel, see Sayako Kanda, ‘Kan-Bengaru-wan shio koeki nettowaku to tobu indo shio shijo no henyō (1780-1840 nen)’, [The trading networks in the Bay of Bengal and the transformation of the salt market in eastern India, c.1780-1840], Naoto Kagotani and Kohei Wakimura eds., *Ajia ni okeru chōki no 19-seiki—Teikoku to nettowaku—*, [The long nineteenth century in Asia—Empires and networks—] (Kyoto: Sekaishiso-sha, forthcoming).

imported into Bengal licitly, which increased the circulation of *panga* salt. This inevitably led to further cutbacks of production of Bengal salt in order to keep *panga* prices up.

Conclusion

The salt industry in Bengal had developed a method of producing high-quality salt, making most of its abundant fuels. It showed further development under the Company's monopoly, which incorporated the features of the industry into its system in order to maximise profits. However, the Bengal salt industry became costly and less competitive from the late 1820s, and had to scale down in the mid-1830s. Therefore, the industry declined not by the incursion of Cheshire salt but by the fact that Bengal salt had become less competitive due to the rise in production costs.

The Company failed to solve this problem, because its salt policy that incorporated the consumer preference for *panga* salt failed to counteract fuel shortages in the early nineteenth century. This failure eventually led to a fall in the Company's salt revenues. In addition, after the Company's monopoly integrated 'foreign' salt in its system, there was a potential inter-regional competition in the salt market in Bengal and Bihar. With fuel prices on the rise, the fuel-consuming Bengal method of production was at a disadvantage compared to the *karkatch* production. Bengal salt was also unable to compete with Orissa salt of the same boiling variety in terms of quality and efficiency.

India had faced a severe energy problem—fuel scarcities due to massive deforestation—long before the advent of British colonial rule. The global contest for resources between Britain and other European countries influenced India's domestic fuel market from the mid-eighteenth century, and the emergence of the coal industry in eastern India in the early nineteenth century did not solve the energy problem or improve the 'quality' of the fuel market. These factors significantly influenced the direction of India's industrialisation. However, indigenous industries had developed techniques and skills to deal with the fuel problems, by utilising low-calorific fuels, recycled fuels such as bagasse (sugarcane waste), twigs and brushwood available in the vicinity, and by combining different types of locally-available fuel sources. By doing so, these industries had grown slowly over centuries.

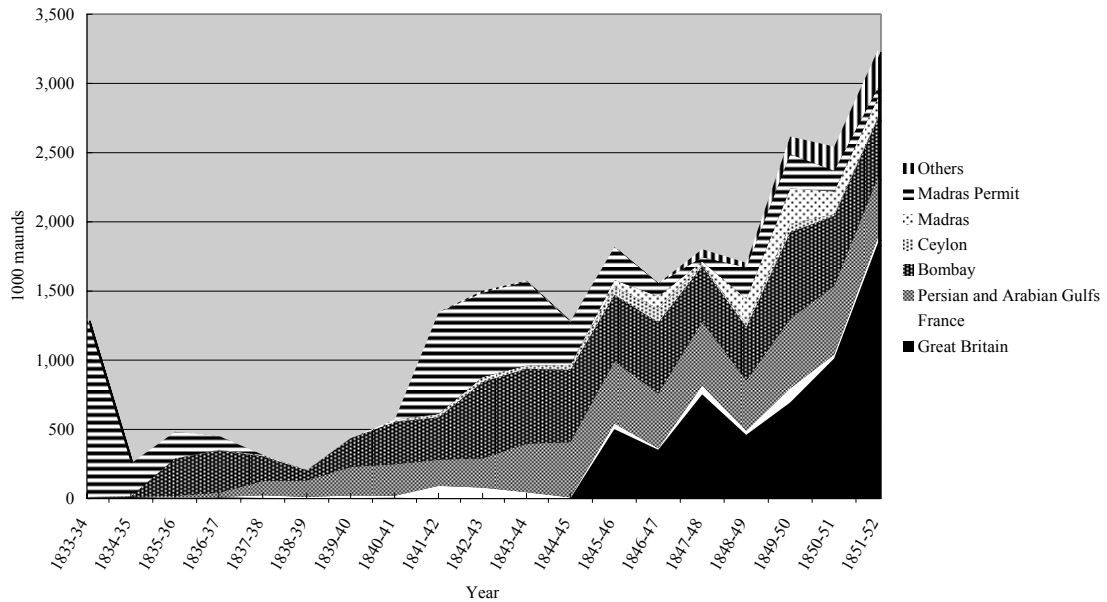
I would like to call this type of development of industries as 'energy-saving', though this terminology is yet to be defined. This 'energy-saving' development must involve inter-regional competition. This inter-regional competition functioned as one of the solutions to solve fuel

