Archaeology of Sikkim - Darjeeling Himalayas

A Thesis Submitted in Partial Fulfillment of the Requirements

for the Award of the Degree of

Doctor of Philosophy

Submitted by

Upasna Chettri

(Registration No: 186141108)

Department of Humanities and Social Sciences

Indian Institute of Technology Guwahati

Assam – 781039, India

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Dedicated to Mom and Dad

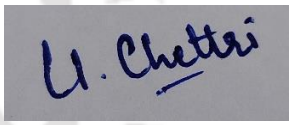
(आमा र बुवालाई समर्पित)

DECLARATION

I hereby declare that the thesis entitled ***"Archaeology of the Sikkim-Darjeeling Himalayas"*** for the degree of Doctor of Philosophy is a result of the original research work carried out by me in the Department of Humanities and Social Sciences, Indian Institute of Technology Guwahati, under the supervision of Prof. Sukanya Sharma. The work has not been submitted either in whole or in part to any other university or institution for a research degree.

Date: 13.02.2025

Place: Indian Institute of Technology Guwahati



(Upasna Chettri)

CERTIFICATE

This is to certify that the doctoral thesis entitled ***"Archaeology of Sikkim-Darjeeling Himalayas"*** submitted by Miss Upasna Chettri for the degree of Doctor of Philosophy in Archaeology in the Department of Humanities and Social Sciences at Indian Institute of Technology embodies original research work carried out under my supervision and guidance. The thesis has not been submitted either in whole or in parts to any other university or institution for the award of any degree. All assistance received by the researcher during the research have been duly acknowledged.

Sukanya Sharma

Date: 13.02.2025

Prof Sukanya Sharma

Thesis Supervisor

Prof. Sukanya Sharma

Department of Humanities and Social Sciences

Indian Institute of Technology Guwahati

Guwahati-781039

Assam, India

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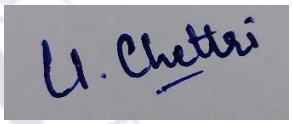

Upasna Chettri

Abstract

This study is undertaken in Sikkim-Darjeeling Himalayas. The archaeological evidences investigated are Megaliths and Pottery. Pottery is collected mainly from the region of Daramdin in Soreng district in Sikkim whereas Megaliths are documented from different parts of Sikkim-Darjeeling Himalayas. The pottery samples have no identifiable signature but the megaliths in the form of menhirs- locally known as *Longchoks* have existed in the landscape in various contexts serving different functions. The central objective of the thesis is to explore the material remains and anthropogenic markers of the past found in the study region. For that, the study aims to document the archaeological evidence in Sikkim and Darjeeling while mapping the continuity of the the use of megaliths in the study area and investigating the provenance of the pottery. The study hypothesises that Sikkim had a megalithic culture and the existence of a pottery tradition in Sikkim and Darjeeling. In order to investigate the objectives of the study, the methodology opted is desk based assessment along with archaeological and ethnographic investigation for the recording and documentation of the archaeological evidences. For the analysis of the evidences, two different approaches were used.

The study of the megaliths of Sikkim-Darjeeling Himalayas highlighted various practices surrounding these structures and their significance for cultural continuity. They were discussed against the wider context of megalithic cultures of the neighbouring regions. The pottery samples were analysed using the scientific analytical methods to understand the provenance, manufacturing techniques of the pottery and the chronological placements of charcoal found in association with the pottery. The methods used are powder X-Ray Diffraction (pXRD), Energy Dispersive X-Ray Spectroscopy (EDX), Fourier Transform Infrared Spectroscopy (FTIR), Thermogravimetric

Analysis – Differential Scanning Calorimetry (TGA-DSC) and 14C dating using Accelerator Mass Spectrometry (AMS).

The findings however indicate that in Sikkim-Darjeeling Himalaya, the megaliths served different functions like landscape indicators and commemorative stones but were conspicuous by their absence as funerary monuments. This is in alignment with the megalithic traditions of Tibet where megaliths often assumed functions like ritual monuments or way finders along passes and mountains. The megalithic culture had a distinct nuance of its own where a single monument holds much power and command over the landscape as well as the memory of the people that folktales, legends and narratives are weaved around it. There is continuity of material evidence amidst changes in the narratives, beliefs and customs which have undergone transformation.

With regard to pottery sherds documented from Daramdin and analysed using scientific techniques, this study confirms that Sikkim did have a tradition of manufacturing pottery. The analysis further suggests that in West Sikkim, pottery was produced in the same region as there was a match in the elemental and mineralogical composition of the soil of the region and the pottery sherds. Furthermore, the charcoal found in association with the pottery sherds, on analyzing with 14C (using AMS) analysis provided a time frame ranging from 199 BCE to 1640 CE.

Therefore, a major contribution in the region's archaeology is that the AMS dates of charcoal samples provide us with a chronological framework that has not been previously established. The findings indicate that human activities were present in the region as early as 199 B.C.E, thereby contributing significant insights into the prehistoric timeline of the area while also stressing on the aspects of crafts like pottery production which were categorically denied by previous studies.

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Chapter 1

Introduction

Sikkim is a state in the Northeastern part of India which at present borders three international territories and the State of West Bengal. It was an independent country until 1975, when it was integrated into India as the 22nd state. Owing to its strategic location, historically, numerous trade routes passed through Sikkim thereby connecting South Asia to Central Asia (Roy Burman, 2015, p. 1). Sporadic references tell us of the frequency of this route. Subba (2008, p. 102) mentions that open movements of merchants and yak herders from Chho Lhamo and Lhonak Valley into Tibet and back through Nyima La or Naku La pass in the "olden times" fostered cross breeding and interdependence of socio-cultural relationship with regard to marriage, trade and religion. Madanjeet Singh (1971, p. 233) mentions that after Nalanda University was razed to ground in the hands of Bhakhtiyar Khilji in the year 1193, hundreds and thousands of Monks were slain and many of the surviving Monks fled to Tibet. He mentions the name of one Sakyashri, a Kashmiri Monk, who at first having fled to Jagadalla Monastery in Odisha, made his way to Tibet possibly via Chumbi valley in order to avoid the perilous situation in the then Bengal. Although the sources of this claim have not been mentioned by the author, Chumbi Valley finds mention in the narratives time and again with regard to being a passageway between two mighty kingdoms – Tibet and India. However, its strategic position has also been hailed as Sikkim's misfortune for it was susceptible to constant interventions by the neighbouring powers therefore defying her 'splendid isolation' (Rustomji, 1971, p. 240; Karan & Jenkins, 1963, p. 56)

Darjeeling was a part of Sikkim until 1835 when the deed of grant was signed between the officials of British East India company and the Chhogyal of Sikkim owing to which the land between Mechi

and Teesta, which corresponds to present day Darjeeling District was granted to the British (Dasgupta, 1999, p. 51).

Despite being a passage between mighty cultural entities on all sides and rich historical developments during the dynastic rule of the Chhogyals of Namgyal dynasty (1642-1975 CE), the archaeology of Sikkim is at a nascent stage of investigation. Besides the Bhutias, there were other indigenous groups of people already inhabiting the region – The Lepchas who were swidden cultivators and moved around the region, spanning over Sikkim – Darjeeling Himalayas and the region of Eastern Nepal known as Ilam. The Lepchas have a rich repository of oral traditions and oral literature which have passed down and around vertically and horizontally across generations. This oral literature bears witness to the geographical, historical and cultural nuances as well as gives an idea about the material culture in use in the past.

Map 1. Map showing the study area – Sikkim-Darjeeling region

1.1. Geography of Sikkim-Darjeeling

Sikkim occupies a significant geo-political space at the crossroads of four powerful nations – China (formerly Tibet) in the North, Bhutan in the East, India in the South and Nepal in the West. Its elevation ranges from 270 to 8,578 meters above MSL (Karan, 1989) and encompasses an area of 7,299 square kilometers (Sharma, 1996). It lies between 27°5' North to 28°10' North Latitude and 88°4' East to 88°58' East Longitude (Risley, 2020/1928, p. 1). The entire state is divided into five zones (Singh, 1992, p. 1) viz:

1. Lower Hills which range from 300-1500 meters above MSL
2. Middle Hills which range from 1500-2000 meters above MSL
3. Higher Hills which range from 2000-3000 meters above MSL
4. Alpine zone at 3000 meters above MSL with sparse vegetation
5. Snow Mountains above 3000 meters above MSL where vegetation is completely absent.

The state boasts of lofty peaks, passes, rivers and glaciers, the chief sources of freshwater. Out of the eleven majestic peaks of Sikkim, Mount Kanchenjunga commands the highest attention due to its sublimity and sanctity. Kanchenjunga is deemed sacred and is worshipped by the Lepchas and Bhutias alike. The Lepchas call it *Kingtsoomzaongboo Choo* or *Kongchen Konglo,* which means "highest veil of ice", and the Tibetans call it *Gangs-chen mdZod-Inga,* which translates to "the five treasures of the eternal snow" (Nebesky-Wojkowitz, 1957, pp. 29-30).

From the Eastern part of the Singalila range, which forms a natural barrier between Sikkim and Nepal, rises the Kanchenjunga range, which is of cultural and geographical significance to the inhabitants of this land. The most crucial pass in this Mountain Range is called the Chiabhanjan

which connects Sikkim with Nepal. The Chola Range on the Eastern border of Sikkim has prominent passes like Jelep-la, Nathu-la, Yak-la, Thanka-la, Kongra-la, Bamchho-la, and Sese-La, which provide direct entry and access to Tibet. Sikkim is drained primarily by River Teesta and its numerous tributaries and sub-tributaries, which count 103 in number, among which, River Rangeet is the largest and the most important. The Teesta River system is the lifeline of the inhabitants of Sikkim. It originates from Teesta Khangsa glacier, descending from the Pauhunri Peak in the North Eastern corner of Sikkim (Meetei et.al., 2007, p. 34). The landscape of Sikkim is dotted with 534 lakes, with almost every lake associated with and worshipped for their sacred credence.

1.2.History of Sikkim

The land was primarily inhabited by the Lepchas, Bhutias and the Limboos. It was known by the name *Nye Mayel Lyang* which means 'land of hidden paradise' (Tamlong, 2015, p. 12) by the Lepchas. The Bhutias, also called *Lhopos,* referred to Sikkim as *sBas yul Bras mo ljong (*pronounced as *Bayul Demazong)* which means 'the hidden valley of rice and fruits' (Arora, 2007, p. 196). The present name 'Sikkim' however, is derived from a Limboo term *Sukhim* which means 'a new house'. The name is given by the Limboo queen Thungwamukma, wife of Tensung Namgyal, the second Chhogyal of the Namgyal dynasty (Subba, 2008, p. 250). The area of Sikkim extended much beyond the present territorial boundaries during the coronation of the first Chhogyal Phuntsuk Namgyal in 1642 CE and was termed as Greater Sikkim. According to an unpublished manuscript of 'History of Sikkim' by Thotup Namgyal and Yeshe Dolma (translated by Dawa Samdup) (1908, p. 20), Greater Sikkim comprises "Dibdala in the North, Shingsa Dagpay, Walung, Yangmag Khangchen, Yarlung and Timar Chhorten in the West, down along the Arun and Dud Kosi Rivers, down to the Maha Nodi, Nuxulbari and Titalia in the South, on the

East Tagong La and Tangla in the North". A Lepcha song named *Rongsa Dungit Vam* (Ode to the origin of Rongs) (Chattopadhyay, 2013, p. 84) captures the area and the territorial boundary of *Mayal Lyang* thus:

> "Nye Mayel spreads over the hills as far as Jalousi, Peyu and Yo,
>
> With flags of triumph held aloft by Rongit, Rongnyu, Tandong and Dungit.
>
> Achyuk Menlong and others are our ancestors,
>
> Damsang, Dalin, Sadi, Sumsel and Darjeeling still proclaim her glory."

The earliest History of Sikkim is shrouded in myth and mystery. The written accounts which sporadically mention Sikkim describe Sikkim as a hidden valley and a safe haven for Buddhism. The earliest tangible remains in Sikkim are stone tools which represent the assemblage which is described as Neolithic stone tools by scholars on the basis of their stylistic attributes. However, in the 13th Century the erection and establishment of Kabi Lungchok in Kabi Village of North Sikkim, forging a Brotherhood Treaty between the Lepchas and the Bhutias can be regarded as the first historical tangible evidence which survives to this day. This event also enumerates the fact that before the coming of the Tibetans, the land was already inhabited by people. Chronologically speaking the next tangible evidence of the presence of human activity is represented by the coronation throne of the 1st *Chhogyal* of the Namgyal Dynasty, Phuntsuk Namgyal in Yuksom, in West District of Sikkim in the year 1642 C.E. Post that, there are various palaces and Buddhist Monasteries, affiliated to different sects of Vajrayana Buddhism established in the region.

The second treaty comes in a form of a document known as *Lho-Mon-Tsong Sum* which was signed in the year 1663 in a place called Saplakhu, Tapleyjung in Eastern Nepal (McKay, 2021, p. 18; Subba, 2020, p. 38). It was signed between the *Lho-pa* (Bhutia), *Mon-pa* (Lepcha) and *Tsong-pa*

(Limbu). After Chhogyal Phuntsuk Namgyal was crowned as the first monarch of Sikkim in 1642, there is said to have been revolts by the Lepchas and the Limbus denying the suzerainty of the 1st Chhogyal Phutsuk Namgyal (Mullard. 2011, p. 145). After careful negotiation, a tripartite treaty was signed between the chiefs of the three communities known as *'Lho-Mon-Tsong-Sum'*. The Limbu community abound the Western part of Sikkim and Eastern part of Nepal. The region is collectively known as Limbuwan.

However, before 13th Century the description of the geography, history and the people of Sikkim is found in oral literature and is regarded as mythical. For instance, the travel narratives of Guru Padmasambhava and the fact that he consecrated many holy places within Sikkim, on which later the important Buddhist monasteries were built, have highly been circulated among the believers of the faith. This, nevertheless, cannot be definitively established due to lack of concrete tangible and documentary evidence(s).

1.3.Previous Archaeological work in Sikkim

Archaeological investigations in Sikkim started from late 1960s. Before that British political agents and anthropologists (Risley, 1928/2020; Stocks, 1925/2001; Nebesky-Wojkowitz, 1957) reported findings of stone tools and remnants of pottery. Therefore, to understand the occurrences of this evidence, explorations were conducted in parts of Sikkim by Archaeological Survey of India and independent archaeologists from Nepal (Bannerjee and Sharma, 1969; Banerjee, 1983; Mishra, 2008, Tiwari (Ed.), 2016a, Tiwari (Ed.), 2016b). These explorations were mainly directed towards finding stone tools from across the explored regions, which resulted in the discovery of several sites from all districts, especially North and East Sikkim. The exploration yielded a variety of stone tools like axes, adzes, harvesters, perforated celts, polishers and knives (Bannerjee and Sharma, 1969; Banerjee, 1983; Sharma, 1996; Mishra, 2008; Tiwari (Ed.), 2016a; Tiwari (Ed.),

2016b). The tools typologically belong to the Neolithic period, whereas the potsherds have no 'identifiable signature'. The 'megaliths' belong to a tradition which commemorated the dead in 'stone' but has also been known to commemorate other events. As regards the presence of pottery, according to A.K Sharma, there is no evidence of pottery in Sikkim, possibly due to the lack of 'proper earth' for the manufacture of ceramics and difficult terrain for making kilns. However, Stocks (1925, p. 477) mentions that only crude black plates were produced in Sikkim by the Lepchas whereas other varieties were imported from places like Nepal.

1.4. Archaeological Evidence Documented and Studied in this Thesis

1.4.a Megaliths

The Megaliths in the region are at present found in a myriad of contexts. The erection and veneration is generally ascribed to the Lepchas. Therefore, certain spots where the megaliths stand are considered sacred by the Lepchas whereas others are considered sacred by the Nepalis by establishing a shrine in accordance to their beliefs. In addition, some megaliths are distributed across the landscape without having liturgical connections while some are remembered as sites of historical significance. Some prominent megalithic sites documented in the course of this study are:

Tendong Megalith positioned atop a Hill called the Tendong Hill at 27°12'21"N, 88°24'28"E in Namchi District in South Sikkim, is popular for the celebration of a festival called *Tendong Lho Rum Faat,* by the Lepchas. To Reach Tendong Hilltop, one has to trek 6 kilometres through a thick forest. The starting point of the trek is Damthang village which is 13 kilometres from Namchi, the district head quarter of South Sikkim District.

Following this, Kabi Lungchok in the village of Kabi in the District of North Sikkim (GPS co-ordinates: 27º 23'33"N, 88º36'34"E) is historically significant for the erection of a megalith commemorating 'The Blood Brotherhood Treaty' between the Lepcha Chieftain and a Tibetan leader in the 13th Century. There are numerous stones placed haphazardly at the spot which at present is seen adorned with colourful *Khada,* Tibetan silk scarf. The site lies right next to National Highway 310A, 17 kilometres north to Gangtok, the capital of Sikkim.

Sokpa Dhunga, a megalith, marked by co-ordinates 27°10'39.924" N and 88°4'28.698" E is located in Samanden, Darjeeling District, West Bengal. It lies 80 kilometres from Darjeeling and is situated close to River Rammam. River Rammam is an important tributary of River Rangeet. The local beliefs ascribe the *Sokpa Dhunga* to have been a boundary marker between habitable land and a forest land in deep time.

Furthermore, at the centre of Darjeeling town, on a hill known as The Observatory Hill or Mahakala Dara (GPS co-ordinates: 27º02'51" N, 88º16'04" E), stands the Mahakala Temple. Inside its sanctum sanctorum lies a figure worshipped as an embodiment of Mahakala at present. In the past, however, it was a megalith worshipped by the Lepcha community. The site is regarded as one of the most sanctified spaces for Hindu and Buddhist rituals.

Thereafter, In the village of Tikpur, in Soreng District of Sikkim (GPS: 27°7'52.74" N, 88°7'34.08" E), an elderly gentleman of 71 years old pointed towards short stones erected on an agricultural terrace. These were stones erected during *Udhauli Ubauli Pooja* previously performed. The stones worshipped during this ritual is not a permanently erected megalith but, it is erected everytime the ritual is performed.

Yet again, in Soreng District, Sikkim, there are sites where megaliths once stood but are no longer present. According to local accounts, these structures were visible until they were destroyed by flash floods and landslides. One such spot is in Lungyam village, situated 19 kilometers from Tikpur, with GPS coordinates 27°7'2.448" N, 88°9'51.576" E. The spot is located on the banks of River Rammam which is also the natural boundary between Sikkim and West Bengal.

1.4.b. Pottery

Pottery remnants, both on the surface and in buried contexts, have been identified in Daramdin, located in Soreng District, Sikkim. At a specific site called Chyandaara, pottery sherds are scattered across an agricultural field. While no other locations currently exhibit visible pottery, accounts from local inhabitants describe past discoveries of pottery in and around Daramdin during activities such as construction or road building. These narratives provide valuable context for understanding the distribution of pottery in the region. The pottery in the buried context was accompanied by five charcoal samples at different depths for which AMS dates have been obtained which range from 199 BCE to 1640 BCE.

Regarding the different kinds of artefacts mentioned above, the megaliths, which although are rarely erected currently exhibit continuity in their usage and symbolic remembrance whereas in the case of the pottery sherds, we find no ethnographic parallels at present.

1.5.Scope and objectives of the research

There are various studies conducted on the Lepcha ways of life yet the past is recollected only through myths, legends or fables. As seen in the previous section, archaeological exploration in Sikkim is mainly concentrated in North and East districts of Sikkim and focused on stone tools.

Although stories and colonial accounts of the Lepcha ways of life are replete with the concept of earthen pots, previous archaeological explorations have categorically denied their existence citing the presence of harsh terrain (Sharma 1996). Furthermore, the megalithic structures in the region too which finds mention in the beliefs and stories of the Lepcha community, are merely mentioned in passing, without due consideration of their significance as critical evidence of past societies and their cultural practices. Therefore, taking forward the investigation, the central objective of the thesis is to explore the material remains and anthropogenic markers of the past found in the study region. They are enumerated as follows:

1. The study aims to document the archaeological evidence in Sikkim and Darjeeling.
2. The study aims to map the continuity of the megalithic tradition in the study area
3. The study seeks to understand the provenance of the pottery.

1.6. Research Questions

Based on the objectives, the research questions are formulated:

1. What is the archaeological context of this material evidence recovered from the study area?
2. Can this material evidence establish the continuity of megalithic tradition in Sikkim and Darjeeling?
3. What is the provenance of the megaliths and pottery of Sikkim and Darjeeling?

1.7. Research Proposition

Positioning Sikkim at the centre, we see the practice of megalithism by various communities of North East India (Marak and Jangkhomang, 2012; Sarma, 2014), which lies to the east of Sikkim. To the West of Sikkim, in Jharkhand mainly, the cultural practices of Ho, Munda and Santhal indigenous people too are deeply rooted in megalithism (Shekhar et. al., 2014; Shekhar 2017; Shekhar 2022). The evidence of megaliths, the stories associated with them and the cultural practices commemorated by the Lepchas to this day lead us to hypothesise that Sikkim had a megalithic culture.

On the other hand, regarding the pottery sherds, though there is a dearth of ethnographic parallel at present, the accounts of the colonial officials and folktales of the region point towards the existence of pottery. In the Indian Archaeology - A Review 1980-81 (1983, pp. 64), the section on the exploration of Sikkim mentioned that no pottery tradition existed in Sikkim as "in such a landscape one does not expect proper earth for the manufacture of pottery". However, in this study, sites with pottery in buried context have been identified including surface and sub surface context. Therefore, this study proposes the existence of a pottery tradition in Sikkim and Darjeeling.

1.8.Investigating the proposition – Methodological considerations

Sikkim remains sparsely investigated within the field of archaeology, with limited archaeological investigations conducted thus far. Therefore, any material remain(s) that are identified or collected is analysed in the context of present day usage or the knowledge which has been passed down from generation to generation.

In order to identify the potential site(s) of archaeological importance, exploration was conducted in and around places which were mentioned in the folktale. In order to understand if the remains

are still in use, and if not, to explore the collective memory of the people concerning those material remains, interviews - mostly unstructured in the form of casual conversations and some semi structured interviews were conducted.

1.8.a. Desk based assessment

Before venturing out into the field, a subsequent amount of time was dedicated to desk study, which consisted of reading literature mostly secondary literature. This included collections of published books, articles in various journals, reports in newspapers, census reports and unpublished thesis in English and regional language. A thorough read on the previous archaeological investigation on Sikkim, the oral traditions and folktales of the region, with a special focus on Lepcha community and the anthropological accounts of European travellers and officers was done. This gave us an idea about the names of the places, objects, sites and practices which in the recent times may have become redundant. A study of the secondary literature on oral traditions and the ways of life of the indigenous people was done thoroughly.

Visits to libraries and museums became imperative in order to find books, journals and reports which dealt with regional histories and cultures that are written in English and regional language. The local museums were beneficial as they housed artefacts and objects specific to that region. For this study, a visit to Namgyal Institute of Tibetology in Gangtok was beneficial as the largest library and museum of Sikkim are located in the same vicinity. The library consists of rare books, old manuscripts and documents which are accessible to the public. The Lepcha Museum in Kalimpong which is a huge repository of books and objects specific to the Lepcha community is beneficial in knowing the kind of objects which were once used by the community but is now no longer in use.

1.8.b. Archaeological exploration

The study of the past is indeterminate. A "cheap, quick, and relatively non-destructive" method of conducting archaeological research is reconnaissance survey, as opposed to excavation which necessitates substantial financing, labor-intensive physical work, and the destruction of the site (Renfrew and Bahn, 2016, p. 73). It involves surface survey, which examines visible features on the ground, as well as sub-surface testing, which delves beneath the surface to uncover buried remains. This approach allows archaeologists to gain an understanding of the archaeological potential of a given area without resorting to extensive and expensive excavation efforts. Furthermore, an area with scattered and sporadic remnants may not fit within the category of being called a 'site' which, nonetheless, hold significance in terms of locating human activities in the landscapes. They have been termed as "off-sites" and "non-sites" (Renfrew and Bahn, 2016, p. 75-77). The focus of archaeological survey of sites with high artefact density have given way to survey of regions with "isolated artefacts and low density scatters" (Schiffer, Sullivan and Klinger 1978). By incorporating off-site and non-site analysis into archaeological investigations, researchers gain a more comprehensive understanding of past human behavior and their interactions with the landscape.

In such a situation, non-probabilistic sampling in the form of purposive technique seems apt. Although purposive sampling comes with its own set of follies with regard to representativeness of the artefacts, nonetheless, with regard to discovery of non-sites, it does offer advantageous results with lesser effort in terms of manual labour and cost efficiency (Schiffer, Sullivan and Klinger 1978, 5).

Daramdin is a flatland surrounded by natural features such as hills and forests. The landscape is relatively easy to traverse, except, most of that was aerable land which is cultivated throughout the

year with saeasonal crops like maize, buckwheat, potato and paddy, Therefore, the challenges of visibility and accessibility of the artefactual remains posed problem while surveying the region which has thick vegetation, agricultural fields and densely packed villages. In order to mitigate this problem, pedestrian survey technique which involves walking over the surface of the landscape is employed to enhance visibility and locate artefacts. Moreover, a strategic implementation of purposive sampling with the help of place-name evidence as well as interviews of the inhabitants of the region acquired through snowball sampling method yielded desirable results in the form of pottery sherd scatters in the spot known as Chyandaara in Daramdin. Local inhabitants play a major role in finding spots and sites of the past since they are well acquainted with the geographical and geological features of the area and artefactual remains in the landscape (Schiffer, Sullivan and Klinger 1978). Moreover, place names are vital as they are encapsulated in the social discourses and act as mnemonics for the actions of individuals and groups (Tilley, 1994, p. 18).

Drawing on a similar methodology by using select Lepcha folktales as documentary sources for place-name evidence, these folktales associated with the place provided insights into locales and material culture. Specific places and objects that were once used by people in the past were identified. Using this information, surveys carried out in the nearby region led to the selection of Daramdin as one of the study sites. Initially, studying the landscape involved closely observing the ground surface as a method of pedestrian survey to understand how artifacts, archaeological signs, structural remnants and natural features are distributed in the area (David 2006, p.9).

As regards the megaliths, the knowledge of their existence in some cases like the Lungyam megalith and *Sokpa Dhunga* and Devithanas were learned during casual conversations with the inhabitants in and around Daramdin whereas there was prior knowledge of the existence of

megaliths in Tendong Hill and Mahakala Temple which though has immense customary value for the Lepchas of the region has been rarely engaged with in academic discourses. Moreover, Kabi Lungchok being of historical significance finds mention in the historiography of Sikkim (Namgyal and Dolma 1908; Mullard 2011)

1.8.c. Ethnographical methods

Ethnography captures people in their natural settings. The intersection of archaeological and ethnographical methods become important to understand the context and use of certain materials which have persisted till present. Moreover, collective memories of certain material aspects which are no longer in use but remain in the landscape are also exemplified by ethnographic interviews with the inhabitants of the place. In the process, beyond providing insights into the material remnants, the associated legends and folktales concerning the material remains and the landscape were told thus, enriching and corroborating our understanding of the already known folktales.

The sampling method employed was snowball technique since this study is explorative in nature, it provided an informal way of approaching the respondents (Atkinson and Flint, 2001. pp. 1). This method was undertaken where the respondents directed the researcher to other respondents who were presumed to have more knowledge about the particular topic (Handcock and Gile, 2011, p. 369). Since the researcher ventured into the field with no prior personal contacts, snowball sampling method helped engage with diverse set of respondents eliciting varied responses (Noy, 2008, p. 327-344).

The key ethnographic method used in this study is interview method. Among predefined methods of interviewing, unstructured and semi structured interviews was mostly used. Unstructured interviews are open ended and conversational style interviews where the interviewee is given the

time and space to talk at length about the topic the researcher wants to know about with minimum influence of the researcher (Hammersley and Atkinson, 2007, pp. 101). This was done to elicit as much information regarding the material remains, the collective memory about the material remains and the beliefs and discourses of the local residents. Moreover, conversational style discussions are great at building rapport and trust with the interviewee which is needed to prompt genuine answers from the interviewees. For instance, to understand the functions and practices centered around *longchoks*, interviews were conducted with the purpose to understand its present usage and significance. The *longchoks* that are documented were unaccompanied by any other material remains therefore, they had to investigated from an ethnographical point of view.

However, the conversational style interviews could sometimes lead the interviewee astray from the topic of interest into an entirely unrelated conversation. For this reason, the discussion is usually pre-structured where the researcher would introduce various issues or topic of interests to be discussed and then leave it to upon the interviewee to take forward the topic. The same issues/questions were discussed with different individuals, not necessarily in the same style or same order of things since, some interviewees were not comfortable having conversations with a female 'stranger'. In such a situation, semi-structured format usually helped in order to avoid awkward pauses in between conversations. There were times when field note book, camera and the questionnaire rendered the interviewee nervous that they passed on the question to their nearest kin or neighbour.

Furthermore, in the following chapters, direct translations of the conversations and interviews conducted by the researcher with the respondents of the study area are provided. The translations are done by the researcher herself since they were carried out in her mother tongue, Nepali.

