

Extraction: Processing and Trade in Limestone in the Southern Region of the Khasi-Jaintia Hills during the Colonial Era

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Abstract

The limestone trade in the foothills of Khasi-Jaintia began during the Mughal era. The advent of colonial rule in Bengal led to the expansion of the lime trade. European merchants, including the French, Greeks, Dutch, English, and Armenians, invested their capital in the limestone business. Information about commercial activities in this region, particularly the lucrative limestone trade, was documented by collectors of Sylhet such as William Makepeace Thackeray and Robert Lindsay in their reports to the Court of Directors in Calcutta. These reports highlighted the flourishing lime trade. Besides limestone, other commodities such as oranges, forest products (including bay leaves and black pepper), as well as iron slags and tools, were also traded. Later, British officials like Thomas Terraneau, W.J. Allen, B.C. Allen, Thomas Oldham, and T. Jones provided detailed accounts of how the Khasi-Jaintia people carried out the quarrying and extraction of limestone. Interestingly, most of the lime-making process took place in the plains of Sylhet Limestone from the hills was used by the company not only for construction work in Bengal but also supplied to other parts of India. Oldham noted that the limestone from this region, particularly from the *Sohbar* belt, was of the purest quality and did not require processing. The extraction and lime-making techniques were simple, and fuel for processing the limestone into lime was readily available. However, by the 1890s, the lime business began to decline due to the availability of limestone from other parts of British India. The great earthquake of 1897 further altered the topography of the region, accelerating the industry's collapse.

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Introduction

From the accounts, reports of Thomas Terraneau, W.J. Allen, B.C. Allen, Thomas Oldham, T. Jones and others it is brought out that Khasi-Jaintia people carried the process of quarrying and extraction of limestone but the process of lime making was carried on by the locals from the plains of Sylhet. Along with the manufacturing of lime almost all the villages situated near the banks of the river Surma, were engaged in the limestone trade. Of them, two villages Chattack and Chunamganj emerged as important trade centres as they became the nodal points for the supply of lime to Sylhet.^[1] As a result, all Indian, Armenian and European merchants set up their factory depots to hoard the lime that was supplied to them by their agents. As mentioned in the earlier accounts and reports by the British officials, the limestone was drawn from the Khasi-Jaintia Hills quarries which were leased to them by the Khasi Syiems and Jaintia Rajas for a specific time period. These centres grew into important urban centres or townships.

Besides, iron and its products, limestone, was another mineral of economic value, it constitutes one of the major economic activities carried by the Khasi-Jaintia. Even though all the limestone quarries belonged to the Khasi-Jaintia, the limestone trade was mostly in the hands of the foreigners since the Khasi-Jaintia leased the quarries for extraction of the stone while the business and trade transaction was done by the non-Khasi-Jaintia, the (non-tribal) dkhar. Sylhet limestone was acquired from the Khasi-Jaintia foothills at the foot of the Cherra-poonjee Plateau, which is known as the Pandua-Laur region, present day East and South West Khasi-Jaintia Hills. It is from the Jaintia Hills that the limestone trade can be said to have commenced since the rule of the Mughals.^[2]

Extraction

The extraction of limestone was carried throughout the whole year. However, the quarries were mostly worked during the dry season since most of the quarries were situated in areas

where outbreak of malaria, cholera and other diseases frequently occurred. However, in case of occurrence of malaria or any other malady, most of the workers would abscond from the quarries and the villages and return back only after they were convinced that the disease had disappeared. It is important to note that, even during the period of outbreak of any such disease the supply of lime to Sylhet remained unaffected; this was possible because the lime merchants due to previous experience would store surplus lime at their depots which enabled them to meet the required demands. The largest quarry of the Pandua foothills was situated at Tungwali village. Limestone from this village and also from the neighbouring quarries like Teriaghata and Lacat, which were surrounded by orange groves were sent to Chattack. It is from this region of the Khasi-Jaintia hills that we get the limestone which is 'of the purest alabaster lime and appeared, in quantity, equal to the supply of the whole world'.^[3] Thus, almost all the inhabitants of the villages living in the foothills of Pandua and Laur region were busy in their mercantile activities.