problems by eliminating less fuel-efficient methods or locales. In the case of the salt industry, although the salt industry in Bengal declined, the competition among different varieties led to an improvement of quality and efficiency; the growth of the salt industry on the Coromandel Coast was largely attributed to this competition in the eastern Indian market. Later, the improved *karkatch* method was introduced in Hijili and Chittagong. As a result of such competition, the salt industry survived in Bengal too.²³

These features characterises industrial development and the use of energy in India to this day. If we place too much emphasis on colonial rule, we face the risk of obscuring our grasp of the actual process of industrial development in India, which has led to her strong economic performance today.

²³ The sugar industry in north India also shows an ‘energy-saving’ development pattern with regional competition. The ‘energy-saving’ method was also seen in modern sugar factories in the United Provinces. See, Sayako Kanda, ‘Energy-saving industrial development in India: a case study of the sugar industry’, *KUMQRP Discussion Paper Series*, forthcoming.

Figure 1: Calcutta Salt Imports, 1833-34 to 1851-52



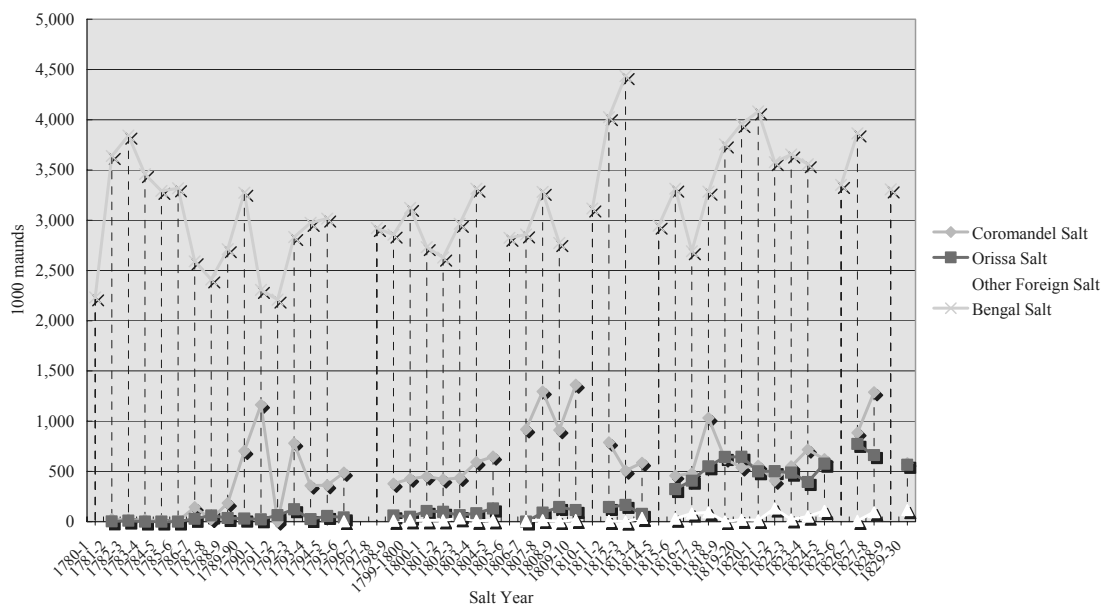
Sources: 'Minutes of evidence taken before the select committee on Indian territories', BPP, vol.28, 1852-53, pp.164-165; Appendix L to the Salt Reports, BPP, vol.26, 1856.

Notes: Madras Permit Salt indicates the salt imported by the East India Company from the Coromandel Coast. Other varieties were imported on private account by paying duty, which increased after the cessation of the Company's commercial activities.

This figure does not include the imports from Orissa on the Company's account.

1 maund is about 37.3 kg.