1.8.d. Scientific Analysis of Pottery and Soil Samples

The archaeological pottery of Sikkim remains largely unexplored. Consequently, pottery sherds discovered in Daramdin lack comparative frameworks for the evaluation of their form, color, and texture, and other essential elements in discerning manufacturing techniques, provenance and relative chronology. Given the dearth of prior investigations or literary references, such as historical accounts, the scientific analytical methods are instrumental in facilitating the analysis of pottery sherds. By applying this systematic methodology, researchers can elucidate various dimensions of pottery production and distribution in this area.

Therefore, the objectives highlighted in this section are as follows:

- To understand the provenaence of the pottery sherds as to whether the pottery was produced in the region that they are collected from.
- To understand the manufacturing techniques of pottery production especially its firing temperature and firing conditions.
- To determine the chronological placement of the artefacts – pottery sherds

To find answers to the questions above, the methods like Powder X-Ray Diffraction (pXRD), Energy Dispersive X-Ray Spectroscopy (EDX), Fourier Transform Infrared Spectroscopy (FTIR), Thermogravimetric Analysis – Differential Scanning Calorimetry (TGA-DSC) and Radiocarbon dating using Accelerator Mass Spectroscopy (AMS) has been used.

1.9.Structure of the thesis

Based on the objectives, hypothesis and methodological considerations, the chapters in the thesis are arranged accordingly.

1. Chapter 1 introduces the study by defining the study area. It also discusses the previous archaeological studies undertaken in the region and outlines the scope and objectives of the research along with the research questions and the research proposition. Based on this, the methodology and methods used for the study is discussed. The chapter ends with the structure of the thesis.
2. Chapter 2 explores various megalithic structures in Sikkim-Darjeeling region and records the detailed practices and beliefs associated with them.
3. Chapter 3 details the exploration of pottery samples in Daramdin, Soreng District of Sikkim with the help of the names mentioned in the folktales, previous accounts by colonial administrators and scholars coupled with the present day accounts of the inhabitants of the region.
4. Chapter 4 discusses and analyses the roles and functions of the megaliths, corroborating them against the wider backdrop of the megalithic cultures and traditions of North East India, Eastern India (especially Jharkhand) and erstwhile Tibet.
5. Chapter 5 analyses the pottery samples using various scientific methods to discern manufacturing techniques and provenance of the pottery sherds. The chapter also discusses the 14C (using AMS) analysis of the charcoal samples to ascertain the time period of the charcoal samples associated with the pottery sherds.
6. Chapter 6 gives an overview of the study highlighting the key findings, limitations of this work and the way forward.
7. Following the main chapters there are seven appendices in the thesis which outline important contextual information which are associated with the evidence or their analysis but could not be accommodated in the main chapter

8. A glossary of local words is attached in the thesis which becomes important to undertand the terms and concepts in the local context.
9. The thesis ends with a list of references which have been cited in the body of the text.

CHAPTER 2

Megaliths of Sikkim – Darjeeling Himalayas

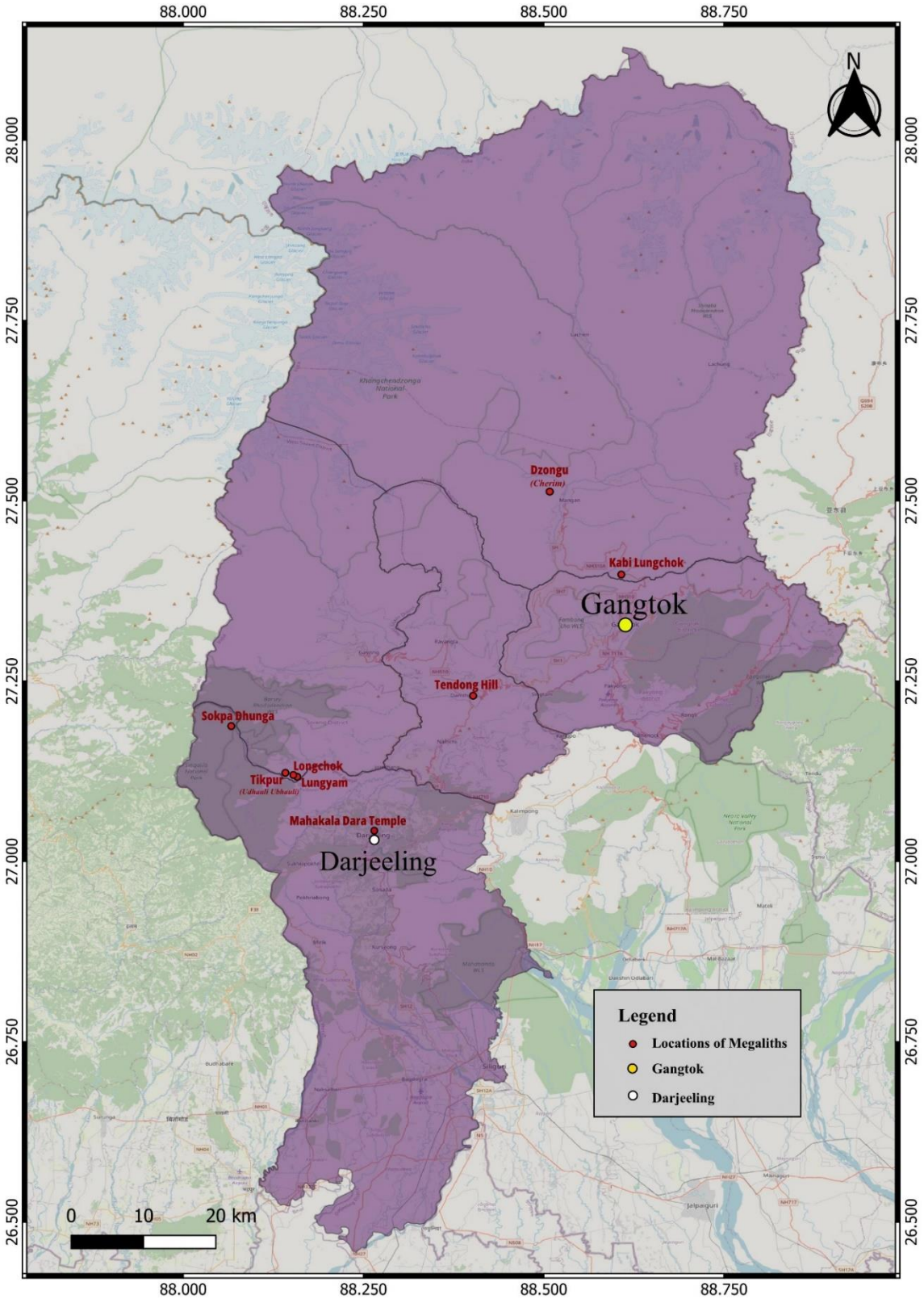
2.1. Introduction

This chapter examines the significance of *Longchoks* (megaliths) of Lepcha culture, highlighting their roles as markers in the landscape and elements of cultural and ritualistic practices. The chapter also emphasizes upon their continued relevance in the socio-cultural context of the Sikkim-Darjeeling Himalayas.

The concept of *Longchoks* or megaliths requires much attention from the scholars. As one of the important markers of *Lepcha* cultural heritage, *Longchoks* served as a way to honor departed ancestors or mark their resting places. They served as tangible representations of reverence and protection, while also demarcating boundaries or commemorating remarkable events. However, their purpose extended beyond commemoration and held multifaceted roles encompassing commemorative, dedicative, and ritualistic functions. Scholars like Molommu (2018, p. 15) and Chattopadhyay (2013, p. 26) assert that the essence of erecting *Longchoks* was to replicate the presence of Kanchenjunga, revered as a vital source of life and protection. Bain (2022, p. 20) sheds light on the fact that when Kanchenjunga was not visible from certain places, inhabitants would create it by erecting a stone representing Kanchenjunga. Additionally, *Longchoks* also functioned as boundary markers or landscape indicators as evidenced from their presence on the frequented routes. However, due to several reasons, the existence of megaliths in Sikkim and Darjeeling Himalayas, where the Lepchas abound, are diminishing (Marak, 2023, p. 328). Development initiatives and lack of awareness have contributed to this decline and the sites today are adorned with signs and symbols in a disparate context. Extracting from this premise, there are a few evidences from across the study area in the form of names, or material remnants or memories of

the residents, and certain beliefs and rituals which show the significance of *longchoks* as a geographical marker, a landscape marker and a cultural marker.

The megaliths and erected stones in Sikkim-Darjeeling Himalayas are scattered on the landscape, some are embedded in the memory of the inhabitants and some are repurposed to be used/venerated in a different way which are actively utilized even to this day. The *Sokpa Dhunga* in Samanden talks about conflict between two groups which resulted in the erection of stone for the demarcation of a boundary between a settlement and a forest. On the other hand, the stones which are worshipped and the rituals performed during *Udhauli Ubauli Pooja* highlight the phenomena of intermingling of cultural knowledge and practices in a spatial context. It also sheds light on stones being used as a principal marker in the landscape and possibly a pathfinder. The stones that are worshipped in Devithanas however exhibit elements of continuity in the use of material remains in a different cultural and religious context emphasizing on the various socio-cultural politics of the region. A respondent from Siktam, West Sikkim informs that the *longchoks* were erected and worshipped until 'recently' and that they are not known as '*longchok'* in other language. The Nepalis called them by the name *Devithana.* However, it was generally believed that the stones were erected and venerated as sacred objects in (what the respondent called) the 'Himalayan region' because there was a dearth of vegetation and crops for offering to the gods. Whereas, stones were abundantly accessible thus serving as an alternative means of ritual devotion. This chapter, therefore, strives to throw light on the practices practised by the Lepcha community and the importance of 'stones' in their socio- cultural milieu.

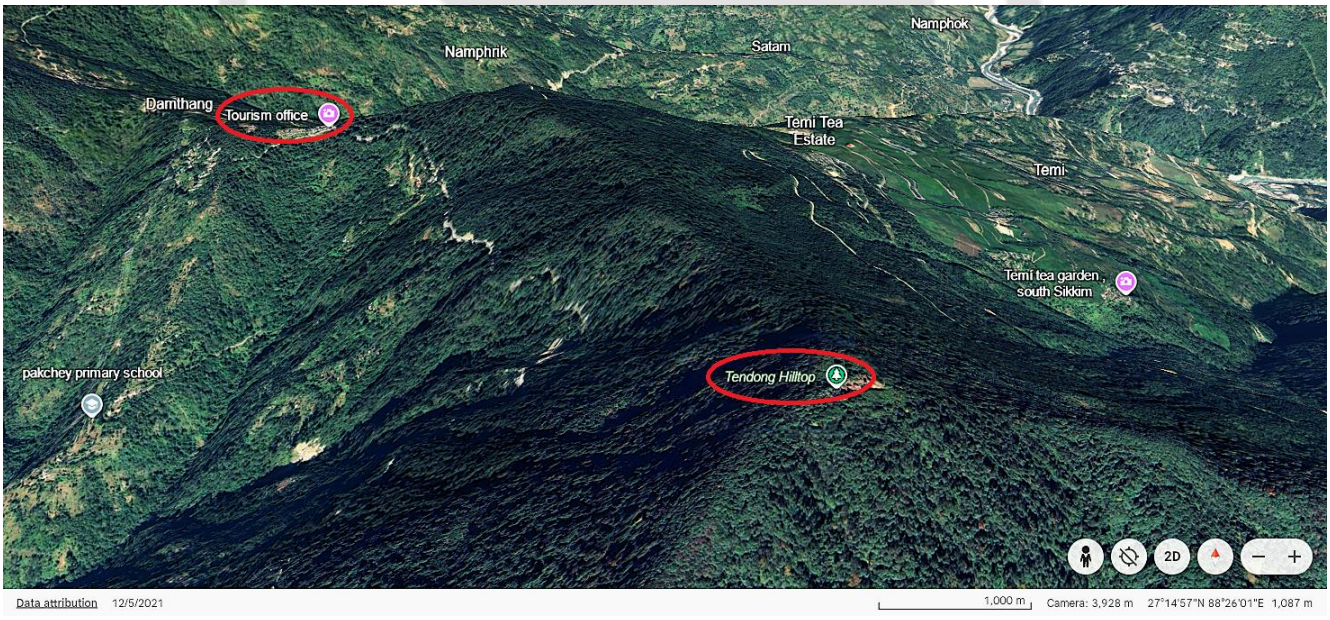


Map 2. Location of megalithic sites documented in this study

2.2. Examples of prominent Megalithic sites

2.2.a. Tendong Hill

The site of *Tendong Lho Rum Faat* is atop the Tendong Hill (GPS: 27°12'21"N, 88°24'28"E) in Damthang, South Sikkim District which finds mention in the legendary folktale concerning the Rivers Teesta and Rangeet (See Appendix 1). However, to contextualise the significance of the place Tendong, the word is believed to come from the Lepcha word *Tungrong* which means ladder or 'uplifted horn' (Tamsang, 2008, p. 20). According to a folktale, when floods caused destruction and submergence of settlements, the inhabitants and other living organisms sought refuge in the Tendong Hill. Therefore, *Tendong Lho Rum Faat* is celebrated as a way of showing gratitude to the Hill which is believed to have saved the living beings from drowning in the flood in deep time.



Map 3. Location of Tendong Hilltop (Google Earth n.d., Retrieved on 15.11.2024)

The ceremony of *Tendong Lho Rum Faat* is celebrated in the month of August every year primarily by the Lepchas of Sikkim-Darjeeling. On the auspicious day, the *Bongthing* initiates the rituals which consist of offering agricultural produce along with fruits, *chi*, butter lamps and incense sticks. *Chi* is sprinkled around during the ritual as a symbolic continuity of how it was sprinkled while invocating Itmuboo as described in the folktale.

The site of Tendong Hill consists of a number of stone structures and a Buddhist monastery spread across the area of 4213 square metres. To reach the site, one has to hike for 6 kilometers through thick bamboo groves starting from Damthang Tourism Office. Through the forest, the trail is paved with bricks to making it easy for the visitors to stay on track. The main altar where the ritual offerings are made consists of a *longchok* on top of a squarish stone which together is placed on a raised platform. The raised platform is a new structure with concrete and tiles. Surrounding the main *longchok* on four corners are smaller *longchoks* which are adorned with woodworm (*Titeypati*) plant and venerated as well. The square stone however has holes on four sides inside of which butter lamps are lit. There are smaller stones erected on the alter on two sides of the main *longchok*. These structures are protected by a railing on all sides which were adorned with numerous *khadas* (Tibetan silk scarfs) and a temporary roof made of a tarpaulin sheet to protect the monument as well as to make space for *Bongthing* and other visitors to sit. There is a gate which was locked during the time of the visit due to which measurements of the stones in the main altar could not be taken. The main altar was aligned to North - South direction with the altar situated to the north facing the South. Just behind the main altar Mt. Kanchenjunga can be seen on a clear day.

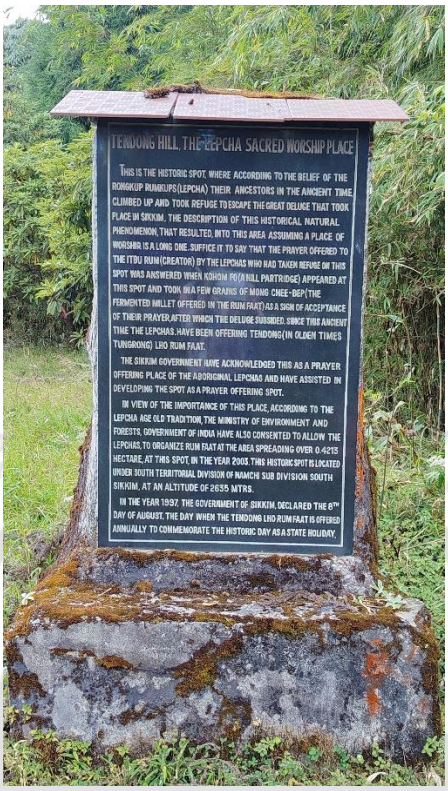


Figure1. Information plaque atop the Tendong Hill narrating the importance of *Tendong Lho Rum Faat* ceremony.

Figure 2. The main altar at Tendong Hill bounded by railing with colourful *khadas*

Figure 3. A close view of the longchok at the main altar

In the vicinity, there is a taller *longchok* encircled by round pile of stones as if to support the *longchok*. The *longchok* which was visible above the circular pile of stones measured 2.5 metres in length. The breadth of the stone at the base is 50 centimeters. The thickness of the *longchok* is 10 – 11 centimeters. A *khada* was tied to the longchok to mark its auspiciousness. On the circular base, there are offerings of flowers, incense sticks, rice and two small bamboo containers which probably contained *chi*. *Lapchaos* (a pile of stones) are delicately situated on the circular base. There are remnants of *Oroxylon indicum* flower commonly known as *Totola ko Phool* or *Koko Mendo* which are pasted on the stone structure. There are 12 such visible marks. The longchok lay on the East – West axis facing the East. Behind the longchok in a straight line there are two *chhortens* (stupa) made of stones.

The *chhorten* just behind the longchok is rectangular in shape situated on a rectangular base with most of the upper portion destroyed. It too was adorned with *Khadas* and *lapchaos.* The second *chhorten* is a dome shaped structure on a circular base and a pointed stone at the top. Opposite to the *Longchok* on the same East West axis, a little further away, a third *chhorten* is situated which has a square body on a circular base and a damaged upper portion. On the base of the *chhorten* there is a stone plaque which contains Buddhist prayers inscribed in Tibetan script. In the vicinity, there is a Buddhist *Gompa* commonly known as Tendong Gompa. The *Gompa* is closed throughout the year and is opened during the celebration of *Tendong Lho Rum Faat.*

Figure 4. Longchok encircled by round pile of stones

Figure 5. *Chhortens* behind a Longchok aligned in a straight line

Figure 6. A *chhorten* with a stone plaque

Figure 7. The stone plaque inscribed in Tibetan letters

Figure 8. Tendong Gompa atop Tendong Hill

Moreover, along the trail, there are *longchoks* erected, 'probably to indicate the path or to mark the sacredness of the place. The first *longchok* is a tapering stone encircled by a stones at the base. A *khada* is tied around a longchok as well as placed on the base. We can also note the presence of modern bricks kept along with the stones. The longchok (without the base) measures approximately 75 centimetres in length and is 8 centimetres thick. The breadth of the stone at the base is 58 centimetres whereas towards the top it measures 27 centimetres. The stones at the base appeared haphazard and seems to have been damaged over time. The base however measured approximately 105 centimetres making the entire structure 180 centimetres in length.

Figure 9. Longchoks along the way to Tendong Hill

The second *longchok* on the way side is associated with a small shrine placed on an altar. Longchok measured 105 centimetres in length, 45 centimetres in breadth at the base and 36.5 centimetres at the top. The thickness of the stone is 9-10 centimetres. Adjacent to the *longchok*, the stone altar is square in shape with 22 small *longchoks* erected on the top each of different shapes and sizes measuring 10-15 centimetres respectively. In the middle which usually houses the main longchok, there were dried leaves and bamboo sticks as if covering the main *longchok*. On one corner there was a wooden cylindrical shaft placed and venerated like a *longchok* measuring approximately 135 centimetres on which a *khada* was tied. It is not confirmed whether the wooden structure had a function of its own or served the purpose of a *longchok*. In that case, the categorization of certain wooden structures as megaliths based on their purpose and functions as discussed by Marak (2023:324) citing Yondri (2006) finds support in this instance.

Figure 10. An altar on the way to Tendong Hill

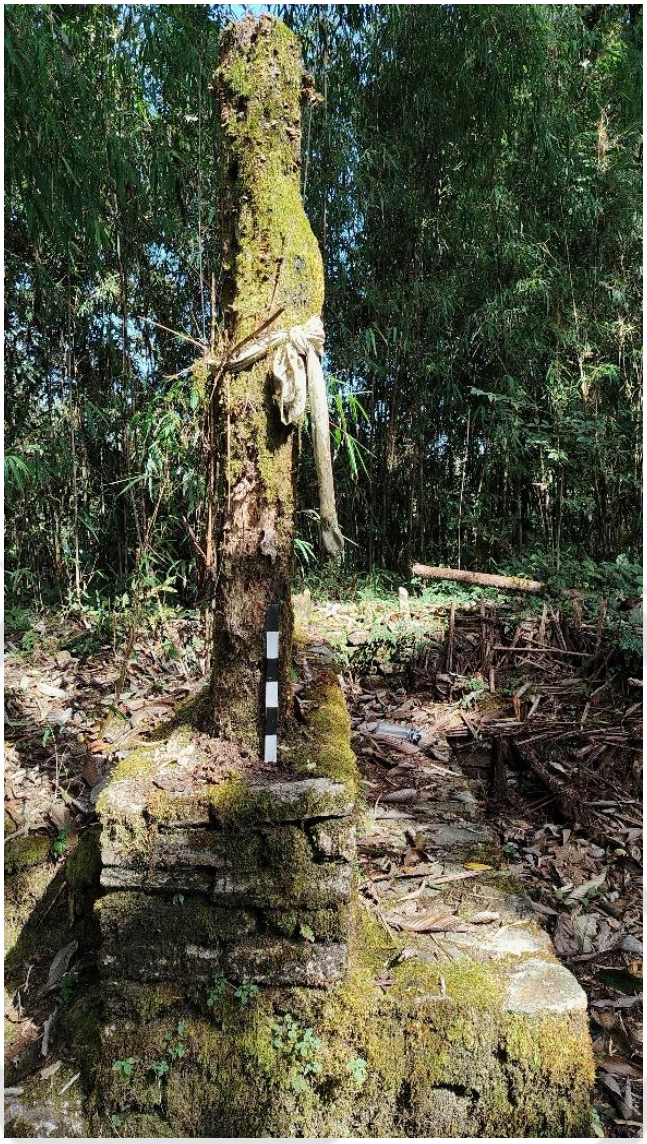


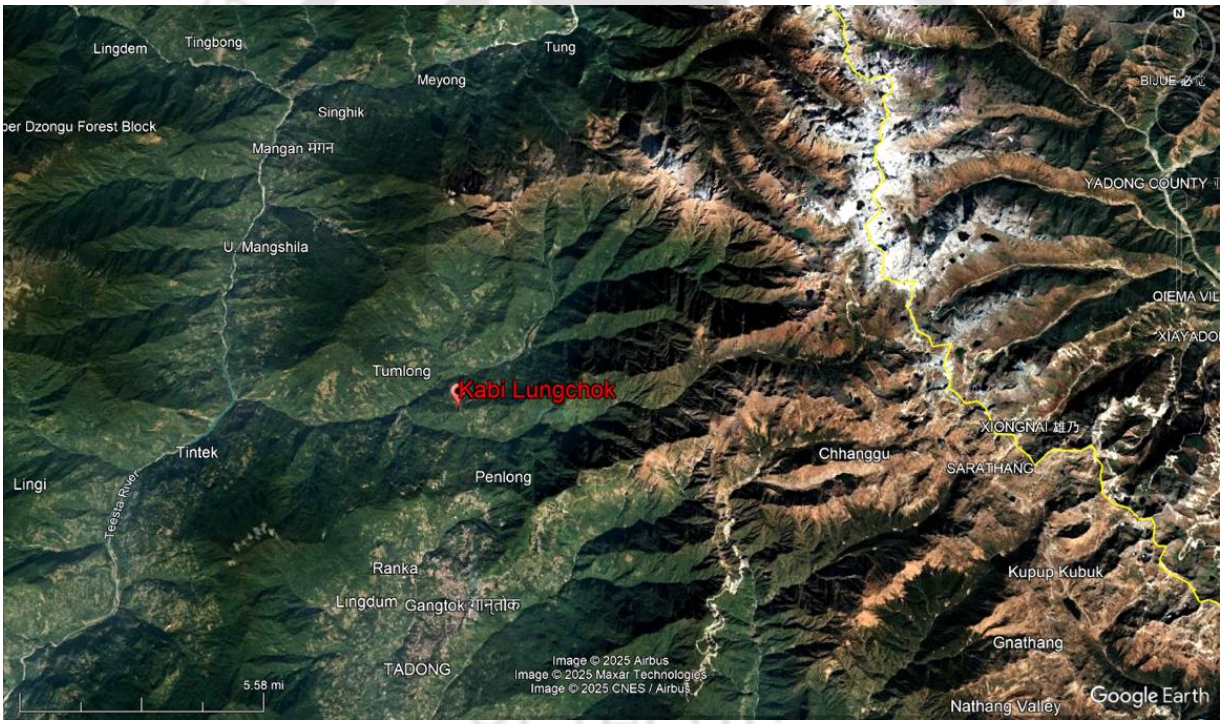
Figure 11. A wooden shaft venerated like a longchok

2.2.b. Kabi Lungchok

The evidence of Kabi Lungchok presents us with an example of erection of megaliths to commemorate events. The event here is the Blood Brotherhood Treaty which was symbolically signed between the Lepchas and the Tibetans in the 13th Century in a place called Kabi – about 20 kilometers from Gangtok, the capital of Sikkim. The signing of the treaty was led by Gyad Bumsa,

the Tibetan leader from Kham region, Tibet and Thikung Tek, a Lepcha chieftain and Shaman of present day Sikkim-Darjeeling.

At the entrance of the site, there is a bunch of stones erected in a circle on top of which are piles of small stones. They are adorned with *khada* which seemed old and worn out. In the vicinity, where the treaty is believed to have been signed, there are 9 stones haphazardly erected. These stones are also adorned with colourful *khadas*. Behind the stones, under a tree, there is a small shrine accompanied by a pile of stones.



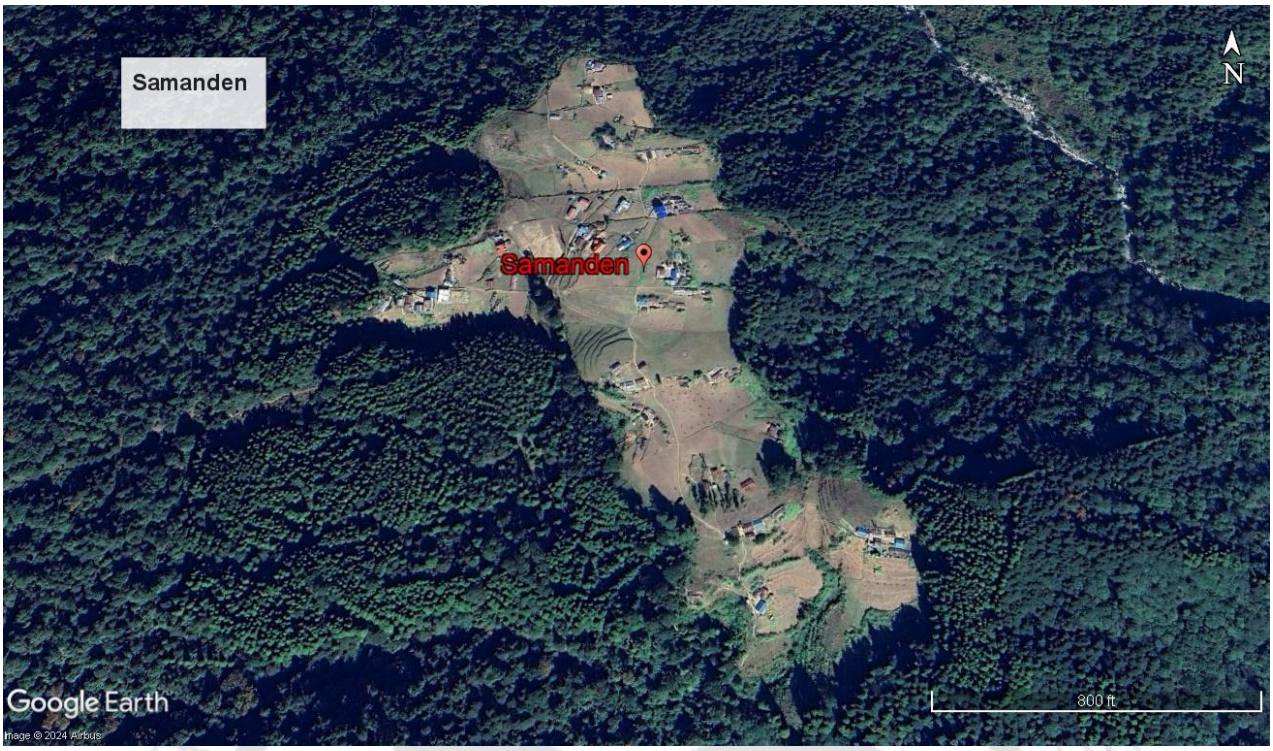
Map 4. The location of Kabi Lungchok (Google Earth n.d., Retrieved on 21.01.2025)

Figure 12. Stones erected at the entrance of Kabi Lungchok

Figure 13. The main spot of Kabi Lungchok

2.2.c. *Sokpa Dhunga* of Samanden

The evidence of *Sokpa Dhunga* comes from Samanden in the northernmost part of West Bengal. It is one of the last villages of West Bengal separated from Sikkim by River Rammam. The altitude of the place is 2361 meters above MSL, and the coordinates are 27°10' North and 88°4' East. The Sokpa Dhunga is located amidst pine trees (GPS coordinates: 27°10'39.924" N and 88°4'28.698" E) and adorned with *Khada*. Occasionally, some adoration is discernible from scattered coins, incense sticks and an image of Hindu Goddess Lakshmi and Lord Ganesh. It tapers towards the top but is not finely pointed. It has a flat top. The length of the stone is 50 cm, its breadth is 28 cm, and its width is 6 cm. The breadth of the flat top is 10 cm. There is a folktale attached to it which talks about Human-Yeti interaction in the hoary antiquity that led to the demarcation of their land into habitable and forest land. The popular belief is that the term *Samanden* comes from the word *Samalden. Samal* or *chamal*, in Nepali language, means rice. Another interpretation of the word Samanden is that it is derived from a Limbu word *Samangden* which translates to 'abode of the Deities. Agriculture is the people's mainstay in this place; potatoes, maize and peas are grown in different seasons. The place is a flat land surrounded by pine forests on all sides.