The process of extraction of limestone which was adopted by the Khasi-Jaintia, right from the middle of the eighteenth century till the twentieth century, was in fact a simple traditional method: firstly, the top soil was removed and when the limestone makes its appearance they would dig out the limestone with iron rods and then thrash the stone into an irregular piece of medium stone size which they would then carry to the riverbanks; then transported them to all the kilns which were situated near the river banks. The weight of stone that was mined from the quarries varied in size and form, from $\frac{1}{2}$ to $1 \frac{1}{2}$ maunds each. At the same time, the large size stones were positioned next to the fire till they gradually reduced in size; then they were broken on the spot to further smaller size equivalent to a man's fist.^[4]

For transporting the limestone from the quarries situated in the hills to the sites where the kilns were set up in the plains, the Khasi-Jaintia would use riverine transportation which commences with the onset of monsoon rains with effect from last week of April every year. This continued as long as the rivers and streams were filled with water to the brim, which enabled the small boats or canoes to ply down the swift rapid rivers that descend from the hills to the plains of the Surma at a lighting speed and dangerous level, which at times led to death while bringing the stone to the kilns that were situated near the riverbed. By the end of October, the water level would come down drastically and the once busy riverine transportation almost comes to a standstill. The big rivers and streams would turn into little nullahs (Drains) that even the light canoes which usually flow on shallow depth and draw only a few inches of water, are frequently left stranded in the middle of their course.^[5] The stone was then brought down to the banks of the river by the Khasi-Jaintia people and they were carried by the local lime traders or Beparies (lime traders) to their kilns that were situated on both sides of the banks of river Surma^[6]

Limestone Processing

As regards the structure of the kiln or Pajwa, (limestone kilns) both W.J. Allen and T. Terreneau (1830) observed that most of the limestone kilns were usually constructed near the river banks for security against fire. The first step in the process of making kiln or pajwa was to dig out a hole in the shape of an upside-down cone which is approximately not less than ten feet deep. Then, stones were laid on top of one another till the structure reaches a height of about five feet from the surface

of the ground. The upper section of the kiln or pajwa would then be covered with straw and plastered with mud.^[7] The standard size of almost all the kilns is made to hold a minimum of seven to a maximum quantity of eight hundred maunds of lime. But due to pressure for maintaining a high temperature, the lime workers would keep piling the kilns with reeds and wood to reduce the consumption capacity of the kilns from seven hundred or eight hundred to five hundred or six hundred maunds.^[8]

The process of manufacturing of lime was prepared through three principal processes: limestone preparation, calcinations and hydration. It was the calcination process which was an art of the earliest methods of manufacturing lime. In this process, the limestone was dried by exposure to strong heat; then the limestone would be covered with dry grass and wood which acts as fuel to reduce the stone to lime. The burning is done in enclosed walls forming essentially a pot shaft kiln which they still practice till date.^[9] Once the limestone was kept inside the kilns, the process of ignition commences right underneath the centre of the kilns where the limestone rocks were placed. In 1831 Terrneau mentions that the processes of lime-making depended on the weather. During hot and dry weather, the process for lime making would take only four days and five nights. The fuel which was used during good weather was locally known as the null or reeds which were usually placed on the bottom of the kilns and at the centre of the openings. The outer-course of stone was protected by a plastering of mud at a thickness of $1\frac{1}{2}$ to 2 inches. The reeds were of course soon consumed, but not before the clay becomes nearly half burnt. As soon as crack appeared in the outer wall of the kiln the limestone workers would again coat it with mud to the thickness of 4 to 5 inches. The limestone workers would need to check that the ventilation of the upper parts of the kiln was free so as to enable the workers to detect whether the stone had received sufficient heat for burning. The process is almost complete after the end of the fourth day or on the fifth night when the outer coating crack for the second time and when the ventilation from all sides of the kilns do not emit any smoke.^[10]