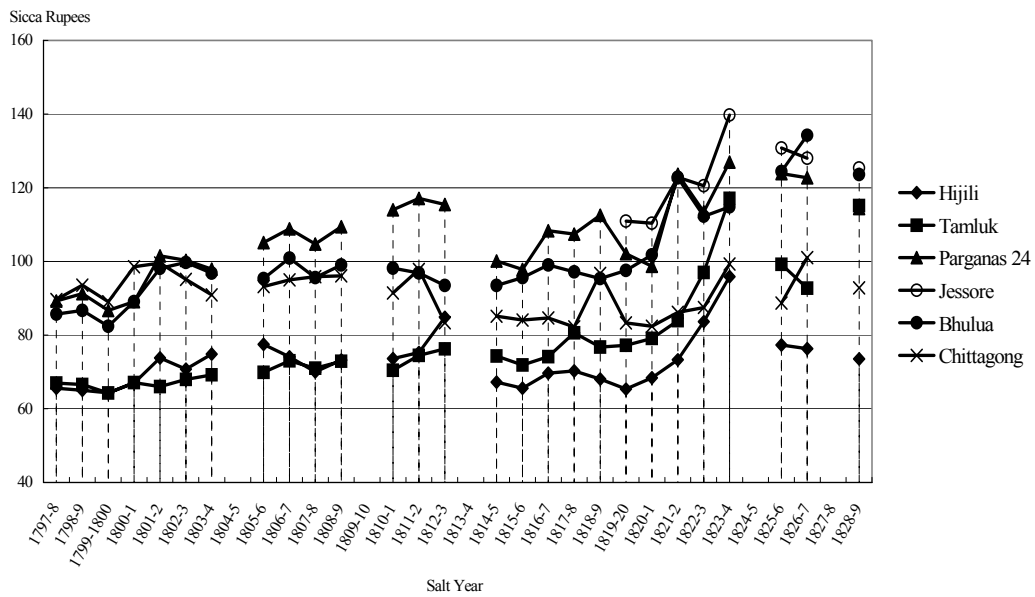
Figure 2: Varieties of Salt Sold at Public Sales in Calcutta, 1780-81 to 1829-30



Sources: BRP-Salt, P/89/2 (5 Dec 1792); P/100/13 (26 Dec 1817), no.4; P/100/23 (16 Dec 1818), no.1; P/100/28 (24 Sep 1819), no.2; P/100/36 (20 Oct 1820), no.4; P/100/43 (14 Sep 1821), no.3A; P/100/52 (24 Sep 1822), no.8A; P/100/61 (30 Sep 1823), no.11; P/100/72 (19 Nov 1824), no.29; P/101/12 (28 Feb 1826), no.5; P/101/31 (4 Dec 1827), no.7; BRC-Salt, P/98/26 (28 Jul 1794), no.5; P/98/27 (8 May 1795), no.4; P/98/27 (20 Jul 1795), no.2; P/98/32 (18 Jul 1796), app. no. 1; P/98/35 (25 Jul 1799), no.3; P/98/43 (5 Aug 1802), no.3; P/99/16 (30 Jan 1806), no.2; P/99/26 (11 Sep 1807), no.2; P/99/30 (12 Aug 1808), no.3; P/99/34 (25 Aug 1809), no.2; P/99/39 (29 Oct 1810), no.3; BT-Salt, WBSA vol.75 (4 Aug 1812); vol.85-2 (17 Aug 1813); vol.95 (23 Aug 1814); vol.113 (16 Aug 1816).

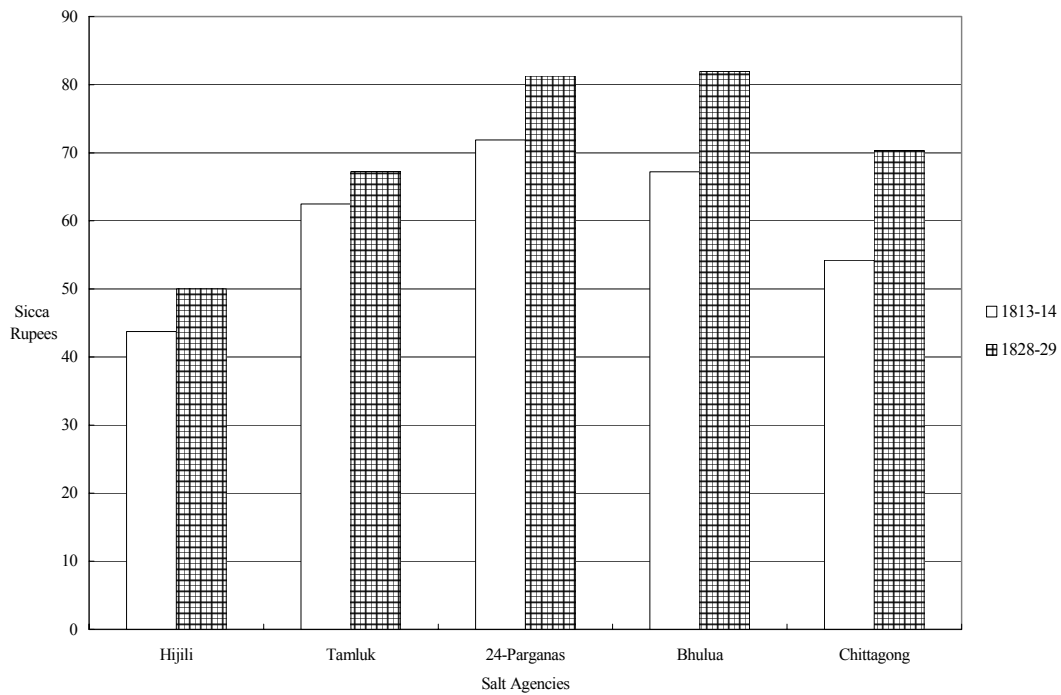
Notes: One salt year above was twelve months from October to September, which was used to calculate the annual profit and loss of the salt transactions of the government. For foreign salt, the salt year was the twelve months from May to April.