Map 5. Samanden – a flat land surrounded by pine forest on all sides. (Google Earth n.d., Retrieved on 21.01.2025

Figure 14. *Sokpa Dhunga* in Samanden

This folktale has been considered regarding locating a site where a legend or a belief substantiates evidence in the landscape. This gives us a glimpse of how the inhabitants' imagination of the cultural and material understanding of something they had not seen with their eyes or had no memory of must have come to be. As mentioned earlier, there are no Lepchas residing in the village, but people from different ethnic groups from the larger Nepali fold like Rai, Limbu, Tamang, Chettri/Chhetri, and Gurung, among others, who have no memory - collective or personal of how the stone came to be erected on that spot, makes it engaging in pondering upon the practice of erecting *Longchoks* by the Lepchas. The adoration of the stones using *Khadas*, along with the image of Goddess Lakshmi and Lord Ganesh of the Brahmanical pantheon, suggests that anything unsure and unestablished, which is not naturally occurring in the landscape, is assigned to the supernatural of the dominant faith and hence propitiated for fear of the unknown.

2.2.d. *Devithanas*

The mountain landscape of Sikkim-Darjeeling is marked by *Devithanas*. *Devithanas* are situated in the vicinity of a village and associated with either a water source known as *Dhara* or forested areas. These places are considered sacred by the local inhabitants and nurture myriad of beliefs about the local deities with regard to protection and safeguard of the village. An identifiable marker of a *Devithana* is that it is usually situated on a raised platform and adorned with colourful prayer flags and *Khadas* both of which belong to Buddhist cultural milieu.

A typical *Devithana* will have either one, three or seven stones vertically erected to symbolise different Gods and Goddesses of the Hindu Pantheon. These erected stones are known as *Thapana* which comes from the word *Sthapana* which means to establish or sanctify (Wisdom Library, 2024). The practice of worshipping *Devithana*s indicates an intimate nature-culture interaction “to

create idyllic village societies" which also symbolise an assertion of Nepali autochthony and belongingness in the region where Bhutias and Lepchas had a considerable dominance over the sacred landscape (Acharya & Ormsby, 2017, p. 234). Within the study region, *Devithanas* have been spotted in places like Samanden, whereas there are many such *Devithanas* across Sikkim and North Bengal.

The Samanden Devisthan is situated within a forested area, approximately 500 meters distant from the location of Sokpa Dhunga. The spot enshrines a brass idol of Goddess Durga, positioned on a raised concrete pedestal and adorned with bells and tridents. However, a 73 years old (As in June 2022) resident of Samanden presents a conflicting narrative. According to his recollection, the central object of veneration in the Devithana used to be a transparent, glass-like stone with sharp edges. This stone stood approximately 2 feet tall and 1.5 feet wide. Apart from the main Durga shrine, there a subsidiary shrines dedicated to Lord Shiva and Parvati and Ganesh along with local Gods and Goddesses known by the names *Sansarey Devta*, *Aitabarey* and *Jungli Devta* which too are represented by smaller stones erected in the vicinity. These stones measure approximately 1 feet in height as depicted in the photographs with the scale. However, being a sacred site, it was not permissible to measure or touch all aspects of the stone. Futhermore, previously animal sacrifices (especially hen) were done on special occasions in the Devithana, which at present has stopped and replaced with vegetables and fruits. However, there are rituals which celebrate Udhauli-Ubauli Pooja in the Devithana in the month of Mangsir (November-December) and Baisakh (April-May) respectively.

2.2.e. Mahakala Dara Temple

Mahakala Dara (GPS: 27º02'51" N, 88º16'04" E) stands at a strategic point and offers a commanding view of Darjeeling town and the majestic Kanchenjunga to the North. At present there is a cluster of Hindu temples dedicated to many Gods and Goddesses of the Hindu pantheon but principally to Lord Shiva which is why the hill came to be known as Mahakala Dara or a hill where a Shiva temple is situated. The term *Dara* in Nepali language means a hill. The crucial position of the hill lured the attention of the East India Company officials who used this site as an observatory point to watch over the landscape thus also referring to it as Observatory Hill.

The temple features a set of triliths and a monolith housed in the sanctum sanctorum of the present Mahakala Temple. Foning (2003, pp. 48-49) states that the erected stones on this hill was indeed a *lha thu*. Over time, these stones have been repurposed as the primary object of veneration inside the Mahakala Temple, which now serves as a place of worship for both Hindu and Buddhist practitioners. The trilith is commonly believed to embody Brahma, Vishnu, and Shiva, collectively representing the Hindu trinity. There is a monolith positioned behind, seemingly lending support to the tri-lith. The tri-lith is concealed and adorned with golden colored embellishment serving both ritualistic purposes and safeguarding its sanctity. Despite its prominence, the origins of the tri-lith remain shrouded in mystery, as locals ascribe its miraculous emergence in the spot itself. A short distance away, within the temple complex, lies a cave, where traditionally the triliths are said to have located, before their relocation to the present site (Bhanja, 2015, p. 25). Remarkably, the history predating the Buddhist Monastery's establishment in 1765 has faded into obscurity, forgotten by the locals over time.

Before being called Mahakala Dara, the hill was known by the name Dorje-Ling Gompa after a Buddhist Monastery was established by a lama named Dorje-Ling-Pa in the year 1765, as a branch of the Dorling Monastery of Sikkim (Nicholas and Rhodes, 2006, p. 74). The name Darjeeling is a derivation and an anglicized version of the name Dorje-Ling.

Map 6. Location of Mahakala Dara Temple, Daarjeeling (Google Earth n.d., Retrieved on 21.01.2025)

Figure 15. The samnctum sanctorum of Mahakala Dara temple, Darjeeling

D.T. Tamlong's (2015, p. 11) assertion regarding Darjeeling's original name as 'Darju Lyang,' signifying 'Darju' as God and 'Lyang' as a place, or the interpretation of 'Darjeeling' derived from 'Dorje-Ling,' which translates to 'invincible sacred stone,' adds intriguing dimensions to the region's historical nomenclature. Presently, a peaceful coexistence between Hindu and Buddhist cultures is observable, evidenced by Hindu priests and Buddhist Lamas sharing spaces for their respective religious observations. This coexistence might be rooted in the past; the initial monastery established by the Bhutias on the Observatory Hill, already regarded as sacred by the practicing Buddhists among the Lepchas, facilitated a harmonious sharing of this sanctified space.

The practice of keeping *sadaer long* or thunderstones in caves near the settlements to avoid their desecration was a regular phenomenon as noted by A.R Foning (2003, p. 33). These caves were selected in proximity to places where rituals like *Chyu Rum Fat* (Ritual for Mountain God) or *Lyang Rum Fat* (Ritual for the God of the Earth) were conducted. The cave in Mahakala Dara was one such sacred site where thunderstones or *sadaer longs* were deposited (Foning 2003, p. 33). Additionally, offering salutations to the deities found no superior point than the hilltop, providing a panoramic view of the Mountain and its surrounding terrain. According to Halfdan Siiger (1967, p. 194), Lepchas in Tingbung, Sikkim, conducted ceremonies and offerings involving the haphazard erection of one big stone and several smaller stones. The big stone symbolized Mt. Kanchenjunga, while the smaller rocks represented its lesser peaks.

2.2.f. The practice of *Udhauli Ubauli Pooja*

In tandem with the concept of stones erected for ritualistic purpose or as a boundary marker or for the purpose of showing the way to the travellers and hunters, the *Udhauli Ubauli Pooja* presents a distinct perspective. In contrast to the general understanding of megalithic structures as symbols of permanence in cultural landscapes, the erection of stones for *Udhauli –Ubauli Pooja* depicts smaller, ritual-specific stones that serve temporary functions. These smaller stones are eventually abandoned or removed after their purpose is fulfilled.

The term *Udhauli-Ubauli* is a Nepali term which comes from *Udho* meaning downwards and *Ubho* meaning upwards, typically signalling movement or navigation. Moreover, the term *Pooja* too has Sanskrit roots which means to worship. In this ritual, longish pointed stones are erected and worshipped twice a year but the spot or the stone is not permanent. According to a 68 year old (Age as in May 2022) respondent of Tikpur during winter months due to extreme cold temperature, people along with the cattle moved to the lowlands until the temperature became favourable for

them to migrate upwards again. The time or season for such a movement was determined by the movement of the fishes. If the fishes started moving upstream, the inhabitants would perform *Ubauli Pooja* and erect a stone in that place at the start of the journey as if to express gratitude to the place which gave them shelter for many months and to ask the forces of nature to guide them and be with them during their journey upwards to the highlands. The *Ubauli Pooja* was usually done in the month of *Baisakh* (sometime in April) and vice-versa with the *Udhauli Pooja* which is performed in the month of *Mangsir* (sometime in November), when the fishes start moving downstream.

Udhauli-Ubauli Pooja is primarily observed by the Kirata communities inhabiting the hilly regions of Eastern Nepal comprising mainly Rai and Limboo. The ritual is believed to have been performed to facilitate movement between altitudes - upwards towards the cooler highlands on *Baishakh poornima* (the full moon night in April-May) and downwards towards the warmer lowlands on *Mangsir poornima* (the full moon night in November-December) according to seasonal changes in weather conditions (Dahal 2021, pp. 14-15). The performance of a movement-oriented ritual, indicating a non-sedentary lifestyle of the Kiratas, has however, evolved into the ritual of thanksgiving for agricultural prosperity and veneration of the ancestors.

Map 7. Location of Tikpur where the remnants of Udhauli-Ubhauli Pooja were recorded (Google Earth n.d., Retrieved on 21.01.2025)

Figure 16. Stones erected for Udhauli-Ubhauli Pooja in Tikpur, Saikkim

In the present times, keeping the tradition alive, the *Udhauli-Ubauli Pooja* is done for prosperous agriculture and favourable weather to support it. It is a community tradition and is done on an auspicious day as decided by the *Bongthing*, who is a Lepcha Priest. The *Bongthing* initiates the rituals where a stone is erected and on four corners thin bamboo sticks are erected into which *Chi*, an intoxicating drink is poured to be worshipped. Previously animal sacrifices accompanied the ritual but presently, that is denounced and is replaced by offerings of vegetables and fruits. Another important component of *Udhauli-Ubauli* Pooja is the woodworm plant, locally known as *Titeypati* (*Artemisia vulgaris*). It is a herb locally available in abundance and known for its very high medicinal value. According to the inhabitants of Tikpur, any spot where a stone is erected and Titeypati is kept becomes a sacred spot for the Lepchas. In a village in Tikpur, just below the main road in an agricultural field (GPS: 27°7'52.74"N, 88°7'34.08" E), there were remnants of this ritual previously performed. There were seven stones kept in a straight line with boundary stones on either end. The stones are of similar dimensions – 24-28 centimeters in height, 16-24 cm in breadth and 12-16 cm in thickness.

Considering the fact that the Lepchas worship the God of forest: *Pong Rum*, and the God of Hunting- Dju Thing tells us that these ritualistic activities and the bounties of the forest were vital to the existence of the Lepchas. However, sedentism took a toll on their way of life where the rituals and the context of the rituals changed to an extent that the God who was earlier worshipped as the God of forest was now feared as a *mung* (devil). Nonetheless the living tradition of worshipping the environment around bi-annually seeking for protection still continues to the present times which gives us a speculative idea about the customs, traditions and their context as carried out in the past.

An important element in the *Udhauli Ubauli Pooja* practiced by the Kiratas of Eastern Nepal are the three hearth stones or *Chulha Dhunga* which is venerated (Dahal 2021, p. 21). At present, the practice of decorating an altar known as *Sakelathan* is observed which is usually at the foot of a tree, made of bamboo where fruits, vegetables and flowers are offered. In the past, animals were sacrificed which at present has been abandoned. Dahal (2021, p. 21) has noted that the *Ubhauli Pooja* which is observed in November-December is for good harvest whereas the *Udhauli Pooja* performed in April-May is for the worship of ancestors. Furthermore, the rituals are accompanied by dance and merriment known as *Sakelasilli.* Other important components of *Udhauli-Ubauli Pooja* include hazelnut leaves, ginger, alcohol and newly harvested rice[i].

In Tikpur, West Sikkim, the remnants of *Udhauli Ubauli Pooja* is performed by the Lepchas who had adopted Hinduism as their faith. In usual circumstances, particularly within the region of Sikkim – Darjeeling Himalaya we come across Lepchas practicing Buddhism or Christianity.

The Hindu Lepchas have therefore embraced the idea of performing *Udhauli Ubauli Pooja* like their Kirati co-inhabitants but have repurposed it with distinct Lepcha elements. This is exemplified by the Lepchas of Tikpur, who adopted the concept and terminology of *Udhauli-Ubauli Pooja* from the Kiratas alongside the incorporation of *chi* and woodworm plant (*Titeypati*) which are important elements of Lepcha rituals. Moreover, the stones that are erected count more than three in this case and are arranged in a straight line as opposed to the Kirati style where three stones are erected together to represent a hearth in a triangular manner.

With the shift towards a more sedentary lifestyle, there were changes in the cultural context of these rituals. The name '*Udhauli Ubauli'* which clearly suggests movement in a non-sedentary way of life, is presently observed as an agricultural ritual. This transformation reflects a shift that

is influenced by socio-cultural changes and changing environmental interactions. Since the ritual involving the erection of stones persists in contemporary times, it can be posited that its original function as a 'marker of movement' has largely been forgotten over time.

2.2.g. *Cherim* ceremony

The inhabitants of Dzongu in North Sikkim perform a ritual dedicated to Mount Kanchenjunga known as *Cherim or Chirim* which means "common ritual" (Bentley, 2011, p. 15). The ritual is done as an appeasement to the *Mungs* (evil spirits) and as a preventive measure to ward off illnesses during Monsoons when humans are most susceptible to contracting them (Bentley, 2011, p. 15). The ritual takes place at the onset of spring-summer season in an open shrine known as *lha-tu* which contains undressed stones haphazardly kept to replicate Kanchenjunga and the subsidiary peaks (Siiger, 1956, p. 42). Bentley (2011) however notes that there are two altars during the observance of *cherim* ritual. One that is made of bamboo sticks or wood which faces the Kanchenjunga and the second altar where stones – *longchoks* (which she spells as *langchok*) are erected facing the plains. The stones erected in the *lha tu* in Tinvong are described by Halfdan Siiger (1956, p. 42-43) as:

> It is composed of two groups of large, unfashioned stones, each group having a bigger stone as centre. One centre stone represents the god *kong chen,* the other stone his wife, while some smaller stones surrounding them are minor peaks, representing their soldiers or followers. Thus the shrine is a rough imitation of the mountain panorama and is, so to speak, an artificial replica of the divine and spiritual environments.

Therefore, the importance of *longchoks* in this case is not just religious but also entwined with social issues pertaining to health, well being and warding off illness. These are also places of social gathering where members of a community meet once or twice a year to celebrate festivals and perform rituals.

2.2.h. *Longchoks* of Longchok and Lungyam

6 kilometers from Daramdin Bazar, there is a village named Longchok. Respondent 6 recollected the existence of *longchoks* in Longchok village thus:

Respondent 6: त्यहाँ लोंग्चोकमा त थियो नि उइले नै, चौडाईमा २ फीट सम्मको, र त्यो भन्दा अग्लो-अग्लो यो २-3 वटा तर अहिले भने छैन। खै बाटो हरु बनाउदा भत्कायो कि, मान्छे हरु ले नजानेर।

(There in Longchok Village there were 2-3 of them, long time ago which were 2 feet in width and much taller than that in height but now a days they are not there. I wonder if they destroyed them while building the road)

Researcher: बजे, यता वारी परि चाहिँ छैन ?

(Grandfather, aren't there any around here?)

Respondent 6: अहँ दरम्दीन मा त छैन

(No there are no (longchoks) in Daramdin)

Map 8. Location of Longchok village and Lungyam. (Google Earth n.d., Retrieved on 21.01.2025)

The identical name shared by the village and a human made structure is noteworthy in indicating the existence of *longchoks* in the village at one point of time, thereby leading to the designation of the settlement based on this prominent landscape feature. As the respondent further suggests that *longchoks* were used to mark boundaries when the Lepchas practiced slash and burn cultivation. They were also erected as effective markers of ways through the forest or across the river as a sign for the posterity as well for ritualistic purposes. Furthermore, the respondant also mentioned that when people ventured out for hunting, gathering and fishing, *longchoks* were erected as a mark of thanksgiving to the nature which provided them with the bounties as well as to mark their trail. Moreover, it is worth noting that Longchok village is not the only one bearing this name. Villages with the name Longchok is found in other parts of Sikkim as well.

Another evidence of the existence of longchoks in the past comes from Lungyam village, situated on the banks of River Rammam, about approximately 3 kilometers from Longchok village. The

term *Lung* in Lepcha and Limboo language denotes stones. The residents mentioned that earlier there used to be ‘tall stones’ in a spot known as Kattarbotey. The term ‘Kattarbotey’ means a place of jackfruit trees. The stones do not exist in the spot now since they were destroyed by the flash flood and landslide in the year 1968 which is also believed to have changed the course of River Rammam[ii]. Rammam River also serves as the natural boundary between the state of West Bengal and Sikkim. The stones as he described were about 4 feet in height and 2 feet in breadth. The GPS co-ordinates of the places where it existed previously are 27º07'02.44" North and 88º09'51.57" East.

Figure 17. The spot where a *longchok* existed earlier in Lungyam, Sikkim

2.3 Conclusion

This chapter has provided an overview of the various examples of megaliths scattered across Sikkim-Darjeeling Himalayas and its current state of affairs. It also gives an account of the associated practices, beliefs and rituals which are conducted at present. Over time, their roles and functions have evolved and in some cases forgotten, adapting to socio-cultural changes, but the essence of these practices have endured in one form or another.

The examples of megaliths mentioned in the chapter, hold significant cultural and liturgical value. Their role as markers in the landscape, boundaries and as sacred spaces will be dealt in detail in the chapters to follow. These megaliths are further supported by legends and folktales, which highlight their continuous and lasting importance in shaping present day practices and beliefs. Additionally, it also highlights the importance of memory in cases where material evidence ceases to exist or is destroyed over time.

CHAPTER 3

Pottery

3.1. Introduction

Kok vim yang ta and *chyek ta* are two Lepcha phrases that most people in Sikkim-Darjeeling region are familiar with. These phrases are uttered in connection to a folktale which talks about a time when Lepchas made pots to go up to Heaven. Although the veracity of a folktale is difficult to advocate, people along with narrating the folktale also acknowledge to have seen pottery sherds in the region. The study and analysis of the pottery sherds have evaded academic discussions thus far. This chapter, therefore, gives a detailed trajectory of how the only spot in an area where pottery is visible today was explored and documented.

The quest for pottery sherds started with the colonial accounts which mention their presence in a place called Daramdin. Corroborating the prior information and those provided by the local inhabitants of the place, the following sections will elaborate on the methods and materials adopted in studying the pottery sherds of Sikkim.

3.2. Previous literature on the pottery sherds

Regarding the presence of pottery sherds in Daramdin, the first mention was made by H.H Risley in The Gazetteer of Sikkim (2020/1928) and C. De Beauvoir Stocks in Folklore and Customs of the Lap-chas of Sikkim (2001/1925). Moreover, K.P Tamsang (1983) mentions the abundance of fragments of earthen pottery in Daramdin and the neighbouring regions. Giuseppe Tucci (Tucci, 1973, pp. 58-59) has quoted René von Nebesky-Wojkowitz to describe the pottery sherds that the latter had seen ex-situ. However, Tucci acknowledges that neither Nebesky-Wojkowitz nor he had found any ceramics in the region (Tucci, 1973, p. 58). Nonetheless, the ceramics are described as small sherds with smooth and round edges. The clay had been mixed with mica and showed a

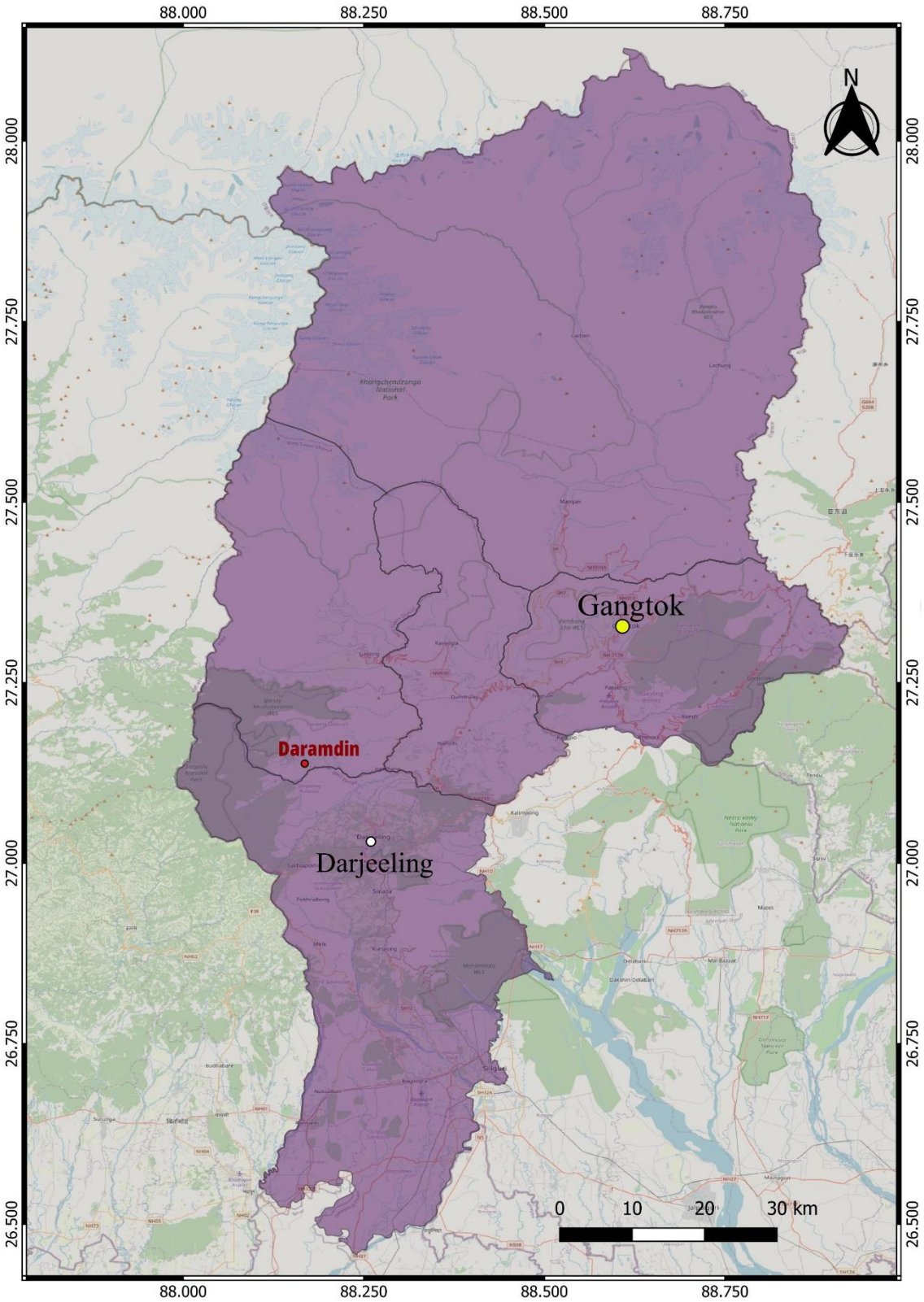
considerable variation in colours ranging from reddish-brown to blackish grey “according to firing” (Tucci, 1973, p. 59) The shapes of the vessels varied too where some were thin-walled, others were several centimeters thick which included bowls with everted rims and jars, which lacked any form of decoration, some sherds had three dark horizontal stripes around the vessel, and one fragment bore an incision mark that looked like dogtooth pattern (Tucci, 1973, 59).

3.3. Daramdin: Location and Etymology

The hamlet of Daramdin is famous for this celebrated Lepcha folktale. It is located in the district of Soreng, approximately 120 kilometres west of Gangtok - the capital city of Sikkim. The name Daramdin has varied interpretations. The Lepchas believe the word is made up of '*Da*', which means a lake, *Raom*, and *Dyen* means to demolish (Tamsang, 2008, p. 14). Nevertheless, other interpretations ascribe Tal-Laom Purtam as the original name of Daramdin (Tamsang, 1983, p. 5). Moreover, a village named Dhallam, which in all probability is a corrupted form of *Tal-Laom*, still exists in Daramdin. True to its name, '*Tal-Laom Purtam'*, the village rests on a flat land surrounded by hills on three sides and bounded in the South by River Rammam and South-east by a tributary of Rammam called Ringyang. River Rammam forms a natural boundary between present-day Sikkim and West Bengal. The place is well suited for agriculture, and most of the land is terraced for cultivation throughout the year. The Limboos[iii] called a certain place *'Fugamten'*, which is now known as Chyandara. The general belief among the Limboos is that the word *Daramdin* is an altered version of the term *Fugamten*. The etymology of *Fugamten* comprises *Fu*, which means pottery; *gam* which means to manufacture and *ten*, which means a place. Hence, the term *Fugamten* translates to 'a place where pottery is manufactured'[iv]. The Nepali term Chyandaara comprises *chyan*, which means graves and *dara*, a hill. Therefore, Chyandaara means a graveyard

on a hill containing numerous old and new graves. A notable fact would be the Limboo and Lepcha connotation of the place concerning the manufacture and use of pottery in the same spot.

Additionaly, new light was thrown by a resident of the place where he mentioned that the word *Dallam* in Lepcha language meant a flat land where people rested. According to him, due to various kinds of diseases in warmer places towards the south, chief among which were *kalo joro* (black fever) or *aule joro* (fever from the lowlands) or malaria, the Lepchas started moving upwards towards cooler climes. They would clear forests and rest there before moving further to other locations. This place was one such resting place where a vast expanse of flat land was cleared and made available for habitation thus earning the name *Dallam.*



Map 9. Map showing the location of Daramdin

Figure 18. The flat land of Daramdin, Sikkim

Figure 19. River Rammam demarcating Sikkim and West Bengal

3.4. Quest for Pottery Sherds

Following the folktale and a preliminary desk study on the legend of *Rumlyang Tungrong*, a field study was undertaken at Daramdin. On arrival to Daramdin, since the place was new to the researcher and vive-versa, 4-5 days was spent on talking to people, building rapport and making the residents known about the purpose of the researcher's stay in the village in the upcoming months. This was important for a fact that the residents were fully aware of the intention of the researcher for asking questions and conducting interviews. In the days to come, the residents also offered all possible help with the logistics as well as with the snowball sampling.

The interview commenced and the respondents selected were firstly elderly residents of the village of Daramdin since it was assumed by the researcher that they would best be able to talk about the beliefs, practices, folktales and the material evidences in question. However, there were divergent viewpoints regarding this. Some respondents replied that the pottery sherds were still found in the region though very less now, and some respondents were of the opinion that they cease to be visible at present.

The first respondent was an old gentleman strolling around in the front yard of his home. When the researcher approached him, he kindly replied:

Respondent 1: ए! हाढ़िको चोइटाहरु खोज्दै आउनु भाको?

(Oh! Have you come looking for broken pottery sherds?)

Researcher: हजुर!

(Yes!)

Respondent 1: अँ! पाउँछ, पाउँछ, यहाँ वरी परि पाउँछ, तर जमिन मुनि दबिएको हुन्छ, निकाल्नु पर्छ

(Yes! You will find, you will find, you will find them all around here, but it will be buried under the surface, it has to be taken out)

However, the second respondent working in his field, where maize was freshly sown, about 30-40 meters from the first respondent's house, when asked if he has seen broken pottery sherds while ploughing the field responded thus:

Respondent 2: ऊँ तल च्यानडांडा मा चाँही देखेको, अरु जगा त कहीं पाउँदैन

(I have seen them down there in Chyaaandara (but) they cannot be found anywhere else)

Researcher: माथी तिर, तल तिर कत्तै पाइन्दैन ?