After the fourth or fifth day the stone would turn radiant due to the heat. Through the small opening that was created from the upper surface where the kilns were constructed, the lime burners would observe and notice that the stones had turned white with small yellowish patches. This yellowish colour indicates that the process of calcinations is complete.^[11] B.C. Allen mentioned that the process of lime-making in bad weather took twelve to fourteen days since most of the kilns used reeds as fuel and they would have to refuel it every now and then which resulted in the failure of the kilns to maintain the required heat for converting the stone into powder lime.^[12] The fine white powder of lime would fall down along with loose fitting stone which was then crushed into powder and packed in bags to be carried to Sylhet and transported to Calcutta.^[13] The lime in this case was removed both from the opening of the bottom of the kilns as well as from the upper mouth of the kilns, whereas, in the report of Oldham, lime was removed from the upper section of the kilns only. However, despite the availability of coal in large deposits along with the limestone tract as mentioned by Oldham in his Geological Report on the Structure of the Khasi-Jaintia Hills, coal was never used during the process of manufacture of lime, as in the case of smelting of iron ore. Instead, they used wood or reeds. Most of the firewood and reeds were collected from the foothills of the Pandua and the Laur region as well as from Jaintia and Cachar.^[14]

The reeds or null and the dry wood used as fuel for the kilns were procured from the marshy regions and brought down to the river ghats or river port by rafter. To save time and cost of transportation the reeds were sometimes tied up in a bundle together with logs of about three to four feet long and would be made to flow downwards to where the kilns were set up. On reaching the kilns the lime maker would collect the reeds and dry them near the kilns till they are completely dry. The reeds which are tied together were then cut into two or three pieces each and allowed to be burnt. Terraneau noticed that about eight hundred to eight hundred twenty maunds of wood were used for igniting a kiln with a capacity of consuming seven hundred maunds of stones. However, it is important to note that it depends on the season and the weather condition regarding the consumption of reeds; if the weather is fine and dry, then there would be equal proportion regarding consumption of reeds and the amount of the stone burnt. The only stage where consumption would be at its peak was at the beginning of setting the kilns ablaze so as to meet the required heat for burning the stone into lime. ^[15]

The reeds that act as a fuel for burning the stone were generally brought down to the river banks before the onset of rain. During the rainy season which usually starts in April, wood is used as a substitute and the kilns are temporarily protected with slender separable roofs. Teraneau further points out that Paharpunji, which is the nearest quarry below the Pandua hills, is where limestone deposits are of an immense potential for economic gain but the best quality was that of the Laur region. The wood was generally supplied by the Tandars or wood merchants who usually sign an annual contract with the Lime merchant. Most of the wood is procured from Banscandi, Dudpattli and other parts of Cachar. Around 1000 maunds of wood were valued at Rs. 30/- to Rs.40/- when landed at the kilns. ^[16]

A kiln that uses reeds which come in bundles of ten to twelve to thirteen feet long, with the circumference of two and a half to three feet, would require two thousand to two thousand five hundred bundles of reeds to be fed for a kiln that will consume seven hundred maunds of stones. The same type of kiln will need about eight hundred to eight hundred twenty maunds of wood to be used for igniting a kiln with a capacity of consuming seven hundred maunds of stones. Whether the reeds or wood was used as the fuel for burning the stones, the process or the method adopted was the same; they would have to constantly feed into the kiln so that it will be able to sustain the required temperature and this will continue for four days or five days. ^[17] However, it had been noticed that kilns that use firewood consume less in comparison with the kilns that use reeds.

Recently through field study conducted at Shella, Ishamati, Bhologanj, Nongtrai, Hat Mawdon and other places of the southern War Khasi-Jaintias found that the limestone they produce were assigned different names according to the processes and the fuel they adopt while burning the stones. One such variety is Shun-Kpu or powder lime otherwise known as the slaked lime which is used mostly for construction purposes. Another type of lime, Shunmaw or the un-slaked lime, in the shape of rough stone of different sizes, was generally used for whitewashing of buildings. Another type of lime was Shun-diewieng which is processed by the burning of coal and Shun-Dieng which was processed through the burning of firewood and wild reeds. Thus, the system for smouldering of limestone differs not only from place to place but it also depends on the process of the fuel they used for burning the limestone. ^[18]