Figure 3: Cost and Charges per 100 maunds of Bengal Salt, 1797-98 to 1828-29



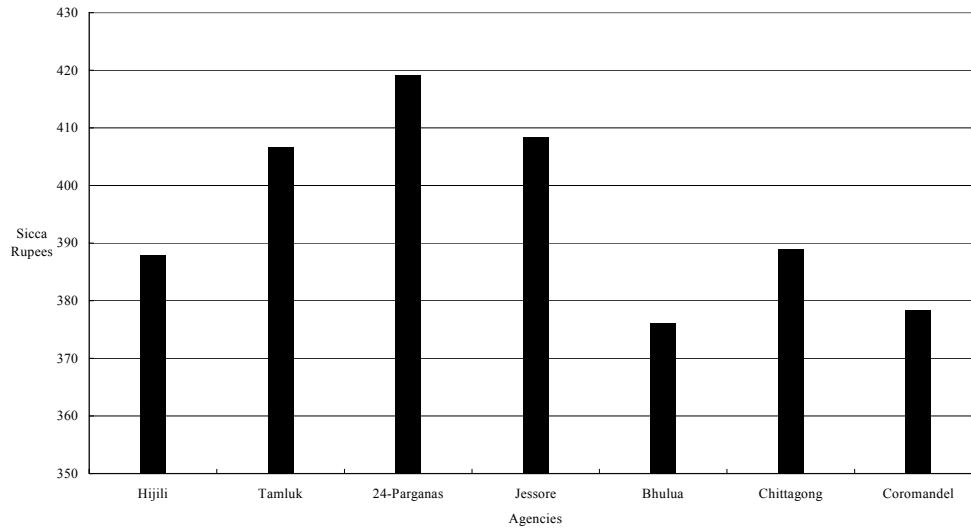
Sources: See Figure 2.

Figure 4: The Average Rate of Advances to Salt Manufacturers (per 100 maunds)



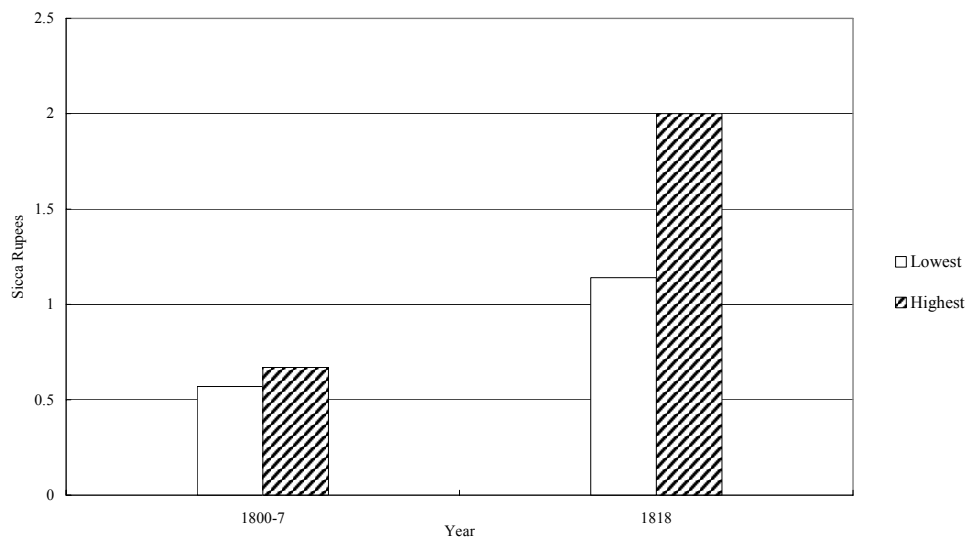
Sources: BT-Salt, vol.86 (21/9/1813); BRP-Salt, P/101/49 (14/4/1829), nos.11-24.