(Can't we find them in places down there or up there) (pointing to the surrounding fields and places)

Respondent 2: अहँ! त्यहि च्यान डाँडामा मात्र हो देखेको

(No! Its only in Chyaandara that they are seen)

There is yet another narrative about the potsherds and the folktale. There were 5-6 farmers working in the field harvesting potatoes which were sown along with maize. This field was situated about 1.5 kilometer from the location of the above respondents. They were of the opinion that the event of *Rumlyang Tungrong* had taken place in and around this field. Contrary to this opinion, others in Daramdin believed that the event had actually taken place in and around Chyaandara since the pottery sherds were visible in Chyaandara. However, regarding the abundance and visibility of the potsherds, the respondents' response was thus:

Respondent(s) 3: उइले उइले त पूरा पाउँथ्यो अरे भनेको सुनेको, आइले त छैन,भेटाँइन्दैन

(I used to hear that long ago there would be abundant of them, but nowadays they are not found)

Researcher: ए ... तपाइले देख्नु भाको?

(Oh… Have you seen them?)

Respondent(s) 3: हजुर, यहाँ खेततिर लटरम्मै पाउँथ्यो अरे , खै, अहिले त छैन.

(Yes, apparently there were abundant of them in the fields, but there aren't any now)

Therefore, the inhabitants of the place are unanimous in telling that in the "days of yore" the surface of the region was abundantly strewn with pottery sherds which has ceased to be visible at present. Regarding this, another respondent had an interesting logic where she mentioned that most of the fields nowadays are ploughed with the help of tractors so no one probably notices the small pieces of pottery.

Respondent 4: अहिले त प्राय जस्तो खेत हरु tractor ले जोत्व अन्त त्यो सानु सानु टुक्रा के देख्ला र! गोरुले जोत्ने खेतमा जानु नि, कतै पाइन्थ्यो कि!

(Nowadays most of the fields are tilled by a tractor so the small pieces cannot be seen. Go to the field which are still tilled with the help of oxen you might get some!)

The respondents who has previously seen the potsherds in their field were asked about the formal description of the pottery. Their reply was that they were principally of two colours – reddish and black and the thickness ranged from 0.5 – 1 inch.

Figure 20. Pottery sherds scattered on the surface of Chyandaara, Daramdin

Apart from the elderly persons (persons above 60 years of age), respondents of different age groups were approached with the similar kind of questions and true to the assumptions; children up till the age of 16 were quite unaware of the remnants of pottery sherds in the region though they had heard of the folktale. The respondents between the age of 20-40 knew about the folktale and had heard stories about the presence of potsherds in the region but could hardly recount anything other than that. The elderly respondents were thus able to talk about the folktale, its details and variation, the spot where the potsherds were visible previously. Apart from the age factor, the respondents also belonged to various occupations. Though most of them were farmers, those who were interviewed were also teachers, daily wage labourers, contractors, businessmen/women and those in various government services. Out of these occupations, the farmers, daily wage labourers working on construction sites and contractors who

were directly associated with 'land' in the form of ploughing, digging and moving about the region for different works had valuable information to divulge regarding the pots, potsherds and bones found in the vicinity. However, few female respondents replied along the lines of *"I came to this place only after marriage so I do not know about it. Maybe you can ask my husband"*.

In this regard, an interview with one of the respondents yielded important information regarding urn burial of babies in the past and one such urn found in the terraces of Chyaandara.

Respondent 5: मैले त देखेको होइन तर उइले कुरा गरेको सुनेको नि … हाँडी भित्र हालेर नानी हरु गाढ़थ्यो अरे च्यान्दारा मा भनेको

(I have not seen it with my eyes but long ago I heard that small babies were put in urns and buried in Chyaandara)

This narrative was substantiated by a resident near Chyaandara who mentioned that *many* years ago there was an intact urn found from one of the terraces of Chyaandara with bones inside while tilling the place for cultivation. Fearing that it might be evil or an act of sorcery, the residents collectively decided to throw it away. Similarly, as was narrated, about 20 years ago, when the foundation for a Temple, known as Sri Sathya Sai Sarva Dharma Kendra, Daramdin was being laid, an intact pot along with small broken pottery pieces was recovered from the site. However, there was nothing inside this urn.

In a place called Mathilo Tar within Daramdin vallage, the Government of Sikkim has proposed to build a replica of the Stairway to heaven and a Lepcha Museum. The project started in 1993 and is still underway. A respondent who had closely monitored the project in the initial years when the soil was being excavated to lay the foundation of the edifice commemorates thus:

Respondent 6: हजुर पाउँथ्यो , निकै चै हैन, अलि अलि चाँहि पाउँथ्यो

(Yes we used to get. Not a lot of them but some)

Researcher: कतिको गहिरोमा भेटाउनु हुन्थ्यो?

(At what depth did you usually find?)

Respondent 6: खन्नु चाहिँ 60-70 फीट सम्म खनेको, खै त्याति भित्र पाएको, ठ्याक्कै चाहिँ बताउनु सक्दिन 26-25 । वर्ष अघिको कुरा हो

(We dug about 60-70 feet, it was found within that depth (but) I cannot remember the precise depth. It was dug 25-26 years ago)

Researcher: माथि तिर नै पाउनु भएको कि, बीच तिर कि अलिक मुनि तिर ?

(Did you find them towards the top or in the middle or towards the bottom?)

Respondent 6: साह्रै मुनि तिर त होइन, बीच तिर, माथि तिर नै हुन्थ्यो.

(They wouldn't be at the bottom, most of them were towards the middle and top)

It is noteworthy to highlight that the respondent also mentioned about *something* that looked like a stone hearth associated with charcoal pieces in the middle portions of the foundation pit.

In connection to this, a contractor working in Lungyam village which is approximately 6 kilometers from Daramdin Bazar in a spot near Kattarbotey mentioned that in one of his road building projects when he was excavating the place, potsherds and charcoal were found in the past. They were also found in the nearby agricultural field where at the time of field visit (May, 2022) maize was being cultivated. Kattarbotey is a flat land on the banks of Rammam River where most of the land is engaged in agriculture. As regards the pottery sherds that were found there, they were thick and as he describes the thickness of the potsherds he mentioned that they were "more than 0.5 inch and less than 1 inch". The colours of the potsherds were red and black. A legend about

Lungyam village is that when the Stairway to Heaven (the one in the folktale) crumbled to the ground, some parts of the stairway fell on this place, hence the presence of potsherds.

A Respondent (Age 56 years in June 2022) from Tikpur had a similar narrative of the time of his grandfather and father finding pottery sherds in the agricultural fields while ploughing the field, along with beads which were red in colour. In addition to that he mentions that it has been more than 30-35 years he has not heard of pottery sherds in the region. He describes the pottery sherds as stone like textured and layered. The thickness would be about 1 inch and the colour of the sherds would be black or grey.

The respondent also talked about beads that were found along with the pottery sherds. They were of two kinds – one would be the size of a pea and the other kind would be bigger than that with a perforation. They would be shining red in colour and round in shape.

3.5. Findings

Corroborating the folktale, the records of the scholars and the memory of the inhabitants of the place, a survey on foot was undertaken in Daramdin. Daramdin being an agricultural village, very little land is left fallow. Year round there is cultivation of different crops like paddy, potatoes, maize and buckwheat among others. This posed a major challenge for the researcher to access private fields and the visibility too was marred by the cultivation of crops.

Nonetheless, in an agricultural terrace on a spot colloquially called Chyaandara (GPS co-ordinates: 27º8'4.69" N and 88º10'24.68" E), a kilometer ahead of Daramdin Bazaar, there were remnants of pottery sherds on the surface on those terraces which were left fallow for that season (March 2021) when rest of the terraces were filled with Buckwheat cultivation. This enabled the survey to be conducted with ease. The field is divided into eleven terraces. An unsystematic sampling of the potsherds was done. The spots from where the sherds were collected were chosen on the basis of the

visibility of the potsherds on the surface. Out of the total 116 potsherds collected 5 are rim sherds and the rest are body sherds. The thickness of pottery sherds vary from 3.6 mm to 14.8 mm. Depending on the thickness, the potsherds have been divided into three categories, namely:

- **Group 1 -** thickness range from 3.6mm to 7 mm
- **Group 2 -** thickness range from 7.1 mm – 10 mm
- **Group 3 -** thickness range from 10.1 mm – 14.8 mm

In each of the categories, the thickness varies considerably as shown in the table below.

Category	Thickness (mm)	No. of Potsherds	Percentage (%)
Group 1	3.6 - 7	54	46.55
Group 2	7.1 - 10	42	36.20
Group 3	10.1 – 14.8	20	17.24
Total	-	116	99.99

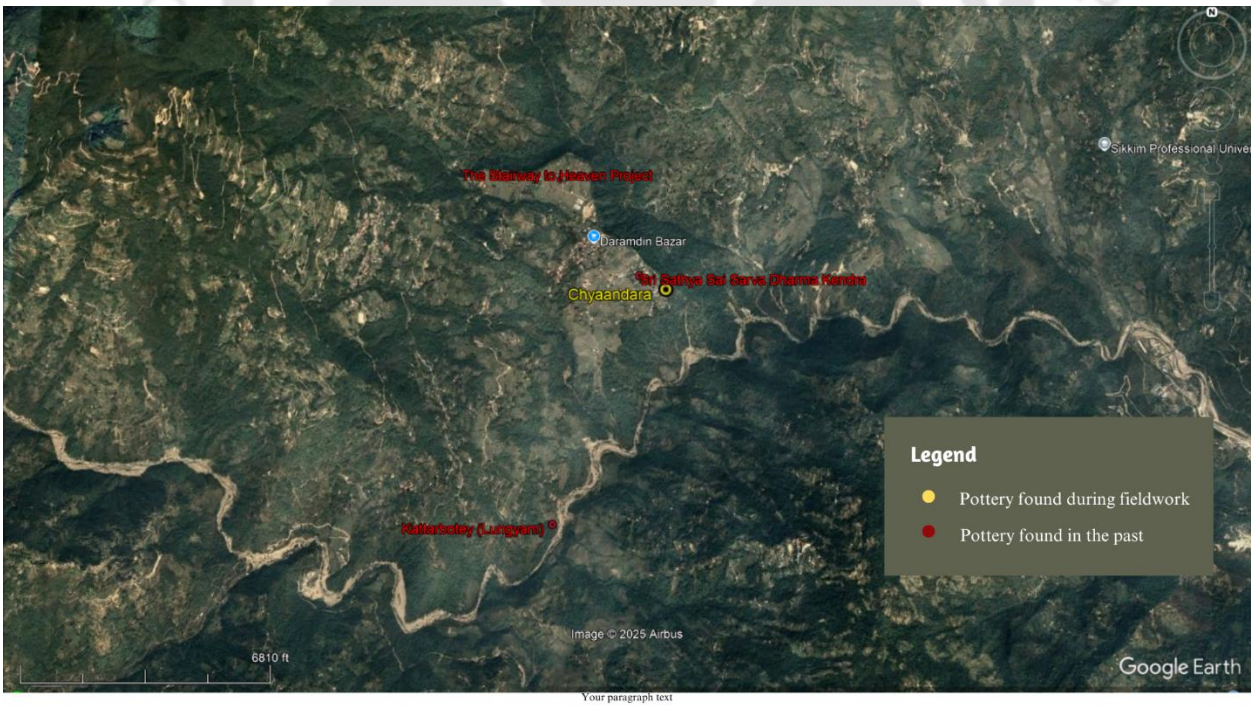
Table 1. The thickness of the pottery sherds from Chyandaara

Following the recording and collection of potsherds from this spot, and insights gathered from interviews with local residents, exploratory investigations were conducted in places in and around the village of Daramdin. The field work area chosen for survey was determined by the name of the places mentioned in the folktales as well as natural boundaries of the region. The northern, western and southern boundary were determined by Rammam River whereas the eastern boundary was determined by the Ringyang River, a tributary of Rammam River. Despite facing challenges such as crop cultivation, dense vegetation, and populated areas, our investigations persisted where sites of pottery

discoveries as identified and narrated by the residents were recorded using GPS co-ordinates and mapped. This methodology allows for a systematic mapping of the geographic distribution of pottery sherds which were previously spotted and those which at present are exposed to the surface, providing a broader understanding of the potential archaeological context in the region. Besides Chyandara, the other precise spots like agricultural fields and road construction sites as identified through narrations and anecdotal evidence by the residents are tabulated below (**Table 2**).

Sl. No.	Location	GPS co-ordinates
1.	Stairway to Heaven Project	27º08'38.21" N , 88º09'51.15" E
2.	Sri Sathya Sai Sarva Dharma Kendra	27º08'10.97" N, 88º10'16.30" E
3.	Kattarbotey (Lungyam)	27º07'02.17" N, 88º09'49.86" E

Table 2. The three locations where pottery has been sighted in the past



Map 10. Map showing locations where pottery sherds were found (Google Earth n.d., Retrieved on 08.04.2024)

It is noteworthy that apart from Daramdin, and Lungyam, the residents of other places surveyed like Longchok, Siktam, Tikpur, Okhrey, Ribdi, Bhareng, Sombarey, Gorkhey and Samanden had not seen pottery around in the vicinity. They were however aware of the presence of pottery sherds in Daramdin.

Therefore, in order to investigate deeper into the pottery sherds found in Daramdin, two test pits were dug in a suitable spot beside Chyandara. The test pits were approximately 85 metres apart from each other.

Test pit **A** (GPS co-ordinates: 27º8'4.53" N, 88º10'25.07" E) at an altitude of 929 MSL situated on one of the terraces of an agricultural field consists of 2 layers. The area of Test pit is 2 x 2 meters. The depth of the pit is 92 cm from the surface. The layers are distinct from one another. Below the humus layer, there is only one other layer. The colour of the soil is determined using Munsell Soil Colour Book. The details are as follows:

Sl. No.	Layer	Colour	Name of the colour
1.	1	10YR 2/2	Very Dark Brown
2.	2	10YR 3/3	Dark Brown

Table 3. Table showing colour of the soil from Test Pit A

9 potsherds are collected from the pit. Most of the potsherds are noted between 20 cm- 40 cm from the surface. From 68 cm onwards, there were no potsherds. Charcoal is collected from three depths – 30cm, 42 cm and 78 cm from the surface.

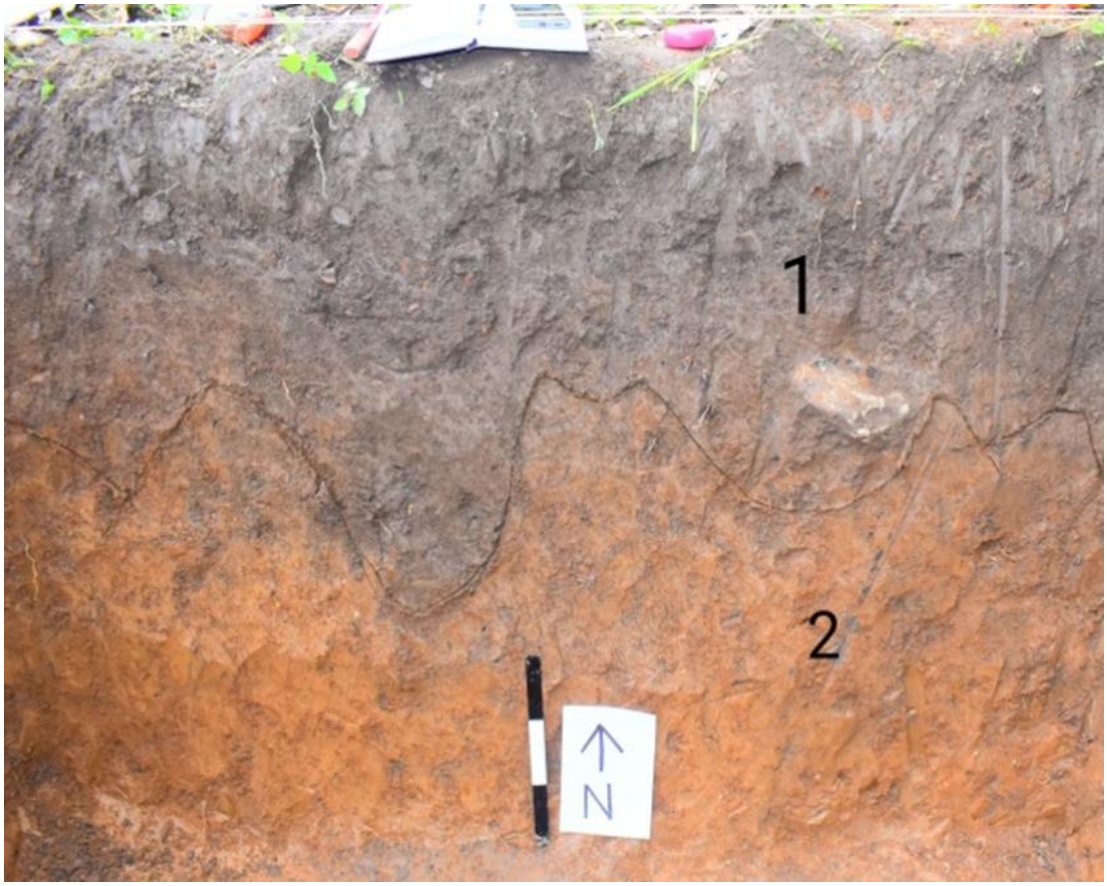


Figure 21. Section of Test pit A

Figure 22. Samples of pottery sherds collected from Test pit A

Test Pit **B** (GPS co-ordinates: 27º8'5.54"N, 88º10'24.93"E), located at 942 MSL, comprises 4 layers (including the humus layer). The area of the pit is 1 x 1 meters and the depth is 100 cm from the surface. There are 35 potsherds collected in total which were collected from 15 cm downwards up to 80 cm depth. There are distinctly 2 types – black potsherds and red potsherds. The colour of the potsherds were determined using the Munsell Soil Colour Chart. Black potsherds (2.5 Y 2.5/1, Black) are found at a depth range of 20-40 cm from the surface. Dark Reddish Brown pottery (5 YR 3/3 and 5 YR ¾, dark reddish brown) was also found from the same range. The pottery collected from the depth range of 60-80 cm corresponded to 7.5 YR 6/6, Reddish yellow. Charcoal was found at a depth of 97 cm and 100 cm. The colour of the soil in different stratigraphic layers too was determined using Munsell Soil colour Book and the details are as follows:

Sl. No.	Layer	Colour	Name of the Colour
1.	1	10YR 2/2	Very Dark Brown
2.	2	7.5 YR 2.5/1	Black
3.	3	10 YR 4/3	Brown
4.	4	7.5 YR ¾	Dark Brown

Table 4. Table showing colour of the soil from Test pit 'B'

Figure 23. Section of Test pit B

Figure 24. Samples of pottery sherds collected from Test pit B

At present the region does not have the tradition of manufacturing pottery. However, there are memories of Potters (*Kumale*) coming from Nepal. A respondent of 92 years old (as of May 2022) recalled seeing the last of the potters and pottery making in his teenage years i.e., when he was 15-16 years old. If rough estimates are to be made about the year, it would come to around 1945-46. However, most of the elderly persons in Daramdin could relay the memories which their fathers and grandfathers had told them about the potters despite not having seen any of it themselves. They were seasonal potters who came to Daramdin for 3-4 dry months of the year – *Mangsir* (mid November-mid December), *Push* (mid December- mid January), *Magh* (mid January –mid February) and *Fagun* (mid Februaru to mid March) . By the end of *Fagun*, they would prepare to leave. The *Kumales* came with their required tool kit to manufacture pottery. They would be a group of 5-6 men and there was division of labour. Some men would knead the soil and some would mould the clay while some would dry and fire them. In addition to the potters, there would be traders from Nepal who came in this place to sell *Nanglo* (tray made by weaving cane), *Mandro* (cane carpet) and *Thunche* or *Doko* (conical shaped basket made of cane) among other things. In return, they would take salt with them to Nepal.

The respondents are unsure as to where the clay was brought from, one of them mentioned that it *might be* from somewhere around here where another respondent acknowledged that he was too small to remember that. Since most of the current respondents hadn't seen the Kumales, they were unable to say where the clay was collected from. Nonetheless, other respondents who had seen the process of the manufacture of pots remembered that most of the pots resembled the shape of *ghyampa* – a container which is used to produce and keep *raksi*- fermented rice beer or *gagri* – a container with constricted neck and everted rims generally used to store water . The shape of the pots would be bulbous with rounded base which needed support to stand straight. For the support, a round base was made of dried

hay known as *paral*. The pots were made on a wheel. As remembered and demonstrated by the respondent the potters wheel would be approximately 3-3.5 feet in diameter.

Once the pots of different shapes and sizes were made, a hole was dug in the ground and the pots were loosely kept one on top of another. It was covered with dry hay (*paral*) and fired. The respondent doesn't remember any post firing processes but mentioned that some pots were decorated with groove like marks or fine lines. Some of these pots also had lids to cover. They were used for keeping clothes inside them. This account finds congruence to another account of a respondent where he recalls that the pottery sherds which looked like plates were also unearthed in the past. The pots were then sold in nearby market places like Jorethang in South Sikkim, Bijanbari in West Bengal, and Sombaria in West Sikkim to name a few, on days of weekly markets called *Haat*.

3.6. Summary and conclusion

Therefore, the memory of the respondents in connection to the context, processes and general understanding of the pots and potters' way of life in Daramdin have proven to be of value for locating and identifying spots and places where potsherds or charcoal were previously found. This gives us ideas about the spatial understanding of the findspots as well as provide indications for the survey at present and future.

Chapter 4

Analysis of Megaliths

4.1. Introduction

The hypothesis formulated in the introductory chapter has been substantiated with evidences in the following two chapters after the introduction. This chapter therefore, discusses the megaliths of Sikkim-Darjeeling Himalayas against the wider continuum of megalithic cultures of the neighbouring regions. North East India is replete with evidence of megalithic structures exhibiting what has been termed as 'living megalithism' (Marak and Jangkhomang, 2012, p. 68). On the other hand, in Eastern India, megalithic cultures of the various indigenous groups of Jharkhand is also considered as they exhibit a continuous tradition. Groups like Ho, Munda and Oraons are notable for their practice of erecting megalithic structures even to this day. However, the megalithic tradition in Tibet seems closely related to the practices in Sikkim since Sikkim has always been culturally associated with Tibet in one way or another. Therefore, as Saul Mullard (2011) writes that Sikkim's culture largely resonates that of Tibet and hence it's imperative to look into Sikkim's past with Tibet at the backdrop of socio-cultural enquiry. Taking forward this discussion, the following sections will discuss the role of the megaliths in the region as well as the wider context and processes within which these traditions can be placed.

4.2. The megalithic culture of the Indian Subcontinent

The term megalith comes from the Greek work *mega* meaning big and *lithos* meaning stones (Renfrew, 1983, p. 152). In 1948, V. Gordon Childe (1948, p. 5) defined megaliths as large slabs or blocks of stones, either in their natural form of roughly quarried or trimmed. In the European context, megaliths are mainly associated with burial tombs in the Indian context, megaliths bear numerous functions.

Megalithic culture in India was first identified by Babington in Kerala in 1823. The typology of Indian megaliths is discussed by Krishnaswami (1949), Dikshit (1969), Moorti (1994), among others. The megalithic cultures are also site specific and exhibit heterogeneity in their characteristics (Mohanty, 2005). The South Indian megalithic culture is collocated with the Iron age due to the extensive use of iron implements accompanied by black and red ware (Rao and Marathe, 1989; Darshana, 2021). The South Indian megalithic culture was dated to 1000 BCE on the basis of 14C dating (Joshi, 2004-2005).

In the peninsular Indian context, Vidarbha megalithic culture is dated to 7th Century BCE. A distinguishing feature of this culture is the stone circles. With regard to the burial practices and grave goods recovered, P.S Joshi (2004-2005) mentions that they might have cultural links with South Indian megalithic culture. However, Vaidya (2014) opines that instead of using the term 'megalithic culture' to mark early Iron Age or Iron Age in South India and Peninsilar India, terms like 'megalithic tradition' seem more appropriate in the light of the fact that in many parts of India megalithism is still in practice.

Megaliths of Jharkhand have been of interest to scholars because it is a tradition which has continued till the present times. The megaliths are primarily associated with funerary and burial customs. At present it is observed that some of the burial customs involving megaliths are not practiced rather they are observed in relics that symbolize them. Megaliths in Jharkhand though have nearly always assumed sepulchral role, are also assigned other functions like that of fertility cult, as boundary markers, as stones for commemorative function, some bearing ritualistic functions and interestingly some are believed to be having astronomical functions. These megaliths are dated tentatively to the late phase of Iron Age to Early historic period. The grave goods comprise objects of copper, bronze, iron, beads and semi precious stones. In most part of the

subcontinent, the megalithic practices came to an end in the initial phases of the Christian era (Shekhar, 2021, p. 2).

Moving further along, the megalithic tradition of Northeast India is a continuous tradition. As Queenbala Marak and Jangkhomang (2012, p. 68) point out that the megalithic traditions of Northeast India is distinct in a way that it is a continuous tradition and it's difficult to assign any definite dates to them. Moreover, they are closely accompanied by myths, legends and folktales. They are assigned various functions some of which are ancestral stones, a fertility source, boundary markers, milestone markers, as a cult of the dead and as a cultural identity of the region. In addition to this there is also mention of a particular type of stone which was marked as adultery stones. They are erected at strategic places to mark and assert the occurrences of adultery (Sharma, 2017, p. 77). A robust account of the historiography of the megalithic types and their associated traditions of various groups of people across Northeast India before independence and after independence have been outlined by Jamir and Muller (2022, pp. 447-473). Besides, Jamir (2005) in a more concentrated investigation discusses the megalithic burial traditions of the Angami and Chakghesang Nagas from an ethno-archaeological perspective. With regard to Manipur, PB Binodini Devi (2019, p. 107-124) outlines the megalithic practices among different indigenous groups within the state of Manipur. Although she terms the megalithic tradition of Manipur as 'living megalithism' she also acknowledges that the context of the erection of megaliths have undergone changes from being a tangible manifestation of mortuary practices to being commemorative monuments in the present. Dwipen Bezbaruah (2003) in the context of the megalithic ruins of Karbi Anglong, Assam outlines various megalithic sites in the district with details of morphological characteristics while also tracing the ethnographic parallels at present.

Therefore, with regards to the megaliths documented in the study region of Sikkim-Darjeeling, the veneration or engagement with erected stones at present is found to fall within three groups.

1. A sacred space where rituals are performed on a daily basis
2. Sites of memory accompanied by rituals which are observed once or twice a year
3. Sites of memory which does not have rituals associated to them.

Devisthanas acquire a status of sacred space where worship and rituals are done on a daily basis, where there is a constant ebb and flow of devotees. Whereas in case of *Cherim* or *Tendong Lho Rum Faat* or *Udhauli Ubauli Pooja*, the ritual performances are observed once or twice in a year for a specific purpose thereby also making them sites of memory. Further along in cases of *Sokpa Dhunga* and Kabi Longchok, there are no visible religious ritual attributed to them routinely or ceremonially, although they are regarded as sites of memory. They evoke a sense of being sites where important events have taken place in the past and the collective consciousness acknowledge the significance. However, it may be noted that at present there are no new erection of megaliths to understand the process and techniques of erection, selection of stones and the customary practices around it, but the old megaliths have persistently served as sites for veneration and engagement by different groups occupying the region. Therefore, on the basis of this observation, the following sections will contextualise and discuss the potential role and functions of the megaliths vis-a vis the ones erected in the neighbouring regions of North East India and Tibet.

4.3. Megaliths as landscape markers and waymarks

Humans have almost always "marked, mapped and managed (their) territory" (Tacon, 2016, p. 218). The boundaries were at times natural in the form of rivers, mountains and the like whereas other times they were specifically marked by either fortifying, building walls or erecting structures

like megaliths. The material remains in the landscape left by occupants who have abandoned the site is also one of the determinants of the boundary of a settlement.

Mount Kanchenjunga holds great significance for the Lepchas, who believe that the first man and woman were created from its snow. They also consider places from where Kanchenjunga is visible to be particularly significant. Notable examples of such places include Tendong Hill and the Mahakala Dara temple, which offer clear views of Kanchenjunga. In addition to these practices, the Lepchas worship Kanchenjunga as the "biggest stone" in relation to the *longchoks*, which are believed to be sacred (Foning, 2003, p. 43). The fact which Bain (2020, p. 20) mentions that the longchoks were also erected as a substitute to the mountain in places from where Mt. Kanchanjunga was not visible, points towards the fact that they indeed functioned as a landscape marker. A 62 years old (age as in June 2022) resident of Daramdin while talking about the presence of *longchoks* in the past suggested that they were erected to mark places where slash and burn cultivation was carried out.