In the present times, the system of extraction of limestone continues to be carried on by the same technique that was used by their forefathers two hundred years ago. For instance, the same technique and process of extraction and mining of limestone that had been carried out prior to the advent of the English on both sides of the riverbank persist till date in the Shella village. In the post-independence era, the limestone commercial activities continue to flourish with the people of southern Khasi-Jaintia Hills and Bangladesh, then known as East Pakistan, as the Governments of both the countries permitted free entry of merchants on either side. After Independence the Indian Government and the East Pakistan Government permitted free export of material for any trader if the material was below Rs.500/- but if the material was above Rs.500/- they would have to pay tax according to the Government rules and norms fixed by them. ^[19]

It can be said that the system of processing the limestone continues with the same technology. But the fuel for ignition was different depending upon the availability of the sources of fuel. For instance, the limestone process near the borders of Bangladesh used firewood and reeds, whereas, the limestone processor in and around Cherra-poonjee preferred coal. At present the limestone merchants in order to accelerate the speed of production of lime used explosive material like nitrate mixture, safety fuse, ordinary detonator and electric detonators which have had a devastating impact on the surrounding areas and have changed the topography of the areas due to excessive use of such materials. ^[20]

The village people of Shella make use of these explosives but they use it in a very limited way. Thus, they have been able to preserve the environment to a certain extent. The Shella limestone workers at present, adopt the following technique: firstly, they would dig a one-foot-deep hole with an iron shovel or u Nar samsuloi, then they would fill the hole with ammonium nitrate connected to a fuse and ignite it with the help of a battery. Another method is when they would just fill the hole with the explosives powder and with the help of an iron rod or u Nar Kynsahsuloi push it inside the hole for detonation which would then be blasted. The limestone acquired by this process appear in the shape of a big lump of stone which was then broken into pieces by a u Tyrnem or hammer and then carried off by boat to the nearby kiln and to Chattack. The natives who work on the quarries use the basket or ka Khoх kit maw for carrying the stone while the Bengali workers and the Garos use the round basket which they usually carry on the head for the transportation of the limestone to Chattack. ^[21]

Regarding the process of burning the limestone some changes have taken place with slight modification of the kilns. At present the limestone workers have better store rooms to stock the coal, charcoal, firewood and wild reeds which were used as fuel for burning stone. The floor of the kilns and their walls were covered with tiles and the roof is either cemented or tin is used to cover the roof of the kiln. Firewood which was once the principal agent for ignition the kilns or pajwas has been replaced by coal. However, due to lack of financial aid as well as lack of better means of communication, coal as a fuel cannot permanently replace the wood or charcoal. ^[22]

During a recent field study at Ishamati the pajwas or the kilns were in the shape of a semi-circle which comprises of two to four strata of stone which was laid in the form of a circle or in some kiln laid in an oval shape. The depth of the inner part of the kilns was approximately 12 to 14 feet dug in a conical shape and the upper section from the mouth of the kiln was raised to a height of 12 to 15 feet in the rounded

conical shape. The outer layer of the stone was plastered by the clay locally known as dew-byrtha or dewmutha. The two strata look like two halves of a giant washing basin. At the upper part of the plate, a small opening was arranged to allow the passing of the fluid and smoke. However, no kiln or pajwa were cemented as they cannot withstand the heat. The burning of limestone continues for five to six days till the spark of fire comes out from the small openings which indicate that the process of lime-making is almost over and time to be extinguished. Thereafter, the process of removing and packing the lime in plastic sacks or tin container takes place.^[23]

Trade

The lime trade in the foothills of the Khasi-Jaintia continued since the time of the Mughals and further expanded with the arrival of the Europeans like the Greek, French, Dutch, Portuguese and the Armenian. During the time of the Mughals, limestone trade was the monopoly of the state as the Mughal Government directly leased the quarries from the Khasis. Limestone was sent down to the plains of Sylhet and from there, it was carried to Dacca and Calcutta. But, when Bengal came under control of the English East India Company, limestone trade was open to all. Subsequently, the trade gained importance as it contributed a major revenue to the Company. This resulted in the growth and development of limestone trade and the opening of more quarries throughout the entire foothills of the Laur region, the entire southern part of Jaintia hills and the Pandua.^[24]