Figure 5: Average Sale Prices per 100 maunds of Salt, 1823-24 to 1832-33



Source: BRP-Salt, P/105/21 (2/2/1836), no.11H.

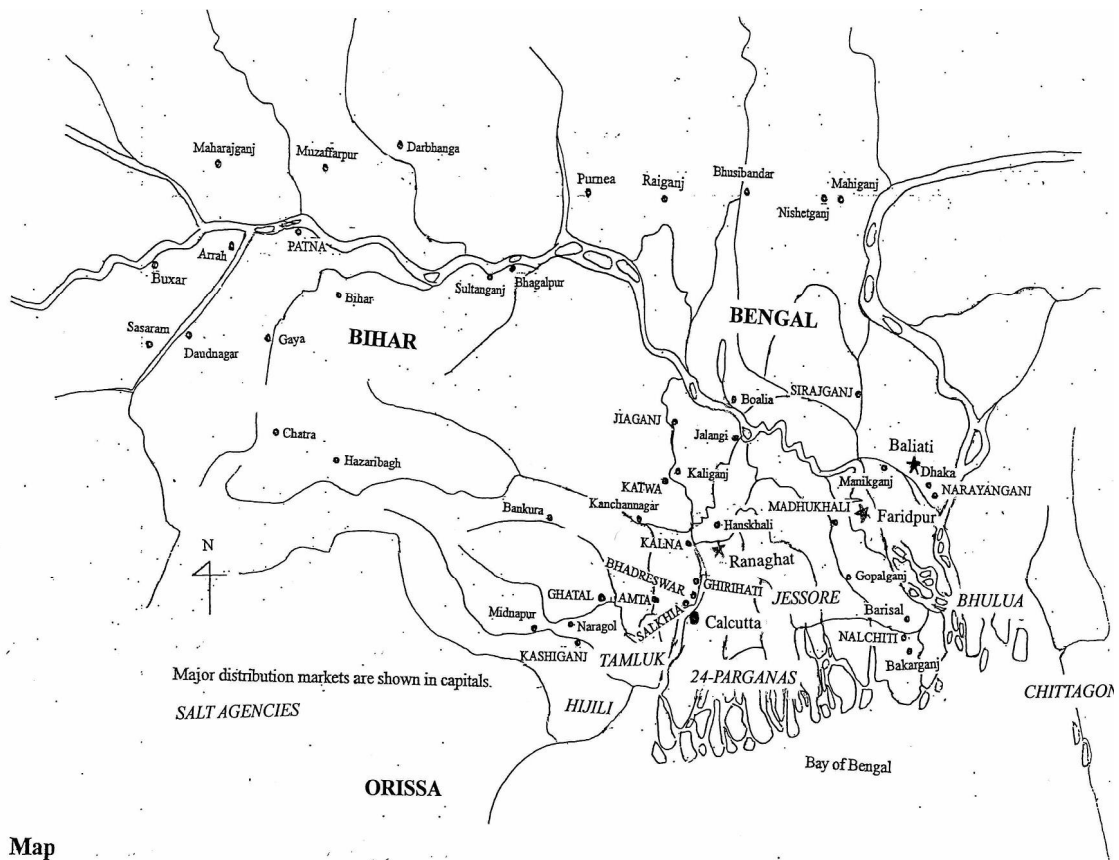
Figure 6: Increase in Straw Prices in Tamluk (per kahan)



Source: BRC-Salt, P/100/22 (2/10/1818), no.6.

Note: *Kahan* is a unit for measuring weight of the straw.

Map 1: Salt Agencies in Bengal



Abbreviations

BPP: British Parliamentary Papers

BRC-Salt: Bengal Revenue Consultations (Salt, Opium and c.)—Salt

BRP-Salt: Bengal Board of Revenue (Miscellaneous) Proceedings—Salt

BT-Salt: Bengal Board of Trade Proceedings—Salt