Citing the case of *Udhauli-Ubauli Pooja*, which shows implications of erecting stones while on the move across landscapes. The Udhauli-Ubauli pooja at present is performed in a different way but carries the essence of symbolizing the practice of a non-sedentary lifestyle. With reference to that, Van Dyke (2017, p. 738) states that pilgrimage routes often tend to leave trail markers in the form of shrines and structures. Quoting Furguson and Hart (1985, p. 51) she exemplifies this by giving an example of the route to Zuni Salt Lake in New Mexico, United States which is marked by numerous shrines along the route. Therefore, these megalithic structures which were erected along a route or on the wayside must have functioned as a milestone or a signpost guiding the travelers along a route. Much like in the case of Blood Brotherhood Treaty of Kabi Lungchok,

which was an attempt of its first kind to enter a region that was proclaimed as a "sacred hidden valley" (Mullard, 2011) in the Tibetan religious discourses, there exists a possibility that it may be an attempt to show the way to future comers who wished to enter Sikkim for various reasons, or in the case of *Udhauli-Ubauli* Pooja where the travelers left a mark of their presence in the landscape as if leaving a trail for the succeeding groups to follow or the menhirs on the way to Tendong Hill possibly for the purpose of guiding travelers to the top of the hill and to attest the sanctity of the place. Therefore, the megaliths also effectively served as the beacons of hope and guidance to the travelers.

For instance, in case of Kabi Lungchok, before entering Demazong, Gyad Bumsa and Jomo Guruma is said to have constructed a monastery at Khampajong known as Pakshi Gompa subsequent to which they are said to have lived in Chumbi valley for three years. The fact that on the way to Demazong, the building of a Monastery and the erection of *longchoks* marks assertiveness on the part of Gyad Bumsa to leave an eternal legacy and claim that territory for their usage.

Sikkim's identification as a hidden land, especially significant to Tibetan interests stems from the legitimization of migration through references to *termas* attributed to revered figures like Padmasambhava or Guru Rinpoche. Identifying a place as a hidden paradise had its own share of religio-political significance, for Bayul was created to act as a safe haven in times when religion was in dire straits (Mullard, 2011, p. 9). This illustrates the fact that shaping and control of landscapes, including social, political, economic and religious aspects, through the imposition and normalization of discourses and narratives are methods employed by dominant powers to maintain their authority over terrains which highlights a continuity of cultural formation, rendering it an ongoing and dynamic process rather than a static one (Robertson and Richards, 2003, p. 7). The

endeavours of Gyad Bumsa and his father, in their quest for Sikkim involved a strategic erection of landmarks along the route, notably in the form of *Gompas*, a residence and ultimately the *longchok* which was done perhaps to establish a reliable passage for individuals traveling from Tibet to Sikkim.

The erection of *longchoks* is substantiated with examples from Tibet. In the Tibetan landscape, such landscape markers are termed as *Lha-t'o.* They are found along the mountain tops and hill tops. Mark Aldenderfer (2003, p. 5) argues that the process and context of erecting stones was rooted in the belief of the protective powers of *yul lha*[v] or the worship of mountain deities. However an important observation made by the same author is that the standing stones by far are not found in association with any settlements but rather stand alone on the mountains/hills or mountain passes. Citing Bellezza (2001, pp. 130-47; 2002, pp. 76-78), Aldenderfer (2003, p. 8) notes that in none of the sedentary villages could one find a standing stone. This is in contrast to the the megalithic traditions in North East India, especially with regard to Konyak Nagas, where at the entrance of the village a megalith termed *thaolong*[vi] was erected at the time of setting up the settlement (Wangjin, 2014, p. 322) and the Mizos where the chief erects a megalith at the entrance of a village (Malsawmliana, 2014, pp. 376-384). This becomes an important analogy to analyze the sporadic occurrences of megaliths in Sikkim-Darjeeling considering the fact that that the Lepchas practiced slash and burn cultivation for which they extensively moved around the landscape.

Secondly, the places which are deemed sacred by the community is marked on the landscape (Dyke, 2017). Karl Ryavec (2018, p. 1) while investigating the viewsheds of mountaintop tombs derived with the help of GIS in Western Tibet notes that the 'mountaintop tombs' are in fact ceremonial monuments. The tombs are made of stones and their tops are flat. They are aligned in

a particular cardinal direction. Ryavec (2018, p. 1) also notes that the arterial routes radiating from the main route aligned with the mountaintop tombs which led him to hypothesise that they may possibly have been designed to serve as beacons for travelers. Giuseppe Tucci (1999, p. 729) notes that mountains were of prime importance to the pre Buddhist cultures of Tibet. They either believed mountains to be their ancestors or that their ancestors descended from the Mountains. Therefore, Bon culture alluded the mountains to be Gods or the abode of spirits and the occasional existence of megalithic monuments on the mountains passes complements the sanctity bestowed on the mountains. Similarly, the erection of *longchoks* in places connected to Mt. Kanchenjunga implies the fact that these places were either sacred or vital in terms of its alignment with the cardinal directions. Similarly, in the case of Jharkhand megalithic culture, Das (2017, p. 370) notes that a prerequisite for erecting a megalith was the presence of a hill. In the imaginative geography of the Santhals, the hills represent different body parts of the Mother goddess and these megaliths aligned to a certain hill which has sacred significance. If in case they are not aligned to a hill, then they are aligned in a cardinal direction. However, in serving as a landmark in the landscape, the megaliths also assume a dual role of a signpost or a waymark to guide the travelers through the route.

It is well known that the movements and routes are tracked, and the connecting points are marked with indicators such as erected stones, sacred groves, similar names or referred to in myths and stories (Tilley, 1994, p. 30). The humanized spaces are thus constructed by constant production and reproduction of the inhabitants' movements and activities endowed with social meanings in the form of myths, legends, and tangible and intangible symbols. With this in mind, we may draw analogies of the megaliths being a route marker to the concept of *Lha tu*. The term *Lha tu* is perhaps derived from the Tibetan word *lha tho-* megalithic structures which were erected on routes in Tibet

as mentioned by Siiger (1956, p. 44) citing Tucci (1949) and Roerich (1930). They are heaps of stones placed along a route mainly in the mountain passes.

Lha tos are basically megaliths in the form of cairns or menhirs found on mountain tops and hill tops to guide the travelers (Macdonald, 1966). These are erected not only on the passes but before a bridge or a ford. It is also often found before a *chhorten* or a pilgrimage site. This is similar to the *Lapchaos* that the Lepchas believe in where heaps of stones are placed on routes frequented by people. George Roerich (1931, p. 355) in Trails to Inmost Asia note the fact that he saw the megaliths along pilgrim routes like the one going towards Kailash. He notes the existence of grey granite menhir surrounded by small columns of white quartzite in a village named Sago and the abode was ascribed to Phalden Lhamo – a protector Goddess of the Vajrayana pantheon. In Tibet, the pre-Buddhist sites are considered as Buddhist sites which are believed to be the dwelling places for different divinities of the Buddhist pantheon (Roerich, 1931, pp. 401-445). The author also notes A.H. Francke's remark that people of Western Tibet traditionally had a custom of erecting crude stones on the wayside in the memory of a dead person.

4.4. Megaliths as Boundary markers

Secondly, Megaliths in Sikkim are also perceived as boundary markers. Boundaries along natural features in the landscape signify the choice of habitable lands and spatial connections of routes (Tilley, 1994, p. 17). These territories encompass spaces with a perceptible boundary that is intended to deny access to anyone who does not belong there (Zedeno, 2016, pp. 210-217). Therefore, boundaries, whether natural or human made have also been the subject of myths and stories harbouring supernatural occurrences/events (McCarthy, 2016). In the case of *Sokpa Dhunga* the presence of a megalith in Samanden has evoked layered meanings to the landscape,

thereby weaving narratives and tales about what event must have occurred in the past to have left these tangible evidence(s). The story or Sokpa Dhunga talks about human-non-human contestation for resources resulting in the erection of a boundary stone to demarcate habitable land from forest land. The non-human party here is the mythical Yeti, known by different names to different groups of people inhabiting the upper reaches of the Himalayan terrain. Naming a place becomes a marker of individual or collective experience, indicating active or passive human presence in the past (Stewart and Strathern, 2003; Tilley, 1994). The Yeti in this story may mean a different group of people trying to seize this portion of land. The creation of boundaries is concurrent with the concept of otherness and cultural difference, hence, the physical confrontation between the Lepcha shaman and the Yeti likely symbolizes an actual conflict between two groups of people leading to the demarcation of 'our and their' territory. This has led to demonizing the other party in legends such as that of the *Sokpa*. As noted by Siiger (1956, p.44), in Dzongu, North Sikkim, *Mung* (evil spirits) of "Bhutanese, Nepalese, and Limbu origin" featured in ritual incantations which often portrayed quarrels of the Lepchas with these communities. The legend of Sokpa Dhunga in Samanden also talks about 'treachery'. A deal was made between the people and the Yeti to bring peace. Perhaps that party was 'stronger' leading the 'weaker' party to resort to treachery to gain an advantage. Megaliths were erected as a sign of victory over an enemy who is today defined as 'mythical'. Thus Sokpa Dhunga reminds the present population about the powerful enemy, about the treaty agreeing to share resources and the treachery with which the enemy was killed, marking the place safe for the winning party. Moreover, people demarcate territories and tracts of land they can call their own, generally not large tracts of land but more specifically a specific feature on the landscape (Tilley 1994, pp. 38-39). Considering the location of Samanden, a small inhabited tract surround by dense pine trees, it may be speculated that this

place could have served as a site for slash and burn cultivation which was a common practice among the Lepchas. Hence, the megalith at the end of the settlement could be a deliberate attempt to delineate the perimeter of the slash and burn patch. However, this remains a supposition at present which needs further engagement to arrive at a definite conclusion. The stories and 'spatial practices' are intertwined where the stories are kept alive through their association with the places, and these places exist by dint of their mention in the stories (Tilley, 1994, p. 33). The mythical element is often rooted in the tangible material evidence(s) associated with the place, which is told and retold in the form of stories, myths and legends.

In the Tibetan context, Aldenderfer (2003, p. 3) documents that *dorings* and menhirs were erected to mark the boundary between Tibet and China where some of them are said to have inscriptions on them. In the context of European prehistory, megalithic tombs have been interpreted as territorial markers, reflecting the territorial behavior of the societies that constructed them (Renfrew, 1976, pp. 198-220). Similarly, historical perspectives on the use of stones in megalithic constructions have highlighted their significance as markers of sacred or territorial claims, indicating a veneration of stones in ancient times (Wallhouse, 1878, p. 34). These boundaries are closely linked to notions of otherness and cultural distinctions, often interwoven into myths and tales filled with supernatural events. In view of this, in the highlands of Guatemala, stone structures called *mojones* were erected in the past to demarcate agricultural fields cultivated by different families which at present have assumed sacred implications as a remnant of pre-colonial and/or ancestral remnant (Frühsorge, 2015, pp. 178-79). In some cultures of North East India, such as the Nagas, the preference for stones over other materials for megalithic structures is rooted in their belief that erected stones embody supernatural power (Khongreiwo, 2014, pp. 292-314). Natural objects like stones play a vital role in the creation of these boundaries, serving as symbols of

territorial identities. The durability and impregnability of stones have consistently represented power and permanence throughout history. Therefore, the megaliths erected across Sikkim-Darjeeling region could well be a marker to mark and demarcate the boundaries of a place. Furthermore, these megaliths also serve as tangible representation(s) of the legends and memories embodied in the region's cultural narratives.

4.5. Continuity of material evidence

The concept of continuity encompasses both a transformation of the present and an illumination of the past. In shaping the present, people may simultaneously be constructing a past that aligns with and explains their current circumstances. A continuity of usage of material remains, therefore, may disclose an additional dimension of the past—one that is not solely concerned with historical events but with the interpretive frameworks through which it is understood and rendered meaningful. This intersection of the past and present provides a lens through which cultural memory operates.

Change and continuity, as Khazbulatov and Nurpeiis (2012, p. 15) asserts, is facilitated by cultural memory. This continuity is crucial for the transmission of cultural values making it an essential part of people's lives. It is necessitated by a sense of preserving the past either by way of direct replication as in the case of ritual performances or indirect transmission by way of collective remembrance in the form of oral traditions. Therefore, when material culture is transmitted inter generationally, it is not only the object itself that holds significance but the intangible cultural knowledge associated with it.

Therefore, leveraging the idea that megaliths in the region are material markers on the landscape or as Van Dyke (2017, p. 739) calls it 'memory anchors' which are engaged and re-engaged regularly, they also function as sites of memory where people participate in collective activities. They are places to inherit and maintain continuity with regard to the knowledge of the past. The presence and recognition of the sites of memory itself implicates continuation of material remains. Therefore, they reflect evolving and varying interpretations within different cultural and temporal contexts thereby having a life history of its own. As such, intangible traditions which are associated with the material are dynamic in nature encompassing change as well as continuity within it (Herle, 1994, p. 1).

The most important aspect of sites of memory however is the intersection of material and memory. The memory is triggered by the presence of a material marker which evokes stories and anecdotes about ongoing human interactions with the material and subsequently the landscape (Rowlands, 1993; Jones, 2007). Moreover, there are different ways in which cultural memory or remembrances can be grouped. Winter (2010) classifies the act of remembrance into two categories:

1. Historical remembrance
2. Liturgical remembrance

Places of historical remembrance are sites where historical events have taken place. In this regard, Kabi Longchok can be attributed to be a site of historical remembrance where two leaders of different groups forged a friendship which thereon changed the socio-political and cultural dynamics of Sikkim. Sites of liturgical remembrance are those where the public engage with ritual practices or customs that have persisted for long periods. Tendong Lho Rum Faat or Cherim are examples of such sites of liturgical remembrance where ritual practices continue to preserve

cultural continuity. As such, ritual spaces which serve as important sites for examining continuity of material aspect of the past generally have proscribed and prescribed norms within which a custom or a ritual is carried out. Thus, elements associated to the divine exhibit a degree of permanence and are not easily changed in time. They are public functions which are highly visible and repetitive in nature. However, they are also sites of changes and transitions brought about by contingent groups of people across time. For examples when materials are being reused or repurposed, it is possible to infer the historical and cultural shift that may have brought about the change and transformation. For example, the case of *Devithanas* of Darjeeling present a case of such transformation. The trajectory and the shift to a different mode of veneration that happened, where, the purpose of an erected stone changed from being a *lha tu* or a landscape marker for one group of people to an object containing divine and spiritual connotation for the succeeding group. This shift signifies a change in both the social and religious practices over time.

Similarly, in *Udhauli Ubauli Pooja* containing different elements of Kirata culture (Dahal, 2021) juxtaposed with Lepcha liturgical elements highlights how sacred practices have adapted in response to cultural and religious shifts. This transformation therefore is not only about physical change but also the reinterpretation of the sacred as material markers continue to evolve with the changing spatio-temporal contexts.

The intrinsic significance of the sites of memory lies in the material aspect of its existence and these material evidences of the past aid in the process of transmitting the intangible knowledge thereby illustrating cultural continuity. Nicolić (2018, p. 1171) in this reference while discussing the function and capacity of artefacts in the process of cultural transmission argues that artefacts play a primary role in cultural transmission even in the absence of active transmitters which

necessitates a distinction to be made between artefacts as an 'evidence of' or 'a role' in the process of cultural transmission. However, in the absence of intergenerational contact, like in case of Samanden's *Sokpa Dhunga* where the context seems to have been lost, the interpretation of material expressions are based on the reconstruction of the cultural elements as perceived by the people at present.

To gain a deeper understanding of the phenomena or change and continuity examining similar phenomena in different contexts is insightful. In Karbi Anglong, Assam for instance, Dhritiman Sarma (2014, p.93) highlights that in Donkamukam in Karbi Anglong, tridents (which usually pertain to Hindu rituals) are seen in front of megalithic structures. These structures have also become sites where ceremonies like *Shivaratri* and *Janmashtami* are celebrated which he ascribes to be a result of the influence from Nepali, Bengali and Assamese people who inhabit the place along with the Karbis (Sarma, 2014, pp. 93-95). Similarly, in Hazaribag District of Jharkhand, the Hindus of the vicinity call a certain place Purni Mandar which translates to old temple and the megaliths in the form of menhirs are worshipped by the Bhuiyan community as a sacred object. A similar belief is seen in the Santhals of Chano, Hazaribagh district who believe megaliths to be the abodes of their Gods and worship them as temples. Likewise, in Tamil Nadu-Kerala, megalithic sites have been appropriated as Brahmanical shrines, as Rajan (2013) argues that indigenous cultures which precede Brahmanical religion does not have the practice of constructing a shrine for liturgical purposes. Moreover, the megalithic structures of Tamil Nadu-Kerala border region are replete with myths and legends of fairies and dwarfs inhabiting these structures which gives a sense of the fact that these structures might have predated the prevailing beliefs that is in place. Bellezza's (1995) account in Tibet with regard to Doring[vii] also illustrates how megalithic structures which were once venerated by the indigenous populace and extensively documented by

George D. Roerich between 1925-1928 were nowhere to be found when Belleza revisted it. The priests of the nearby monastery denied knowing about the existence of *Do-rings* (the very name of Menhir in Tibetan) in the place and as Bellezza (1995, p. 32) recounts:

> *Though Doring and Chhorten Gyapa occupy the same geographic co-ordinates, they share little resemblance. What happened to Roerich's megalithic site?*
>
> *There is only one explanation. Sometime in the last 70 years, Doring was purposely altered to create Chhorten Gyapa.*

Cultural memory like cultural landscapes is shaped by human intervention in the environment. They are not merely physical features but can be understood as 'cultural images' which serve as repositories of layers of meaning, reflecting the historical and cultural narratives woven into them and in turn exert an influential role in shaping the nature of these activities ((Richard and Robertson 2003, pp. 1-18; Rodning, 2010, pp. 180-190). Recognizing this aspect helps us understand that the arrangement and alteration of the landscapes are intertwined with individual, social, cultural and political factors, offering insight into the societal dynamics of the past and the continued interactions in the present (Tilley, 2006, p. 7).

Cultural memory of the past cannot be confined within a fixed framework. It fosters remembering and forgetting of events as and how it suits the members of the group in that particular time, space and context, which is why, groups continually negotiate and reconfigure their relationship with the past in relation to the already existing sites of memory. In this connection Apaydin (2020, p. 16) notes the example of Catalhoyuk in Turkey where the living population although has no connection to the history or memory of the site, regards the site as an important part of their daily interactions

with the landscape. Much the same way in which people in Samanden have a degree of reverence for *Sokpa Dhunga* although none of the present inhabitants of the place know who, when or why *Sokpa Dhunga* was erected in that place. However, the regard for the unknown is discernible from the fact that at present *Sokpa Dhunga* is wrapped with *Khada* and frames and idols of Hindu Gods and Goddesses are kept along with the remnants of incense sticks. As is also the case with Mahakala Daara temple where the *lha-tu* was transformed into a Buddhist monastery and then into a Hindu Temple, but the existence of the *lha tu* has been forgotten over a period of time.

The continuity of the material culture in case of Devithanas can be posited to have taken place because of two reasons- the stone erected might have been considered as sacred by subsequent communities who encountered the site and secondly, in the absence of the Lepchas, their pre-existing sacred site is transformed into a *devisthana*. This point finds alignment with Foning's assertion (2003, p. 48) that *longchoks* being the *lha thus* in the past, which, when forsaken by the associated group of people were taken over by people practicing other faiths. Tina Harris (2013, p. 18) while articulating the importance of place making and geographical imagination in the creation of region(s) opines that contending groups strive to enhance the visibility of the land. She asserts that territory or a site is not a static entity. It thrives on continuity and dynamic interactions between people and places.

In the case of *Devithana* we see such an example of continuity with re-contextualisation of erected stones to connote a Hindu sacred place. The practice of erecting stones inside the jungle either singularly or in the form of heap of stones/ pebbles have known to be for the purpose of guiding travellers and hunters along their journey (Tamsang, 2008). A noticeable fact is that *Devithanas* are either located inside the forest and are often associated with a water source like a spring, stream,

to name a few. In this regard, Bentley (2011, p. 17) while describing the scared landscape of the Lepchas, highlight the fact that the abode of the guardian deities is believed to be on the ridge, hill, water body or any other natural features that define the actual boundaries of a village and other supernatural beings are believed to inhabit the hills, forest and water sources within the bounds of the village. Thus, it can be posited that the *Devithanas*, characterized by their erected stones and situated in one of the aforementioned geographical contexts, may represent sites of Lepcha origin that have subsequently been adapted and transformed into devisthanas. These reconfigured sites therefore indicate an intersection between the cultural practices and the significance of these locations in the belief system of the inhabitants.

Moreover, according to Lyangsong Tamsang the very word 'Lapche' is derived from the word *Lapchao* which in Lepcha Language means resting place or a waiting place (Tamsang, 2008). Therefore, could these monoliths be an evolution of the heap of stones that guided the travellers along the way? Concomitantly, the liturgical value of the *Udhauli-Ubauli Pooja* is hypothesized to be linked to its role in guiding the people leading non-sedentary lifestyle. This aligns with the narratives that depict *Lha tus* in Tibet being placed along a route serving as a resting points for travellers.

Apart from the Mahakala Temple in Darjeeling, there is, however, insufficient evidence to definitively establish that the elongated stones found in the *Devithanas* across the Sikkim-Darjeeling Himalayas were originally Lepcha *longchoks* that have since been repurposed for the establishment of *Devithanas*. However, it is noteworthy that there appears to be no established custom of stone worship within Hindu practices in this region. Consequently, it may be posited that the reverence for stones observed in the *Devithanas* could have been influenced by the

traditional veneration of *longchoks* among the Lepcha community. Moreover, the similarity in the morphology of the small megaliths with that of the *Lingas* finds an easy way of explaining the transforming the Megaliths into shrines associated. This hypothesis however, invites further investigation into the intermingling of cultural practices and their adaptations across different belief systems in the region.

The story of the Megaliths includes an interplay of multiple beliefs, thoughts, values or symbols. It might be used as a cultural identity marker to which a physical space is allotted. It offers a rephrased account of a space or a tangible object surrounded by innumerable intangible knowledge and traditions that persist to the present day. The cultural continuity of the megaliths enables us to look into the phenomena from different perspectives and parameters. Probing into the reasons the phenomena of conversion of the indigenous people to a dominant religious faith cannot be overlooked. From 18th Century onwards, officials of East India company and the Christian missionaries, pouring into the hills of Sikkim-Darjeeling, led people from Lepcha community to adopt Christianity which facilitated the discontinuation of many a different practices and traditions which were a part of the indigenous ways of life (Gurung, 2013, p. 131-142). This conversion or shift in the faith led to the physical alteration of the site alongside its significance and credence being transformed to a completely different set of meanings. This claim is reiterated by Foning (2003, p. 48-49) where he states that the size of the stones has reduced considerably owing to the Lepchas adopting other faiths or the influence of modernism which has led to reluctance in the continuation of traditions. Similarly, In Nagaland, as Devi and Neog (2014, p. 340-351) mention that the practice of erecting Megaliths was discontinued when the Lotha Nagas adopted Christianity as their faith. Among the Ao Nagas, the Christian missionaries considered stone erecting and feasting as sins which could not be atoned for. The abandonment of one set of

beliefs and practices is one aspect of cultural change. The transformation of the landscape, site, or a region is often a conscious decision by the inhabitants (Nelson, 2000, p. 55) and in this case, transforming the existing land/landscape by abandoning the practice(s) associated with the megaliths as well not erecting any more megaliths was a decision that enabled the successors of the lands to use or occupy the space in a different way since abandoning a space does not mean that it will not be used in the future (Nelson, 2000, p. 57).

The erection of stones which is an imperishable and an abundant resource, commemorated the interactions among the inhabitants signifying a strong sense of territoriality among the groups. Owing to its durability and sturdiness, the structures of stone also signified power and permanence. Scholars have ascribed the use of stones as a mark of 'human ordering of nature' and because of its omnipresence in the landscape which was a convenient resource rendering it as an important cultural artefact (Berleant, 2007). The significance of stone structures in the lives of indigenous communities of South Asia is highlighted by the fact that it is a potent means to remember the events of the past and people associated with it. An example of this comes from the Khasi culture in Meghalaya where the word for remember – *kynmaw* and the word for memory - *jingkynmaw* are both rooted in the word stone (Burke, 2014, pp. 360-375). The etymology of the word is *kyn*- to mark and *maw*-stone. Now the word for memory is *jingkynmaw* which translates to "an abstract thing marked with stone" (Burke, 2014, p. 361). However, contemporary developmental initiatives pose a grave threat to their preservation, as noted by Sharma (2017, p. 76).

4.6. Summary and Conclusion

In conclusion, this chapter has explored the megaliths of the Sikkim-Darjeeling Himalayas, highlighting various practices surrounding these structures and their significance for cultural

continuity. Despite the existing gaps in documentation and research regarding the megalithic cultures in this region, this study has sought to fill that void by drawing parallels with studies from various contexts, particularly those from other cultures in Northeast India, Jharkhand and Tibet. While it is essential to note that the Lepchas in the region predominantly erected and venerated the megaliths, we find them repurposed and adapted to various other contexts over time. The megaliths that we mention here, much like its Northeast Indian and Jharkhand counterparts have not been chronologically dated due to the continuity of its use, except for one – Kabi Longchok, which scholars like Namgyal and Dolma (1908) and Mullard (2011) have ascribed to be from the 13th Century.

The historical and cultural ties between Sikkim and Tibet have likely influenced the megalithic practices of the region. The Tibetans, who have known Sikkim since the 8th century CE, refer to their menhirs as "*Doring*," while the Lepchas call them "*Longchok*." Both groups recognize certain megaliths, called "*Lha-t'o*" or "*Lha-tu*," placed on mountaintops or passes as symbols of divinity or sacredness. The practice of erecting megaliths for ceremonial purposes, as seen at Kabi Longchok, mirrors similar practices in Tibet, such as the erection of stones to swear fidelity or mark agreements, as recorded in the chronicles of Tun Huang. This shared terminology and practice suggests significant cultural exchange between the Tibetans and Lepchas.

The chapter has also explored the role of megaliths as landscape markers, pathfinders, and sites of memory, drawing on examples from the regions mentioned above. These structures, as artefacts of deep time, embody stories, customs, and rituals passed down through generations. While it is not appropriate to directly link the megalithic cultures of Sikkim-Darjeeling with those of Northeast India or Jharkhand, given the distinct mortuary functions of the latter, we find

similarities in the symbolic roles of the stones when considered within Tibetan cultural contexts. As regards the megalithic traditions of various tribes of North East India and Eastern India, what is discernible is the fact that a diversity of stone monuments like menhirs, dolmens, cists, alignments among others assume different roles like burial purpose, seats of power, settlements markers, fertility stones and as astronomical observatory, indicating a complex system rooted in megaliths as a major material and cultural artefact.

Despite these connections, one fundamental aspect of the megaliths of the Sikkim-Darjeeling region discussed in this study is the fact that their sepulchral role has not emerged as the prominent feature. They primarily serve as landscape markers and sites of liturgical activity, with fewer clusters of megaliths compared to Northeast India or Jharkhand. This difference may be due to the sparse archaeological investigations in the region. Future studies and investigations are necessary to uncover the full extent of these megaliths' presence and functions in the region.

Chapter 5

Scientific Analysis of artefacts – Pottery, soil and charcoal

5.1. Introduction

This chapter focuses on the analyses of pottery sherds, soil samples and charcoal samples collected from an agricultural field in Daramdin Village. Four samples are taken for scientific analyses. Since the pottery sherds were found up to 80 centimeters, i.e., the first three layers and the last layer did not yield any pottery sherds, the fourth specimen is a black coloured pottery found between the depth of 20-40 cm from the surface of the ground. The same samples have been used for all the analyses that will be discussed in detail below. Similarly, soil samples too were collected. There are five soil samples since the Test pit excavated is 100 centimeters deep from the surface. The pottery sherds are named DRD P.1, DRD P.2, DRD P.3 and DRD P.BP. 'DRD' stands as the short form of Daramdin and the 'P' for pottery. 'BP' in the fourth sample stands for Black coloured pottery. Similarly, soil samples have been named as DRD S.1, DRD S.2, DRD S.3, DRD S.4 and DRD S.5. In this, 'S' stands for Soil sample.

The archaeological pottery of Sikkim and neighbouring regions remains largely unexplored. Consequently, pottery sherds discovered in Daramdin lack comparative frameworks for the evaluation of their form, color, and texture, and other essential elements in discerning manufacturing techniques, provenence and relative chronology. Given the dearth of prior investigations or literary references, such as historical accounts, the scientific analytical methods are instrumental in facilitating the analysis of pottery sherds. By applying this systematic methodology, researchers can elucidate various dimensions of pottery production and distribution in this area.

Therefore, the objectives highlighted in this section are as follows:

- To determine the chronological placement of the artefacts – pottery sherds.
- To understand the provenience of the pottery sherds as to whether the pottery was produced in the region that they are collected from.
- To understand the manufacturing techniques of pottery production especially its firing temperature and firing conditions.

To find answers to the questions above, the methods like Radiocarbon dating using Accelerator Mass Spectroscopy (AMS), X-Ray Diffraction (XRD), Energy Dispersive X-Ray Spectroscopy (EDS), Fourier Transform Infrared Spectroscopy (FTIR), and Thermogavimetric Analysis – Differential Scanning Calorimetry (TGA-DSC) has been used. Each of the methods, results and discussions are enumerated in the subsequent sections.