When the Bengal came under the control of the English East India Company, the flourishing limestone in the foothills of the Khasi-Jaintia gain momentum due to the involvement of Europeans traders like the Greek, French, Armenian and the Dutch. Therefore, in order to control the lime trade activities James Harris, the Chief of Dacca report to the Court of Directors at Calcutta to control the frontier market engaging in lime trade and to adopt stringent measures for the collection of revenue. Thus, in 1772 the company appointed William Makepeace Thackeray as the collector of Sylhet.^[25] The collection of revenue from lime trade suffered a loss due to the obstruction by the Jaintia king. Therefore, in 1774 the British government send Captain Elliker to subdue the Jaintia king. Finally, a peace treaty was signed between the Company and the Jaintia King on 12 June /1774. The Jaintia King agreed not to stop the Company boats that ply through the Surma River.^[26]

As the British Government failed to ensure the smooth collection of revenue from foothills of the Khasi-Jaintia, they therefore, replace Robert Lindsay in place of Thackeray as the new Collector of Sylhet. Lindsay, was able to put an end to the intrusion of the highlanders who used to raid the plains of Sylhet. Thus, by 1780 Lindsay was able to collect the revenue from lime traders and other business activities smoothly. Similarly, Lindsay was able to bring the French merchants like De Champigny, Mr. Sarkies an Armenian, Greek Merchant like Constatine Parthenio and others Indian as well as directly under the control of the English East India Company. As the consequence the revenue of the company increases^[27]. However, as the highlanders had come into a close contact with the French and others Europeans, Lindsay put a check on them by introducing the Parwana or a pass which is a must for any merchants to possess in order to carried on any commercial activities at the foot hills of the Khasi Jaintia hills.^[28]

By the end of the eighteenth century and in the early phase of the ninetieth century limestone trade was a flourishing

business activity. Many traders arrived at the foothills of the Khasi-Jaintia-the Pandua region, therefore, the new collector of Sylhet J Willies reported to the Governor-General-in-Council to impose strict movement of the lime merchants. Thus, the British government regulate the movement of the merchants by the Regulation of 1790 and 1799.^[29] The Regulation of 1790 and 1799 though it checks the movement of traders to venture beyond the upper part of the river Surma, yet it opens for many merchants to invest in the lime trade. Some of the new traders were William Robert Raiit, Thomas Raiit, Mathew Richard Smith, Theodore Havell and others. However, among all the merchants it was George Inglis and Henry Thomas Raitt who took the lead in launching a Joint Stock known as the Raitt-Inglis & Company established in 1794 took the steps to monopolise the lime trade.^[30]

By the beginning of the ninetieth century the Raitt-Inglis & Company began to dominate the lime stone trade. The British Government under Lord Wellesley on May 14th 1801 direct the Raitt-Inglis & Company to supply limestone for two years to the Government from 1801-1802 in which the total quantity of limestone was 80, 000 muunds.^[31] As a consequence, it paves the way for the Raitt-Inglis and company to gain control over the lime stone trade. Later on, the Raitt Inglis & Co, got the protection from the Sylhet Magistrate, James Ewing who granted them with the exclusive right to supply lime stone to the British government at Calcutta.^[32] In 1816 Henry Thomas Raitt passed away and his wife, E. Raitt became the joint proprietor of the Raitt-Inglis & Co. However, in 1819 she sold the entire stock-share of the company to George Inglis. Thus, in 1819, George Inglis became the sole proprietor of the company and the Raitt-Ingliss & Company was renamed as the Inglis Company.^[33] During the Burmese invasion of Assam in 1824 and the subsequent signing of the Treaty of Yandaboo in 1826, the limestone trade remained unaffected. After Assam came under British control, the British government sought to connect the Surma Valley in Sylhet with the Brahmaputra Valley by constructing a road through the Khasi Hills. To facilitate this plan, on November 15, 1823, the British government appointed David Scott as the Agent to the Governor of the North-East Frontier. His primary task was to suppress the Khasi rebellion led by U Tirot Sing, whose resistance posed an obstacle to British expansion. In 1830, with the assistance of Henry Inglis, David Scott successfully captured U Tirot Sing, bringing the Khasi Hills under British government.^[34]

When the British annexed the Khasi Hills, they did not directly interfere in their administration. Therefore, in 1835, the British Government appointed Captain Lister as the Political Agent in the Khasi Hills, granting him the position of a Magistrate with both judicial and executive powers. However, Captain Lister found his duties overwhelming, as they encompassed both civil and military responsibilities. Consequently, he requested the Governor-General-in-Council to appoint his son-in-law, Henry Inglis, as the Assistant Political Agent. In response, on 11th February 1835, Henry Inglis was officially nominated as Captain Lister's assistant.^[35]

Subsequently, Henry Inglis became the sole proprietor of the Inglis Co after the death of his father George Inglis in 1840. Furthermore, his marriage to Sophia the daughter of Captain Lister enables him and the Inglis & Co to gain control over most of the limestone quarries in southern region of Pandua and Luar hills.^[36] In the Jaintia Hills.^[37] Based on Mills' report, the British government decided in 1857 that all

limestone quarries in the Jaintia Hills would come under its control. [38] Based on Mills' report, the British government decided in 1857 that all limestone quarries in the Jaintia Hills would come under its control. [39]

By the end of the nineteenth century, the limestone trade began to decline, and most traders shifted their business activities to other valuable commodities such as oranges and coal. Furthermore, the Great Earthquake of 1897 devastated the once-lucrative limestone trade. Nonetheless, at the beginning of the twentieth century, the British government, in an effort to revive the limestone trade, reopened all the limestone quarries in the foothills of the Pandua region. However, the limestone trade from this region, which once supplied Calcutta and other parts of Bengal and India, had now been replaced by limestone from Kunte. Inglis & Co., which had once supplied limestone to the British government in Calcutta, was replaced by Messrs Burn & Company. [40] To conclude, it is important to note that the local markets situated at the foothills of the Pandua and Laur regions, once simple tribal markets, became linked to the national market in Bengal through the limestone trade. However, the arrival of European merchants and their investment in the lucrative limestone trade integrated the tribal economy into the national economy and, eventually, the global capitalist market. Following decolonization, many former colonies, including those in the Third World, found their economies classified as underdeveloped. [41] Thus, the tribal economy, once self-sufficient, was dismantled with the advent of colonial rule. In the twenty-first century, limestone trade in the foothills of the southern region of the Khasi Hills has been halted by an order from the High Court of Meghalaya, acting on behalf of the National Green Tribunal.

Conclusion

The limestone trade from the hills dominated the markets in Sylhet, Calcutta, and even at the national market. However, despite its lucrativeness, the economy of the Khasi-Jaintia region remained stagnant. The economic structure in the hills exhibited a dual nature—while the British government and European merchants amassed significant profits from the limestone trade, they never contributed to the region's development or invested in the welfare of the Khasi-Jaintia people. It is important to note that, despite limestone extraction, the topography and environment of the region in those days were not severely impacted, as the extraction process followed simple traditional methods. However, in the later part of the twentieth century, the National Green Tribunal had to introduce rules and regulations to govern limestone extraction. These measures were necessary to protect the fragile environment from the destructive effects of excessive explosives used in modern mining. Therefore, the government of Meghalaya must enact laws requiring all limestone traders to adopt scientific methods for extraction and processing. Additionally, the government should regulate the limestone trade to generate substantial revenue by exporting it to neighbouring states like Assam and Bangladesh. Overall, British colonial policies clearly demonstrate that their primary intention in colonizing the Khasi-Jaintia Hills was to exploit its resources for the economic benefit of the British government, leaving a lasting impact on the region's economy.

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