5.2. Scientific Analysis of Pottery and Soil Samples

Pottery as artefacts tells us much about the technological aspects, function, socio-economic and cultural aspects of a society. The study of pottery gives us a fairly rich account of the time and space it was manufactured. One of the fundamental ways in which pottery can be studied is by looking into its technological aspects. It gives us a holistic idea about chronology and date (when the artefact was produced), provenance (where it was produced) and technology (how it was produced). Therefore, this chapter intends to analyse the pottery sherds found from Daramdin, in Soreng District in Sikkim which will help us in understanding the elemental and mineralogical characteristics of the pottery will facilitate our understanding of the provenance and technological aspects of pottery production in the region.

5.2.a. Energy Dispersive X-Ray Spectroscopy (EDS)

Energy Dispersive X-Ray Spectroscopy is a method of identifying the elemental composition of inorganic materials (Davit, Turco, Operti, Chelazzi, & Bombardieri, 2014), which in this case are pottery samples and soil samples. The instrument used is Field Emission Scanning Electron Microscope (FESEM) coupled with OXFORD EDS in the model Sigma manufactured by Zeiss. Since FESEM gives us the microstructure and morphological features of the materials, only EDS is taken into account. For the preparation of pottery samples, it was mounted on to aluminum stubs with the help of double sided carbon tapes which act as a good adhesive for the samples as well as provide good conductivity since the samples to be analyzed require to be electrically grounded. Thereafter, it is sputter coated with gold which prevents the surface from charging (and enables good conductivity) and provides an even surface for analysis.

The similarity or dissimilarity in the contents of the ceramic and the soil will indicate whether the potsherds were manufactured locally using soil from the same or surrounding region or whether they were brought from elsewhere which would then open floodgates to a myriad of questions of a network of communication between Sikkim and the neighbouring regions or would differ from an earlier discourse that Sikkim possessed no tradition of the art of ceramic production (Sharma, 1996).

Elements	DRDP.1 (%)	DRDP.2 (%)	DRDP.3 (%)	DRDP.BP (%)
Oxygen	47.41	50.95	46.65	47.35
Carbon	16.70	--	--	21.22
Silicon	20.16	19.00	18.85	16.98

Iron	3.83	14.23	13.41	1.25
Aluminium	9.86	12.47	19.20	12.10
Potassium	0.76	0.45	0.85	1.05
Bromine	1.06	1.93	--	--
Magnesium	0.16	--	1.00	--
Phosphorus	--	0.95	--	--
Total	**99.94**	**99.98**	**99.96**	**99.95**

Table 5. Elemental composition of pottery samples

The associated soil is analysed using the same instrument for elemental analysis. The samples were collected from a section profile of an agricultural terrace of Daramdin from where the potsherds were also collected.

Elements	**DRDS.1 (%)**	**DRDS.2(%)**	**DRDS.3(%)**	**DRDS.4(%)**	**DRDS. 5(%)**
Oxygen	37.07	51.03	51.02	55.52	53.86
Carbon	--	10.29	11.00	5.74	--
Silicon	30.54	23.57	21.25	21.24	22.90
Aluminium	7.71	10.14	9.81	12.84	11.45
Iron	23.42	3.20	6.22	3.33	8.90
Potassium	0.85	0.97	0.66	0.70	0.88

Bromine	--	--	--	--	--
Magnesium	--	--	--	0.28	0.35
Phosphorus	--	--	--	--	0.26
Niobium	0.40	--	--	0.35	--
Calcium	--	0.10	--	--	0.86
Tantalum	--	0.28	--	--	--
Zirconium	--	--	--	--	0.21
Total	99.99	99.61	99.96	100	99.67

Table 6. Elemental composition of soil samples

It has been observed from the analysis of the pottery and soil samples that the elemental compositions of the two samples are similar in terms of macro contents. While Oxygen (O), Silicon (Si), Aluminium (Al), Iron (Fe) and Potassium (K) are present in all the samples, two of the pottery samples contain trace amounts of Bromine (Br) and one sample contain Phosphorous (P), which are noticeably absent in soil samples except for DRD S.5. The soil samples too contain trace amounts of Calcium (Ca), Tantalum (Ca), Niobium (Nb), Magnesium (Mg) and Zirconium (Zr) which are found absent in the pottery samples. In order to corroborate the elemental identification, X-Ray Diffraction was carried out which, apart from mineral identification and characterization also proposes the range of firing temperature and the firing atmosphere of the pottery.

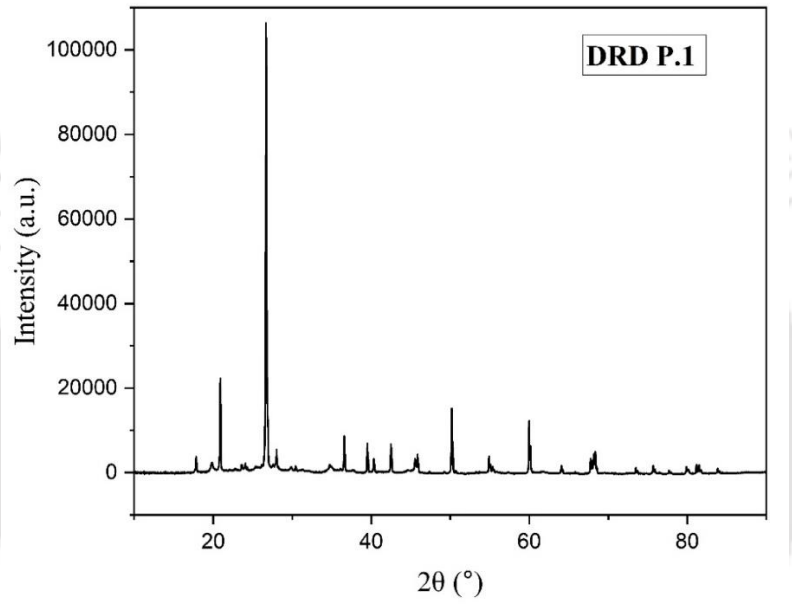
5.2.b. Powder X-Ray Diffraction (pXRD)

pXRD is a characterization technique which help us understand the mineralogical composition based on their crystalline structure and different mineral phases (Singh & Sharma, 2016; Rahim, 2016; Sathya & Velraj, 2011; Tamilarasu, Anbarasan, & Velraj, 2017; Portillo, et al., 2018; Panda, et.al., 2013). Microanalytical techniques detect a diverse range of activities and anthropogenic behaviours thereby helping us reconstruct various aspects of the societies in the past (Shillito, et. al., 2009). In Archaeology, it is specifically used to understand the provenance and origin of the raw materials. Provenance studies give us an idea of the manufacturing technology and the raw materials present in it especially pertaining to firing temperature and the conditions in which it was fired (Vecstaudza, et. al., 2013; Raad & Makarewicz, 2019; Tamilarasu, Anbarasan, & Velraj, 2017; Ichikawa, Sakito, & Kurisaki, 2019). On a larger scale, it helps us understand the trading routes and the networks of communication by means of micro analysis of the material remains (Raad & Makarewicz, 2019). On the other hand, the different crystallographic phases of the minerals ascertain the raw materials used by people in the past and the manufacturing technique employed by them by discerning the changes in the crystallographic phases which also changes the mineralogical composition of a material (Sathya & Velraj, 2011; Singh & Sharma, 2016). The changes in the mineral composition are irreversible and occur due to various factors, the most important of which is heat. When a material is fired above its original firing temperature, it either reacts to form other minerals or gets destroyed (Bayazit, et. al., 2013). Thus, identifying the mineralogical composition and the crystallographic phases with the help of XRD proves to be a vantage point in this regard.

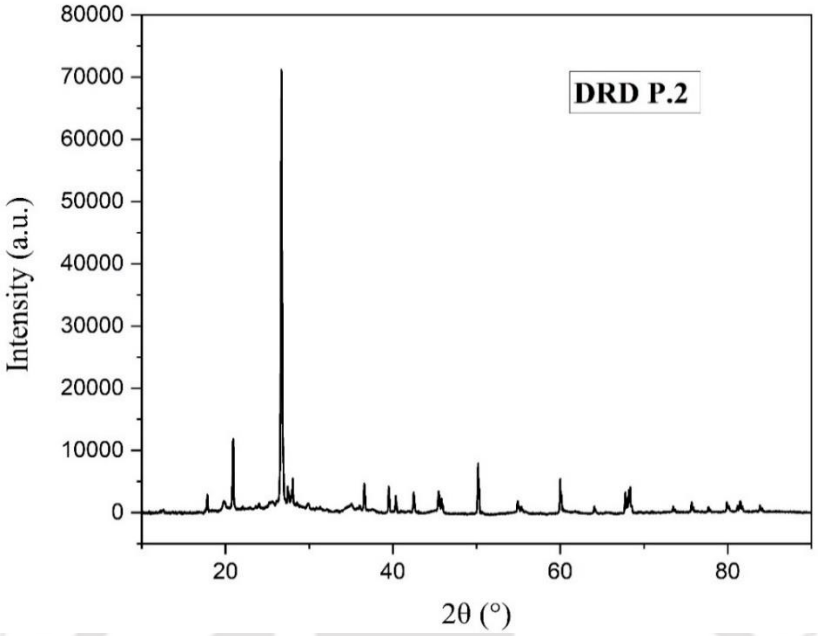
In the subsequent sections, four pottery samples collected from Daramdin, West Sikkim were studied with the help of X-ray Diffraction technique. They were subjected to X-Ray Diffraction

using Rigaku Smartlab X-Ray Diffractometer with the wavelength (CuKα) of 1.5406Å. 2θ range was determined from 5° to 90°. The sample was in the powdered form. The *d*-value (interplanar spacing) was determined using Bragg's law i.e., **nλ=2dSinθ**. The *d*-value of the detected peaks are as follows.

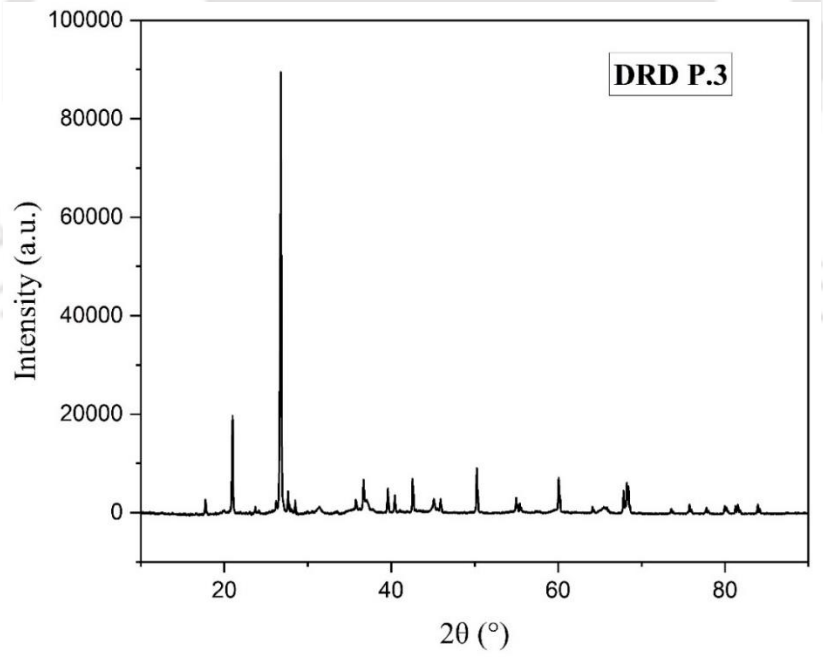
XRD Graph for Pottery from Daramdin (DRD P) are given below.



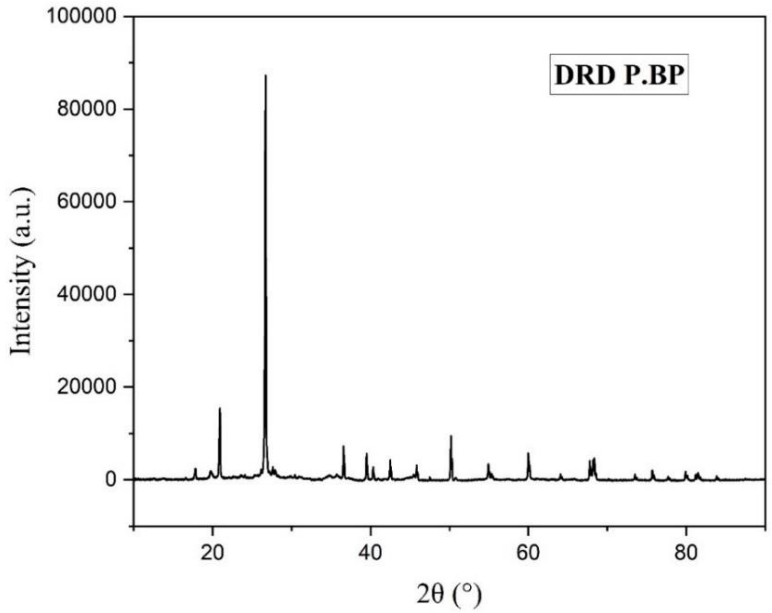
Graph 1. XRD graph for DRD P.1



Graph 2. XRD graph for DRD P.2

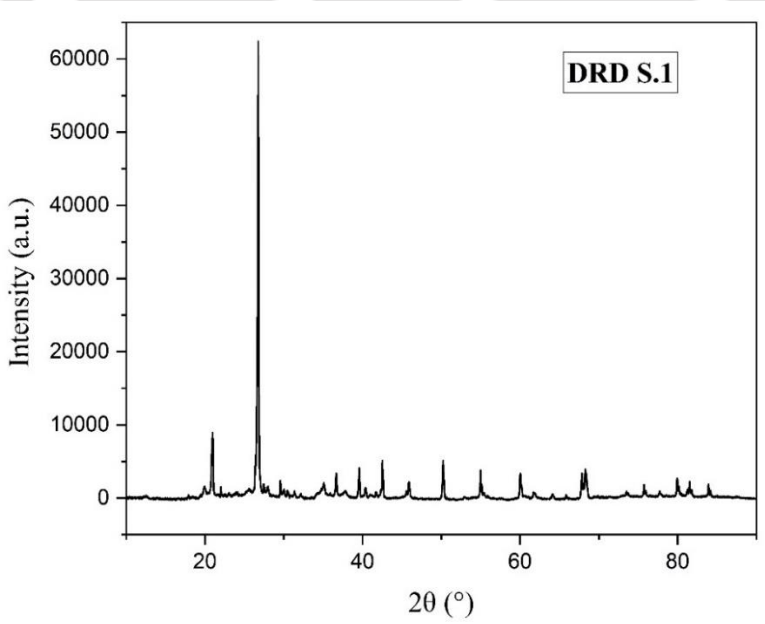


Graph 3. XRD graph for DRD P.3

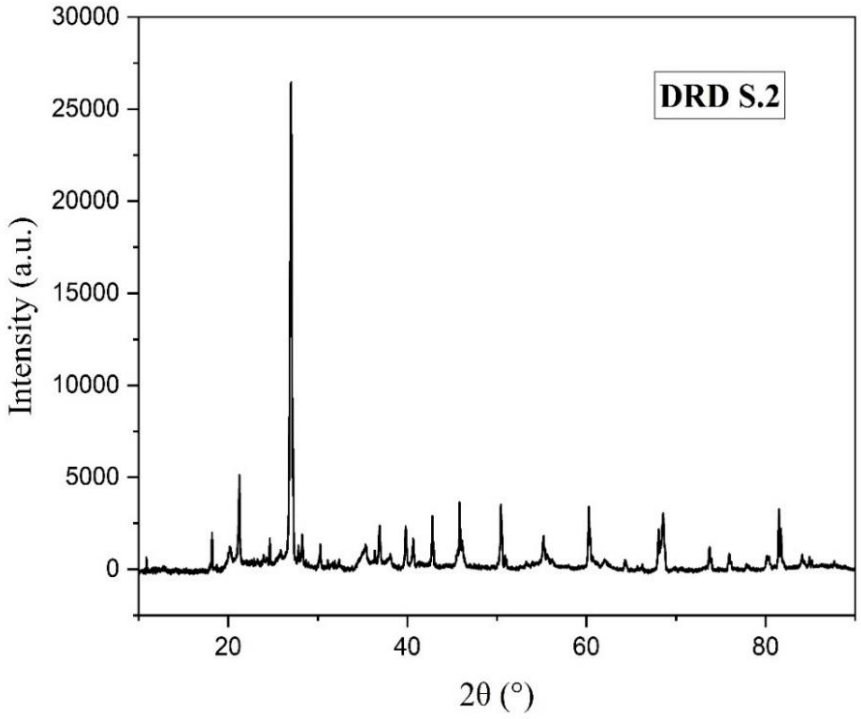


Graph 4. XRD Graph for DRD P.4 BP

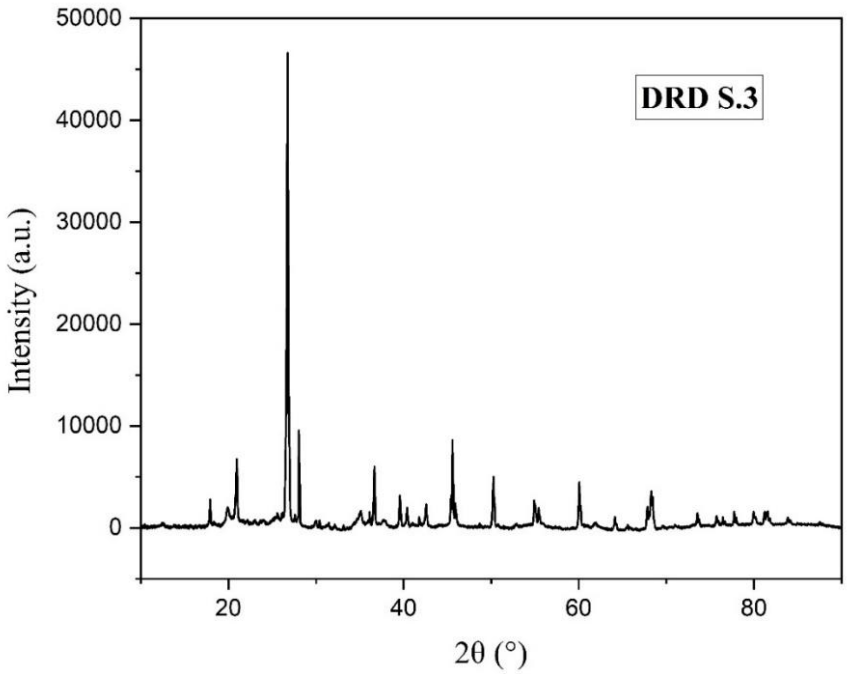
XRD Graph for Soil samples from Daramdin (DRD S.2) are given below.



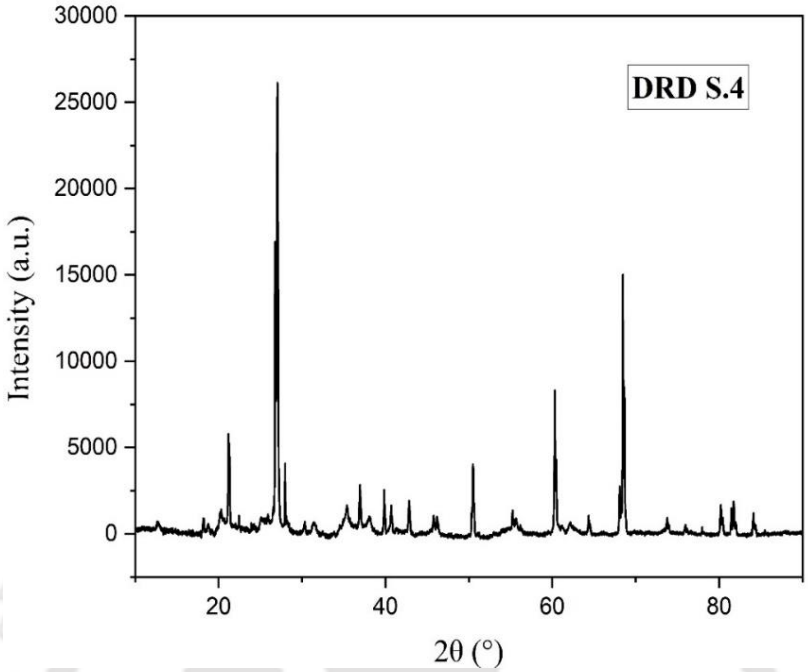
Graph 5. XRD graph for DRD S.1



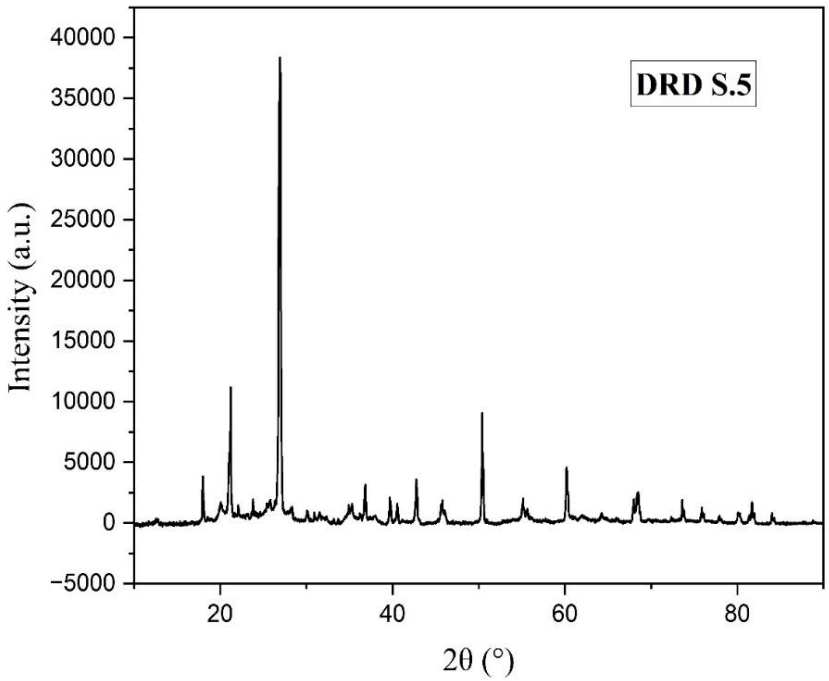
Graph 6. XRD graph for DRD S.2



Graph 7. XRD graph for DRD S.3



Graph 8. XRD graph for DRD S.4



Graph 9. XRD graph for DRD S.5

The XRD data shows that Quartz (SiO_2) abound in the composition of the pottery sample. However, along with quartz, there are other minerals like Goethite ($FeO(OH)$), Hematite (Fe_2O_3), Illite ($K_{0.65}Al_{2.0}[Al_{0.65}Si_{3.35}O_{10}](OH)_2$), Microcline ($KAlSi_3O_8$), Kaolinite ($Al_2Si_2O_5(OH)_4$), and Graphite (C) found in trace amount. Goethite gets transformed to Hematite at 300°C (Song, Jia, & Peng, 2014) which also suggests that that the pottery was fired in oxidizing atmosphere (Dey, Carter, & Swift, 2020). Moreover, Microcline is stable below the temperature of 500°C (Haldar & Tišljar, 2014) and its presence in the pottery samples indicate the firing temperature to be well below 500°C.

5.2.c. Fourier Transform Infrared Spectroscopy (FTIR)

Fourier Transform Infrared Spectroscopy (FTIR) is a characterization technique which studies the composition of the ceramics – organic and inorganic by classifying clay and clay minerals thus, aiding in provenance studies and studies regarding technology, skills and style of the artisans pertaining to firing conditions and firing temperature (Bayazit, et. al., 2013; Velraj, Tamilarasu, & Ramya, 2015; Dey, Carter, & Swift, 2020; Sathya & Velraj, 2011; Barone, et al., 2011; Medeghini, et.al., 2016). The minerals present in a sample are proof of the formation and decomposition of certain minerals and its various phases where the physical, chemical and mineralogical components in ceramics significantly change with the changing temperature (Bayazit, et. al., 2013). One distinctive characteristic of a molecule is its vibrational spectrum. This infrared spectrum is therefore used to identify and compare unknown spectra with the previously known spectra (Velraj, Seetha and Hemamalini 2014; Keller and Pickett 1950). The estimation of the firing range and temperature of pottery is based on the fact that once the clay is fired at a fixed temperature and then cooled down, the property of the clay will not be altered unless the clay is subsequently re-fired at a temperature higher than the initial firing temperature (Ravisankar, et al.,

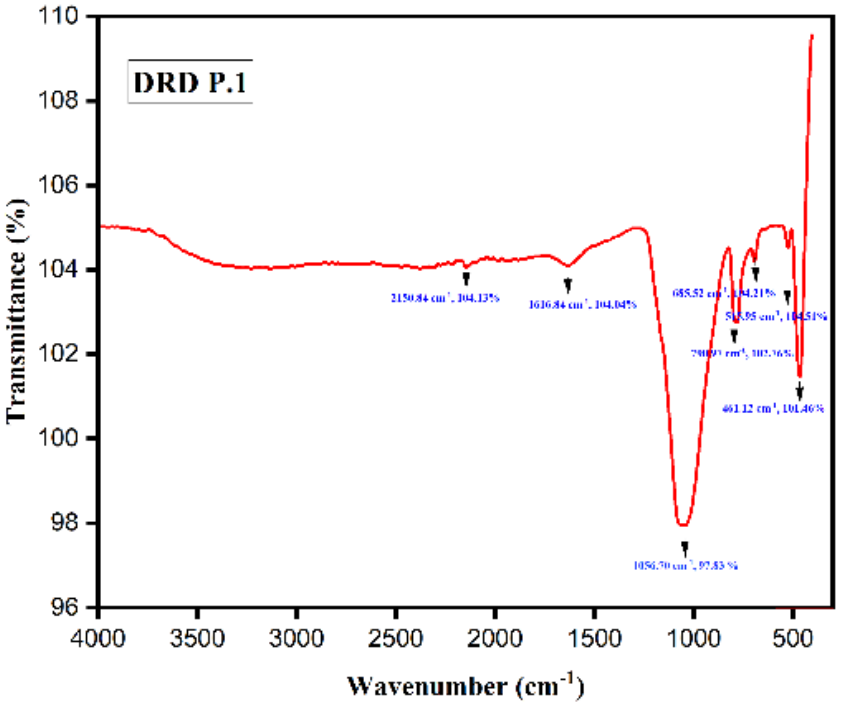
2010; Singh and Sharma, 2016; Palanivel and Kumar, 2011). The knowledge about firing processes in ceramic production helps to better understand the technological progress of a culture at a given time and space. Additionally, it also gives an idea on the techniques of conservation and restoration of ceramics (Palanivel and Kumar, 2011).

The Experiment

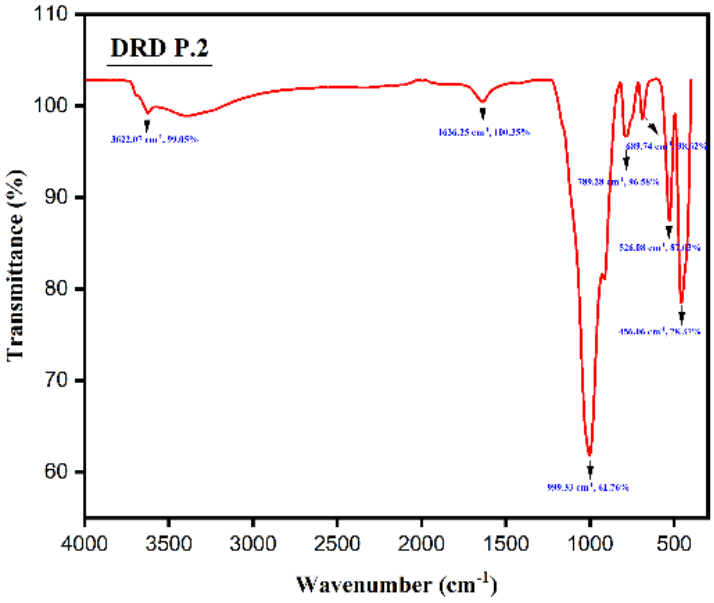
The infrared spectra were recorded for four pottery samples pressed in KBr pellet using Perkin Elmer Spectrum One FTIR Spectrometer in the mid IR region 400-4000 cm^{-1}. Before subjecting the pottery samples to the Spectrometer it was crushed using agate mortar and pestle to reduce it to powdered form. The samples were mixed with KBr in the proportion 1:20 and the spectra were analysed in transmittance mode.

Results

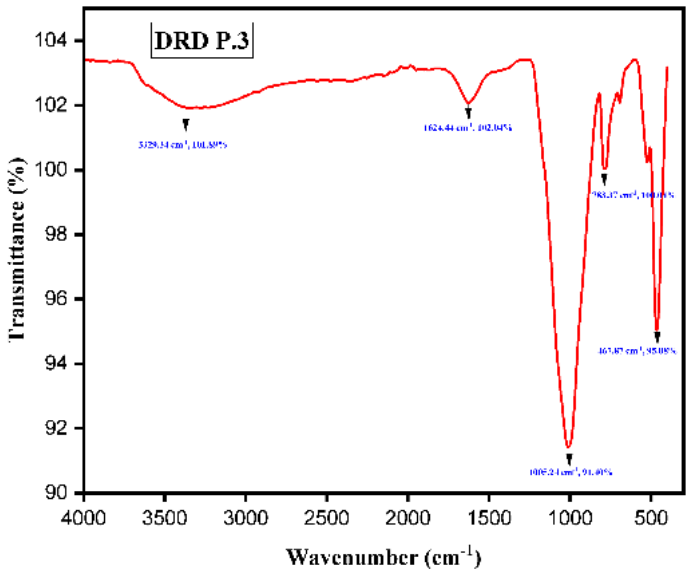
The IR spectrum of DRD P.1, DRD P.2, DRD P.3 and DRD. BP are shown in Figure 1, 2, 3 and 4 respectively.



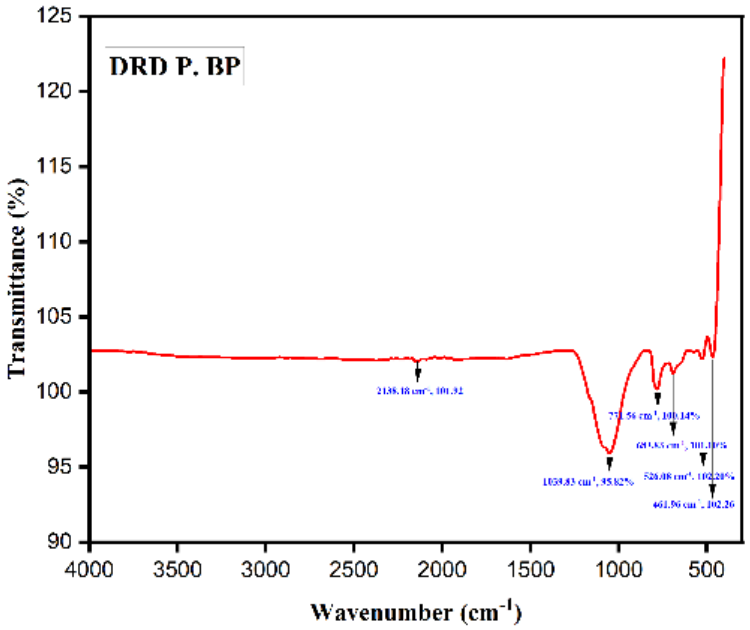
Graph 10. FTIR spectra for DRD P.1



Graph 11. FTIR Spectra for DRD P.2



Graph 12. FTIR spectra for DRD P.3



Graph 13. FTIR spectra for DRD P.4 BP

DRD P.1	DRD P.2	DRD P.3	DRD P.BP	Tentative vibrational assignments
-	3622	3329	-	O-H stretching of absorbed water molecule
2150	-	-	2138	O-H stretching of absorbed water molecule
1616	1636	1624	-	H-O-H bending of water
1056	999	1005	1039	Si-O-Si stretch of Kaolin
790	789	783	771	Si-O of Quartz
685	689	-	683	Si-O of Quartz
515	526	-	526	Fe-O of Hematite
461	456	467	461	Si-O-Si of Microcline

Table 7. The vibrational assignments of FTIR spectra of pottery samples

The FTIR spectra at 3622 and 3329 in DRD P.2 and DRD P.3 respectively indicate the O-H stretching of absorbed water molecule (Saikia and Parthasarathy, 2010; Triki, et al., 2016) or re-hydroxylation of the amorphous material as a result of the decomposition of minerals present in the clay which is fired at a low temperature (Annamalai, et al., 2014; Daghmehchi, et al., 2018). A bend around 1616 cm^{-1}, 1636 cm^{-1} and 1624 cm^{-1} is attributed to H-O-H bending of water which is present in all re-fired pottery due to the absorption of moisture from the atmosphere (Palanivel and Kumar, 2011; Tamilarasu, Anbarasan and Velraj, 2017). A strong band around 1056 cm^{-1}, 999 cm^{-1}, 1005 cm^{-1} and 1039 cm^{-1} for the above mentioned samples indicate Si-O stretching of

kaolinite (Velraj, Tamilarasu and Ramya, 2015; Velraj, Seetha and Hemamalini, 2014) and suggest red clay origin (Ghosh, 1978; Singh and Sharma, 2016; Palanivel and Kumar, 2011). Maria Dagmehchi et.al. (2018) mentions that the band at 1034 cm^{-1} is related to di-octahedral mica which is illite and met clays that is smectite. A medium band around 770-790 cm^{-1} indicate the presence of Quartz (Sathya & Velraj, 2011; Daghmehchi, et.al., 2018; Shoval & Paz, 2015; Singh & Sharma, 2016). A weak band at 685 cm^{-1}, 689 cm^{-1} and 683 cm^{-1} for DRD P.1, DRD P.2 and DRD BP respectively also indicate the presence of Quartz (Palanivel and Kumar, 2011) (Singh and Sharma, 2016). The band around 526 cm^{-1} indicate the presence of Hematite (Sathya & Velraj, 2011; Velraj, Tamilarasu, & Ramya, 2015; Dey, Carter, & Swift, 2020; Bayazit, et.al., 2013; Tamilarasu, Anbarasan, & Velraj, 2017; Singh & Sharma, 2016). This is important in the light of the fact that the presence of hematite is a significant determinant of firing temperature as well as firing condition resulting in the red colour of the pottery (Singh and Sharma, 2016). The presence of hematite is suggestive of the fact that the pottery was fired at an oxidizing atmosphere using open kilns (Velraj, Tamilarasu, & Ramya, 2015; Velraj, Seetha , & Hemamalini, 2014; Dey, Carter, & Swift, 2020). The strong bands around 461 cm^{-1} is alluded to Si-O-Si bending of microcline (Velraj, Tamilarasu and Ramya, 2015; Singh and Sharma, 2016). However, Bayazit et.al. (2013) mentions that the bands around 456 cm^{-1} is suggestive of the presence of illite/muscovite.

The presence of illite/muscovite in the samples propose that the firing temperature may not be more than 600º C-850º C (Bayazit, et al. 2013). However, Daghmehchi et.al (2018) suggested that the strong band around 1039 cm^{-1} which is related to di-octahedral mica (illite) indicated that the firing temperature may be above 600º C -700º C. Iron oxide generally form between the temperature range of 700º C -900º C and is capable of divulging significant information regarding the firing technique of the pottery. The presence of hematite in DRD P.1, DRD P.2 and DRD BP

might suggest that the pottery sherds were fired in open kilns in an oxidizing condition. Magnetite is converted from Hematite at a temperature of 800º C -850º C in reduced condition that is, when the pottery is fired in closed kilns where there is a lack of oxygen (Palanivel and Kumar 2011, Dey, Carter and Swift 2020).

Since there is no presence of magnetite in the samples, it can be suggested that the pottery was probably fired below 800º C in an oxidizing condition. And it is also suggested that the firing temperature could above 600º C -700º C on account of the presence of illite represented by the band at 1039 cm^{-1}, it can be stipulated that the potsherds were fired at a temperature ranging between 700º C -800º C.

5.2.d. Soil pH

The measurement of Soil pH gives a definition of archaeological features enabling the archaeologist to understand the nature of the soil and stratigraphic variation, which is not otherwise visible to the naked eye (Deetz and Dethlefsen, 1963, pp. 242-243). The idea is that traces of past anthropogenic interaction with the natural environment remain in the soil, affecting its dynamics distinctively. For instance, generally, areas where humans occupy, show a more significant amount of phosphorous than those in unoccupied areas. Acidic soils are common in humid regions, and its effect is seen in the density and pattern of vegetation (McCawley and McKerrell, 1974; Tan, 2011).

The soil from Daramdin belongs to Mangjin- Daramdin soil series and comprise silt loam and loam (National Bureau of Soil Survey & Land Use Planning, 2005). The soil erosion in the region is moderate, and the soil reaction is described as extremely acidic to strongly acidic (National Bureau of Soil Survey & Land Use Planning, 2005). However, the litmus test conducted by the authors corresponded to pH 5, which is moderately acidic. The method used for the litmus test is

soil suspension, where the soil sample is mixed with water in the ratio of 1:2 and stirred to mix well. The litmus paper is then suspended in the mixture, and the colour change is noted. Soil with a pH less than 6 is likely to be lacking in micronutrients such as Calcium (Ca), Magnesium (Mg) and Potassium (K) (Tan, 2011, pp. 249-250). Soluble aluminium is found in a substantial quantity in soils of acidic nature. Congruous to this, the EDX result for soil samples also indicates that Ca, Mg and K are present in the samples in negligible quantities, i.e., less than 1 %. This is also in agreement with the fact that the soil is non-calcareous in nature with the pH 5 since calcareous soil exhibits pH more than 7 and is characterized by the presence of calcium carbonate ($CaCO_3$) which is generally found in semi-arid to arid regions (Taalab, et.al., 2019, p. 97).

The following table (Table 6) shows the litmus test reading of four soil samples from Daramdin collected from different depths.

Sl.No.	Soil name (Depth from the surface)	pH reading	Remarks
1.	DRD S.1 (0-20 cm)	5	Moderately acidic
2.	DRD S.2 (20-50)	5	Moderately acidic
3.	DRD S.3 (50-80)	5	Moderately acidic
4.	DRD S.4 (50-80)	5	Moderately acidic

Table 8. Litmus test of soil samples

5.2.e. Thermogravimetric Analysis - Differential Scanning Calorimetry (TGA -DSC)

The thermal analysis of 4 samples were carried out using Thermo Gravimetric analysis coupled with Differential scanning calorimetry. Thermogravimetric analysis (TGA) helps us understand the change in weight of the sample as the change in temperature occurs. The sample is subjected

to controlled heating. As a result of which various reactions like evaporation, oxidation or decomposition, there is a change in the weight of the sample which is detected by the instrument and represented in a thermogram. Thus, TGA helps in identifying various properties of materials, such as thermal stability, composition, moisture content, and decomposition temperatures.

DSC on the other hand measures the enthalpy change (heat absorbed or released by a sample) as it undergoes physical or chemical changes under controlled temperature changes. Any energy changes, such as endothermic (absorbing heat) or exothermic (releasing heat) processes, occurring within the sample are detected as upward or downward peaks in a graph. This helps us in gaining insights into various properties of materials, such as evaporation point, melting point, decomposition temperature, phase transitions among many others.

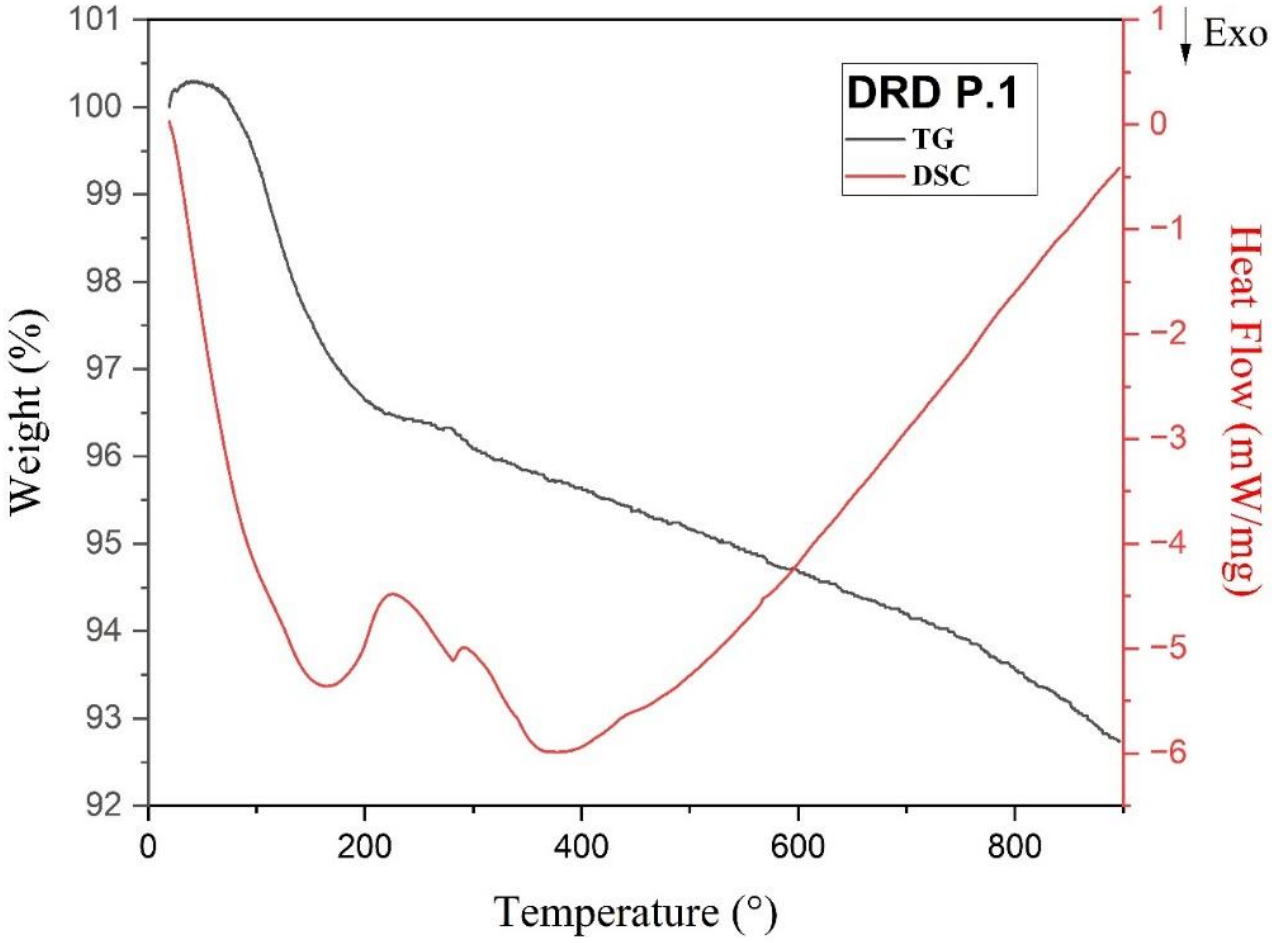
TGA –DSC analysis was carried out using DSC/TGA Analyser manufactured by Netzsch in the model STA449F3A00. The analytical parameters are given in the table below:

Sl. No	Parameters	Specifications
1.	Temperature Range	20ºC - 900ºC
2.	Gas atmosphere	Inert
3.	Purge Gas	Argon
4.	Heating rate	10ºC/min

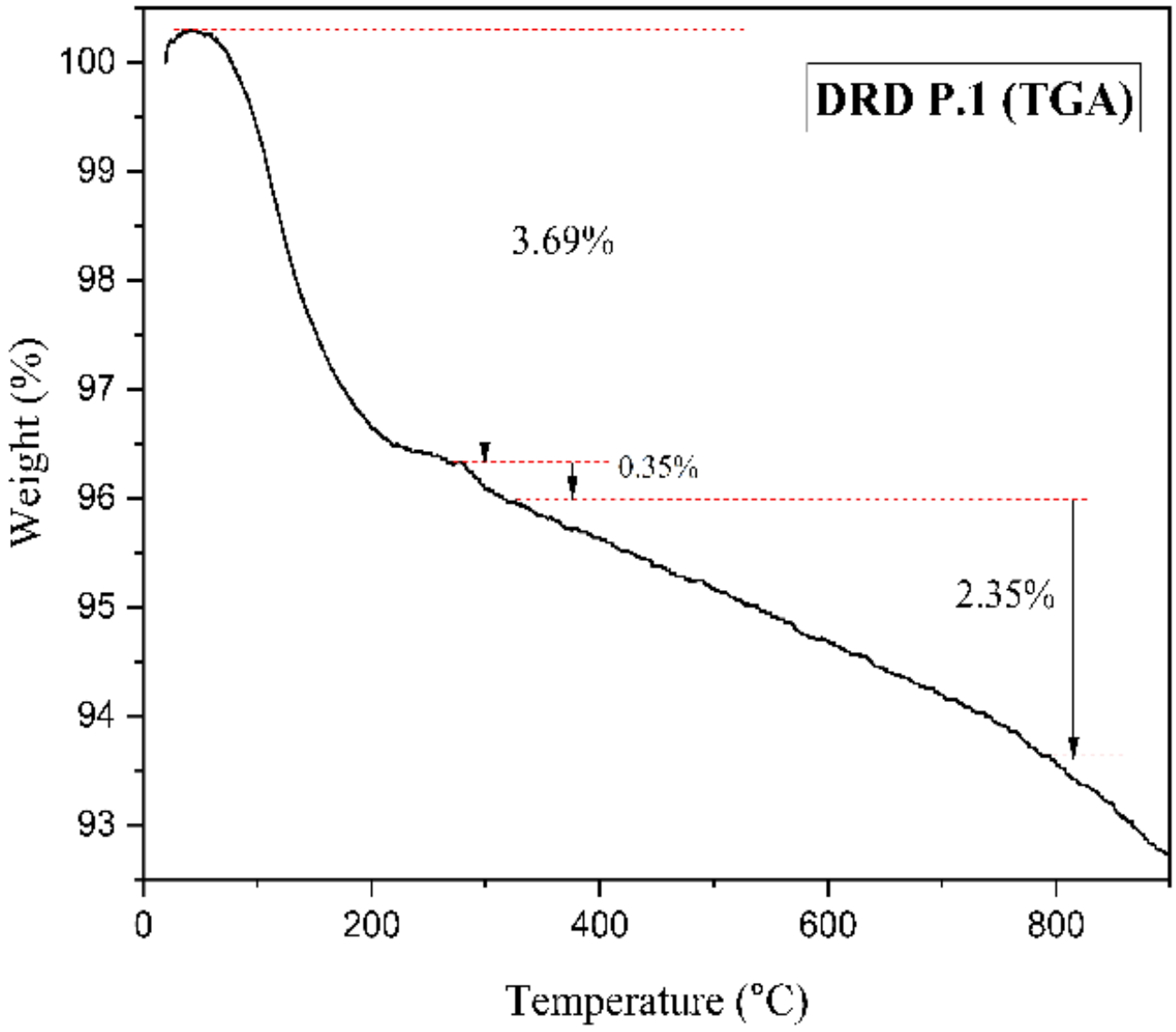
Table 9. The analytical parameters of TGA-DSC

The endothermic and exothermic reaction and their effect on the weight loss of the sample deduces valuable insights on the physical and thermal properties, characterization and the decomposition temperature. The endothermic reaction that takes place ranging from room temperature to 300 ºC is attributed to the loss of hygroscopic water molecules or dehydration present in the samples. The

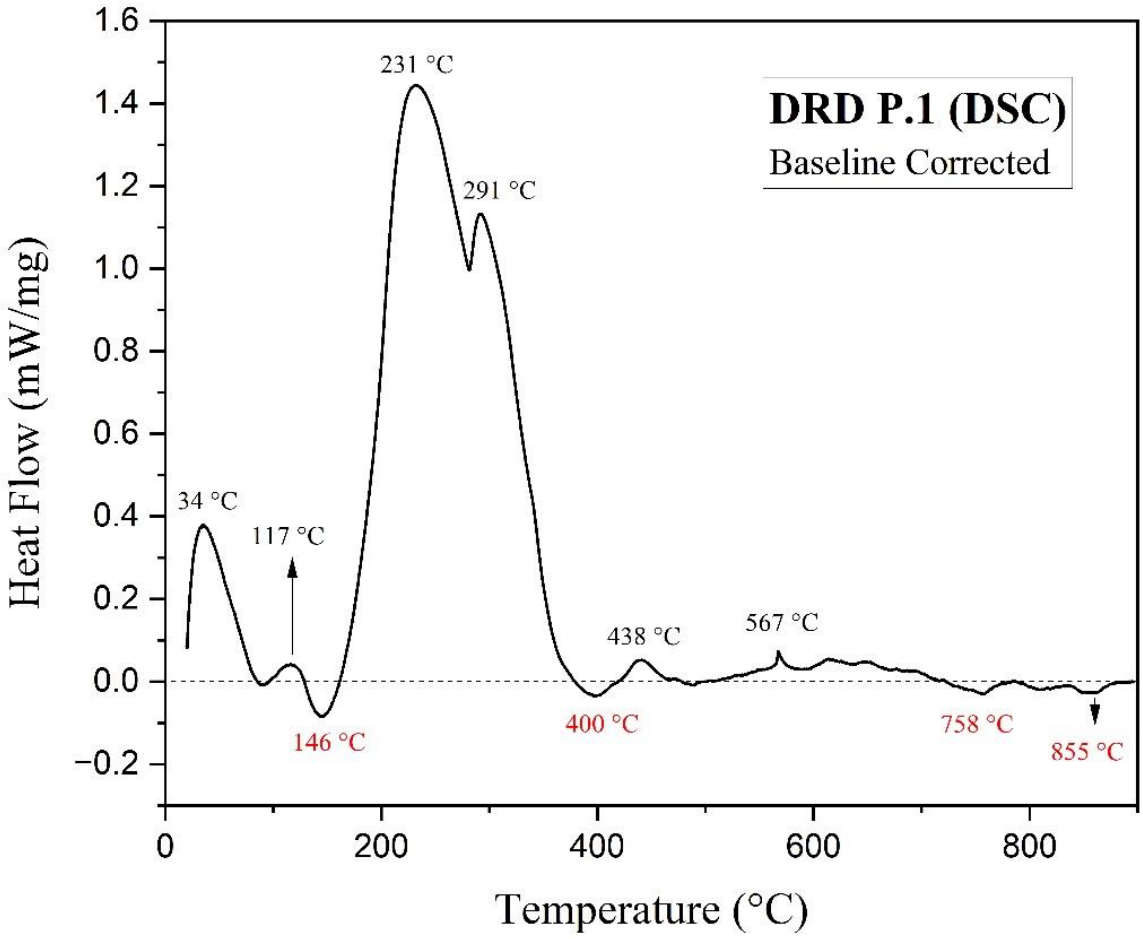
weight loss in this temperature range therefore corresponds to the amount of water molecules present in the samples. The oxidation of organic compounds begins from 250 ºC when the carbon in the organic matter oxidises to carbon monoxide (CO) and carbon dioxide (CO_2) (Singh and Sharma 2016). This process is indicated by exothermic peaks in the range of 250-500 C (Velraj, Seetha and Hemamalini 2014). In an inert atmosphere the combustion of organic matter is characterized by weak endothermic peaks (Labus, 2017). From 400 ºC – 650 ºC the hydroxyls present in the clay minerals start to decompose (Drebushchak, et al., 2005; Chakchouk, et al., 2009). Kaolinite decomposes to form meta-kaolinite within the temperature range of 500 to 650°C (Palanivel and Kumar, 2011). The presence of a dehydroxylation kaolinite peak suggests that the pottery hasn't been fired beyond 650°C which signifies that the kaolinite mineral endured the firing process used by ancient potters (Drebushchak, et al., 2005). A minor endothermic effect occurring approximately at 575°C, peaking at 573°C, is referred to as the 'quartz peak' which is linked to the transition between alpha (α) to beta (β) polymorphs of quartz (Thickett, Odlyha and Ling, 2002; Labus, 2017). From 700 ºC to 850 ºC, the carbonates, especially in the form of calcite gets decomposed and the re-structuring and re-crystallized minerals begin to form. However, after heating the sample up to 860 ºC, the clay minerals get destroyed or recrystallization takes place thereby changing the crystal structure of the minerals (Drebushchak, et al., 2005). The TGA and DSC graphs for the samples are presented as follows:



Graph 14. TG and DSC curve for DRD P.1



Graph 14 (a). TG curve for DRD P.1



Graph 14 (b). DSC curve for DRD P.1

The TGA graph show weight loss percent as against the incremental change in the temperature whereas the DSC graph shows the enthalpy reactions/changes with the heat flow as a function of temperature.

The tabulated form of the TGA and DSC graphs for sample DRD P.1 is given below.

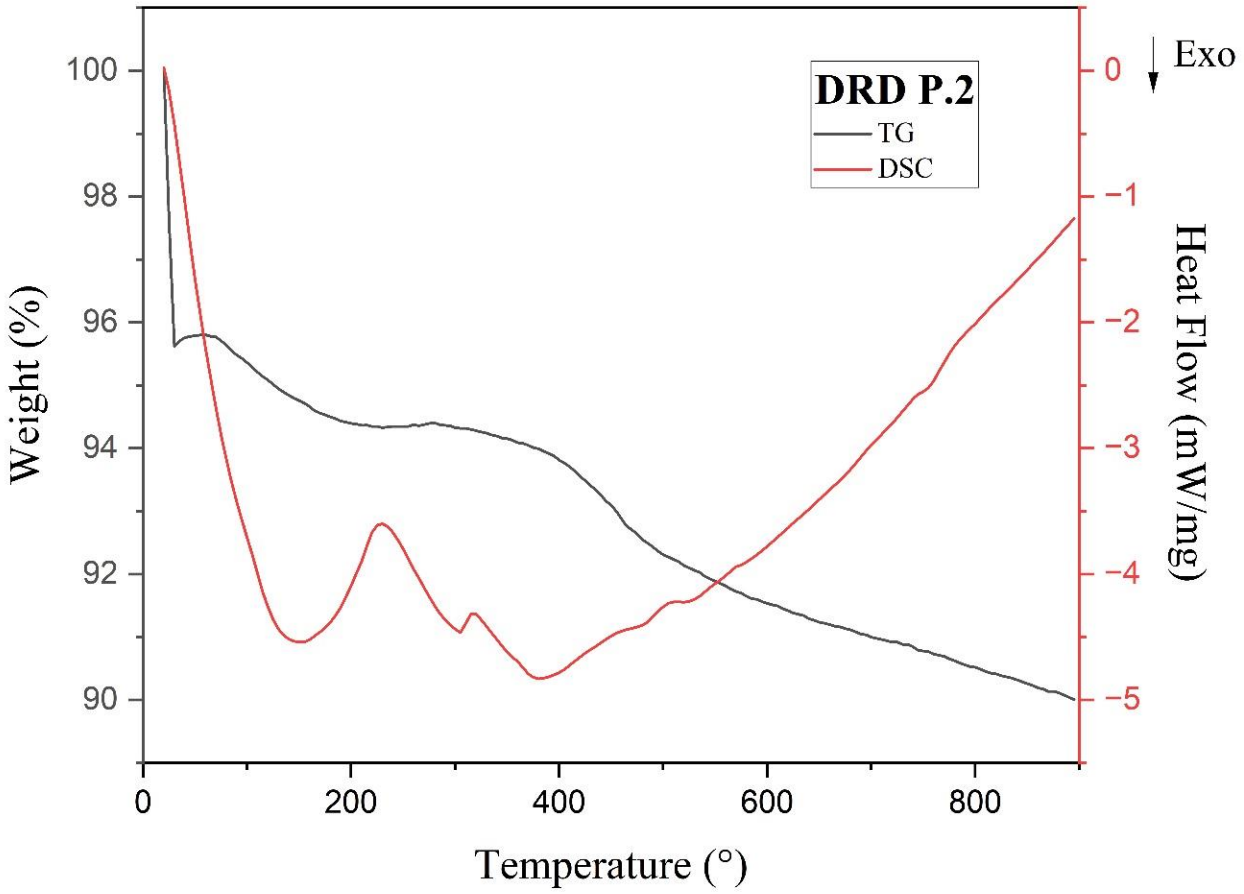
Sl. No.	Temperature Range (°C)	Weight loss (%)
1.	42-272	3.69
2.	272-322	0.35
3.	322-791	2.35

Table 10. The weight loss percent against the incremental change in temperature as shown in TGA graph for DRD P.1

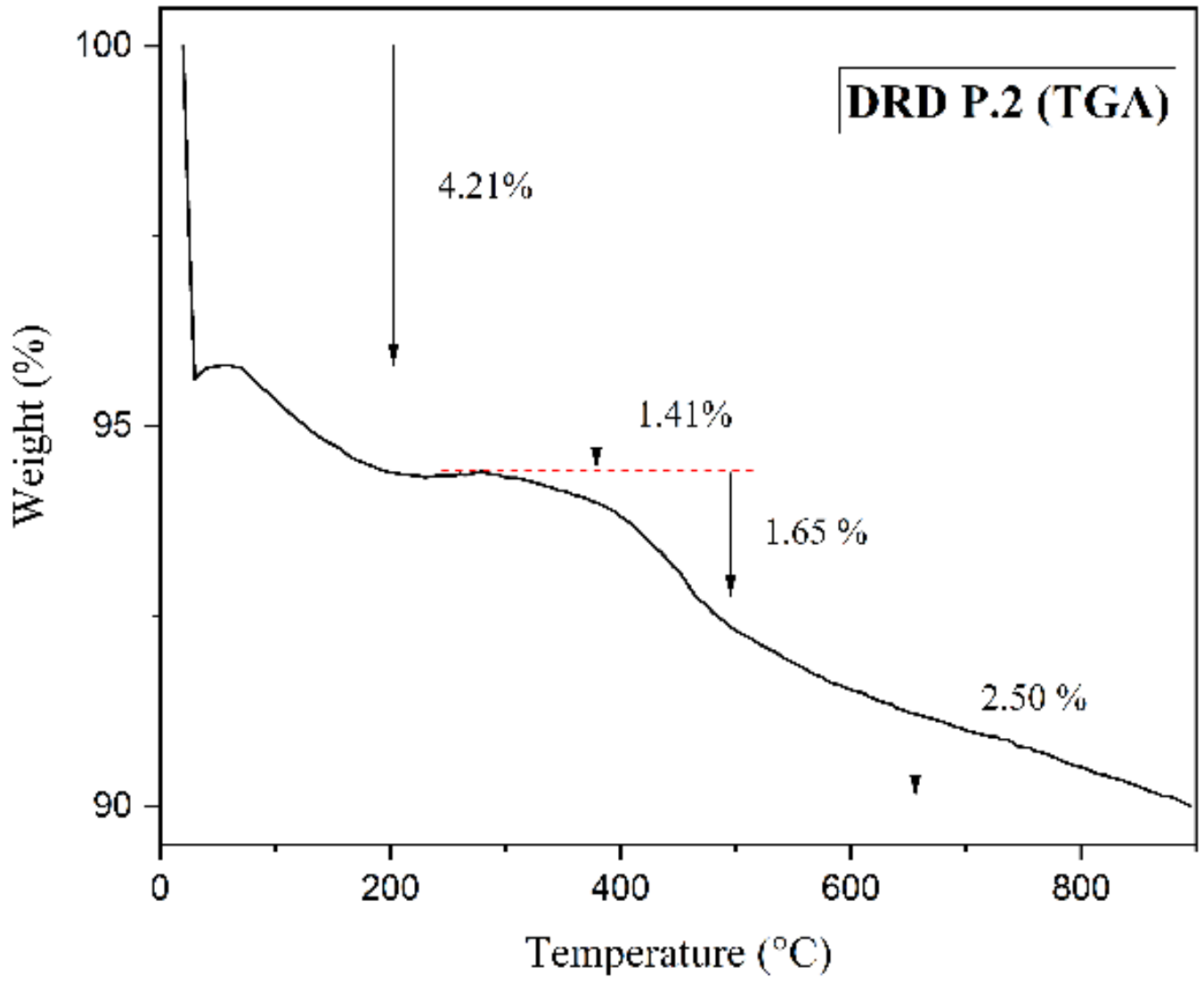
Sl. No.	Temperature (°C)	Reaction	Remarks
1.	34	Endothermic	Dehydration
2.	117	Endothermic	Dehydration
3.	146	Exothermic	Dehydration
4.	231	Endothermic	Dehydration
5.	291	Endothermic	Dehydroxylation/combustion of organic matter
6.	400	Exothermic	Combustion of organic matter
7.	438	Endothermic	Dehydroxylation/combustion of organic matter
8.	567	Endothermic	Quartz Peak
9.	758	Exothermic	Dehydroxylation
10.	855	Exothermic	Destruction of clay minerals

Table 11. Enthalpy reaction as depicted in DSC graph for DRD P.1

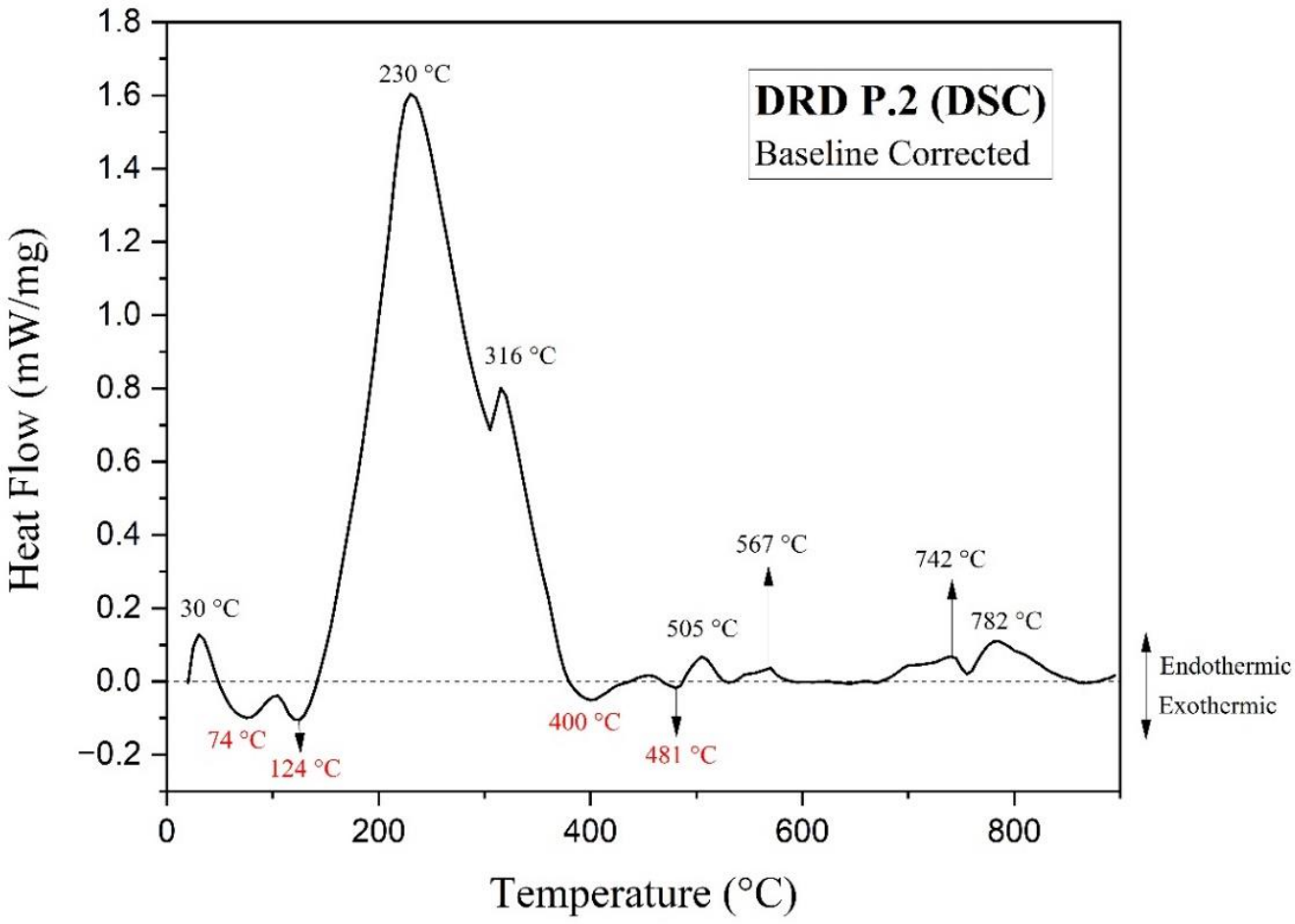
In sample DRD P.1 a sharp weight loss is seen in the endothermic reaction peaking at 34ºC through 291 ºC which is attributed to be because of evaporation leading to dehydration. The weak endo thermic peaks at 438 ºC correspond to either dehydroxylation or combustion of organic matter in the samples. A small sharp peak at 567 ºC is in fact the quartz peak indicating a polymorph transition of quartz. It is also noted that there are no endothermic peaks after the quartz peak which is also indicated in the TGA graph where 2.50% of weight loss occurred over an expanse of 400 ºC as compared to 3.69% of weight loss within an expanse of 300 ºC. Furthermore, since around 860 ºC the clay minerals are getting destroyed, the exothermic peak at 855 ºC possibly indicates the beginning of recrystallization of minerals due to desorption of heat. The absence of endothermic peaks to indicate the decomposition of calcites is in agreement with EDX/EDS data where DRD P.1 marks the absence of element calcium (Ca). therefore, the absence of Calcite is suggestive of the firing temperature being below 600 ºC.



Graph 15. TG, and DSC curves for DRD P. 2



Graph 15(a). TG curve for DRD P.2



Graph 15(b). DSC curve for DRD P.2

The tabulated form of the graphs above are given below.

Sl. No.	Temperature Range (°C)	Weight loss (%)
1.	20-55	4.21
2.	55-271	1.41
3.	271-468	1.65

4.	468-872	2.50

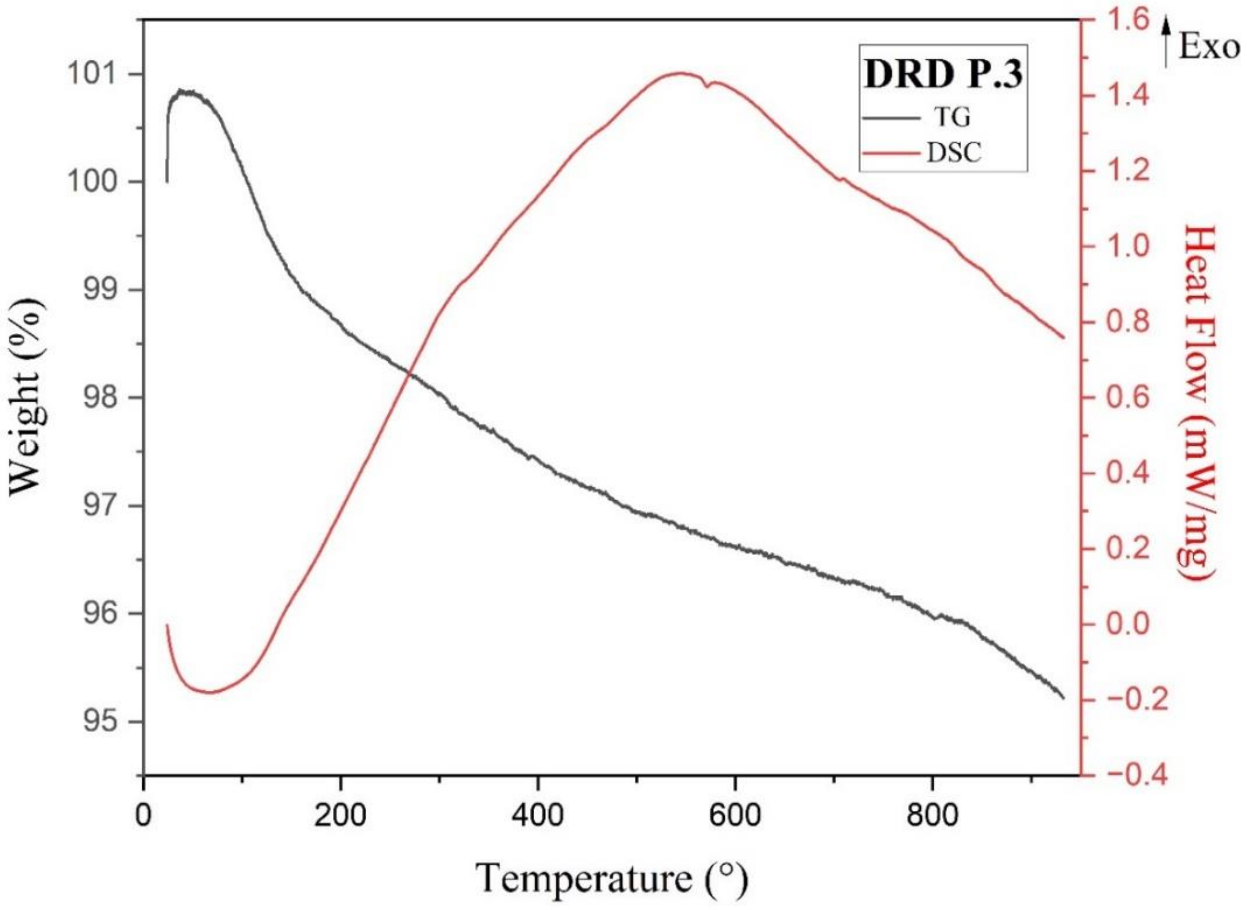
Table 12. Weight loss against the corresponding temperature range as shown in TGA graph for DRD P.2

Sl. No.	Temperature (ºC)	Reaction	Remarks
1.	30	Endothermic	Dehydration
2.	74	Exothermic	Dehydration
5.	124	Exothermic	Dehydration
6.	230	Endothermic	Dehydration
7.	316	Endothermic	Dehydroxylation/combustion of organic matter
8.	400	Exothermic	Combustion of organic matter
9.	481	Exothermic	Combustion of organic matter
10.	505	Endothermic	Decomposition of Kaolinite into meta Kaolinite
12.	567	Endothermic	Quartz Peak
15.	742	Endothermic	Dehydroxylation
16.	782	Endothermic	Dehydroxylation

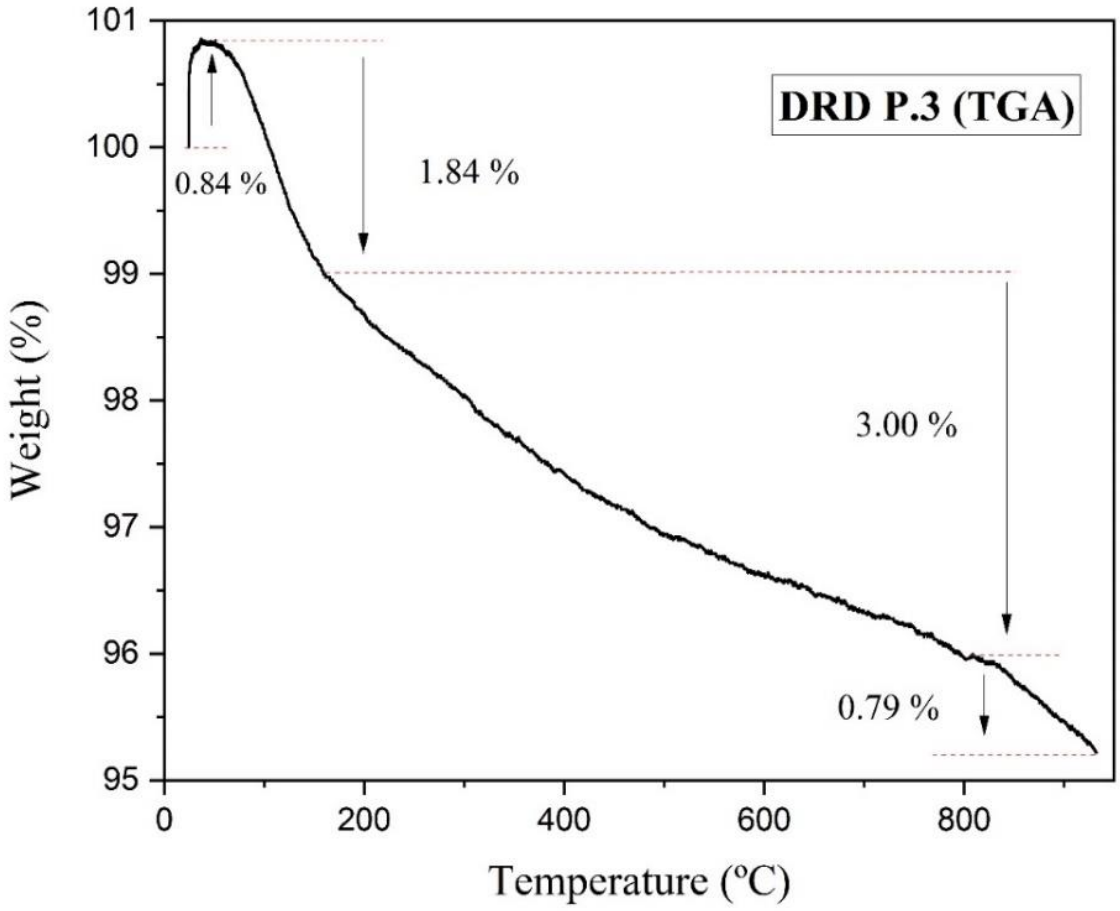
Table 13. Enthalpy reaction as depicted in DSC graph for DRD P.2

In sample DRD P.2, the dehydration of water molecules starts from 30 ºC and continues till 230 ºC and shows a significant weight loss of 4.21 % as indicated by TGA curve. The endothermic peaks at 316 ºC and 505 ºC indicate the loss of hydroxyls or combustion of organic matter present

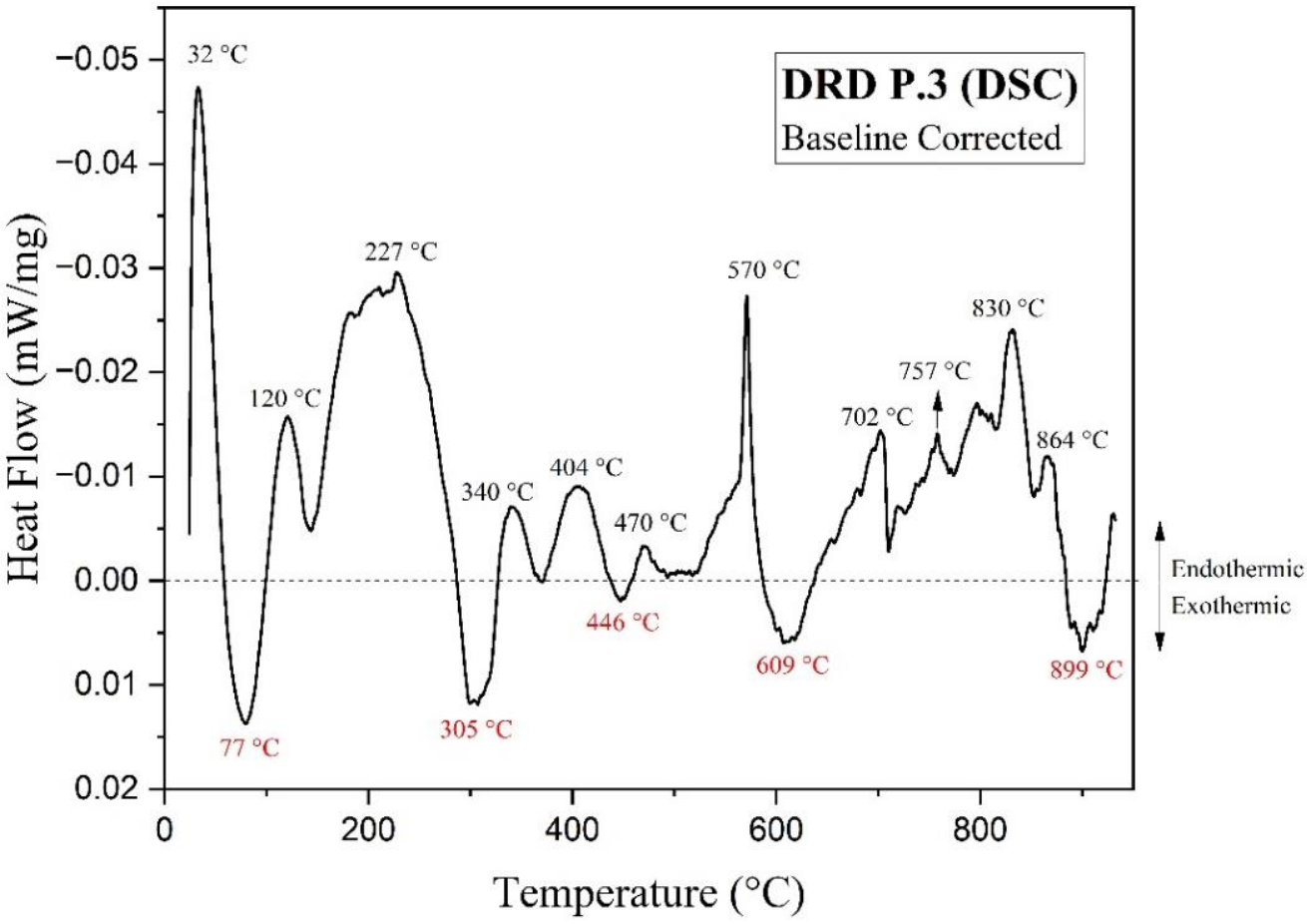
in the sample. The peak at 505 ºC in all possibility refers to the decomposition of kaolinite into meta kaolinite. The peak at 567 ºC indicate the quartz peak. The peaks between 700 ºC - 850 ºC generally refer to the decomposition of calcite alone but since the sample does not contain calcium or carbon as suggested by EDS/EDX, the endothermic peaks at 742 ºC and 782 ºC refers to the dehydroxylation of kaolinitic clay (Deju et.al, 2021, p. 1)



Graph 16. TG, and DSC curve for DRD P. 3



Graph 16 (a). TG curve for DRD P.3



Graph 16 (b). DSC curve for DRD P.3

The tabulated form of the graphs above are given below.

Sl. No.	Temperature range (ºC)	Weight Loss (%)
1.	37-147	1.73
2.	147-809	3.10
3.	809-934	0.78

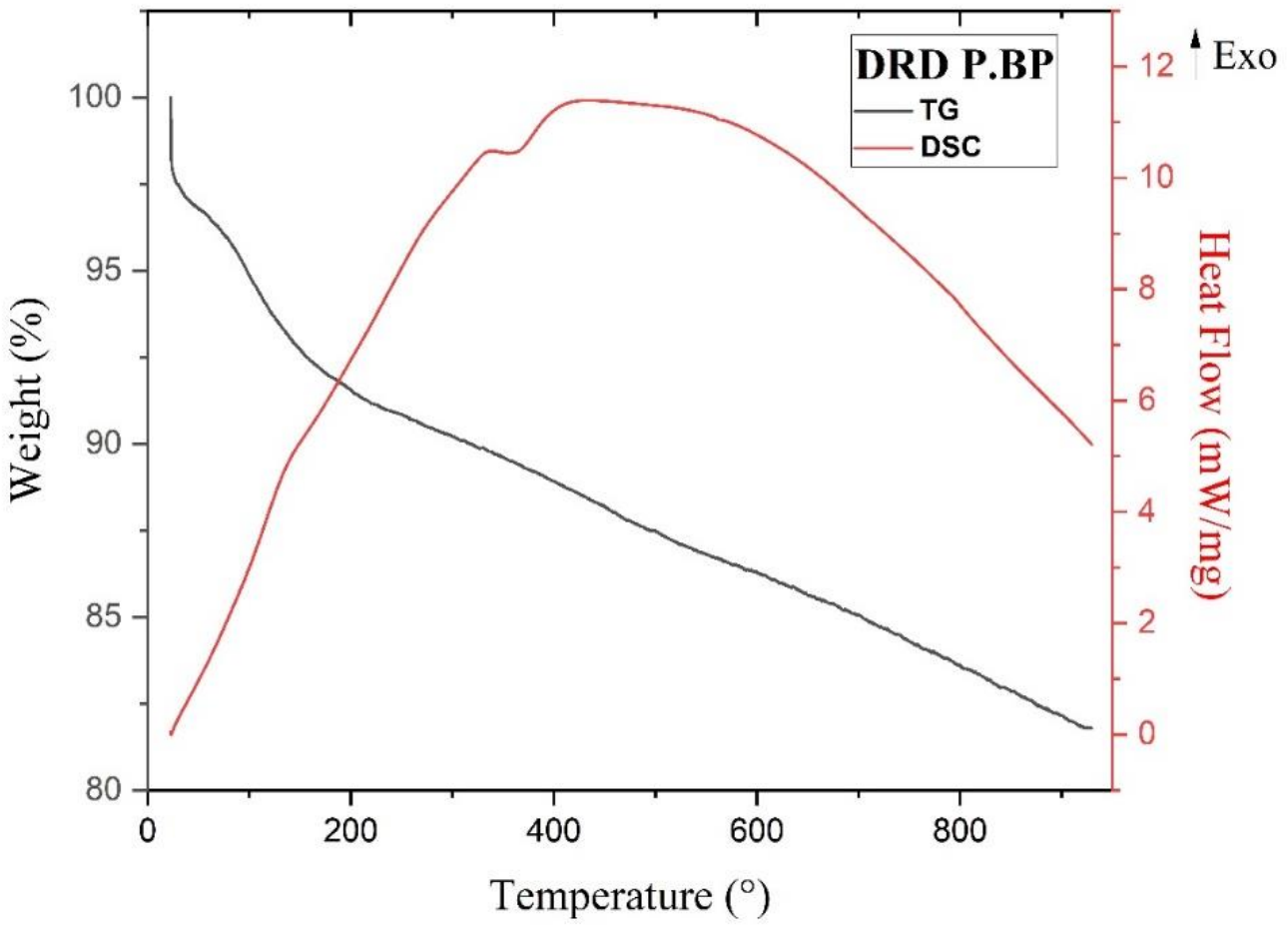
Table 14. Weight loss against the corresponding temperature range as shown in TGA graph for DRD P.3

Sl. No.	Temperature (ºC)	Reaction	Remarks
1.	32	Endothermic	Dehydration
2.	77	Exothermic	Dehydration
3.	120	Endothermic	Dehydration
4.	227	Endothermic	Dehydration
5.	305	Exothermic	Dehydroxylation/combustion of organic matter
6.	340	Endothermic	Dehydroxylation/Combustion of organic matter
7.	404	Endothermic	Dehydroxylation/Combustion of organic matter
8.	446	Exothermic	Combustion of organic matter
9.	470	Endothermic	Dehydroxylation/Combustion of organic matter
10.	570	Endothermic	Quartz Peak
11.	609	Exothermic	Decomposition of Kaolinite to meta Kaolinite
12.	702	Endothermic	Dehydroxylation
13.	757	Endothermic	Dehydroxylation

14.	830	Endothermic	Destruction of clay minerals
15.	864	Endothermic	Destruction of clay minerals
16.	899	Exothermic	Destruction of clay minerals

Table 15. The enthalpy reaction as depicted in DSC graph for DRD P.3

In DRD P.3, the dehydration of water molecules starts from 30 ºC and continues till 227 ºC. This shows a considerable weight loss of 1.73 % of the total weight of the sample as shown in the TGA curve. The peaks at 340 ºC, 404 ºC, 446 ºC and 470 ºC indicate either dehydroxylation or combustion of organic matter. The peak at 570 ºC is the Quartz peak and the exothermic peak at 609 ºC suggest the decomposition of Kaolinite. The weight loss in this temperature range of 150 ºC to 800 ºC is 3.10% of the total weight of the sample and is consistent a shown by the TGA curve, The peaks at 864 ºC and 899 ºC possibly demonstrate desorption of heat to recrystallize the minerals.



Graph 17. TG, and DSC curves for DRD P. 4 BP

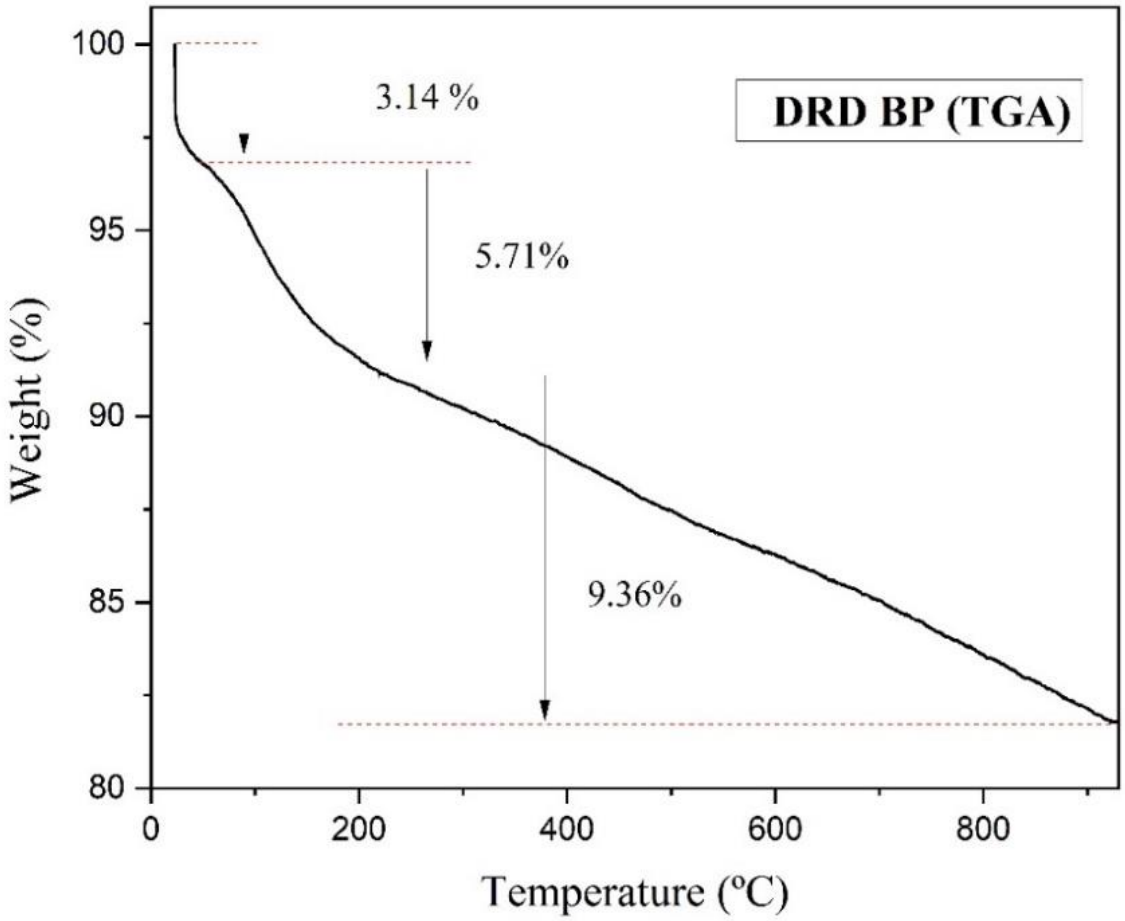


Figure 17(a). TG curve for DRD P.4 BP

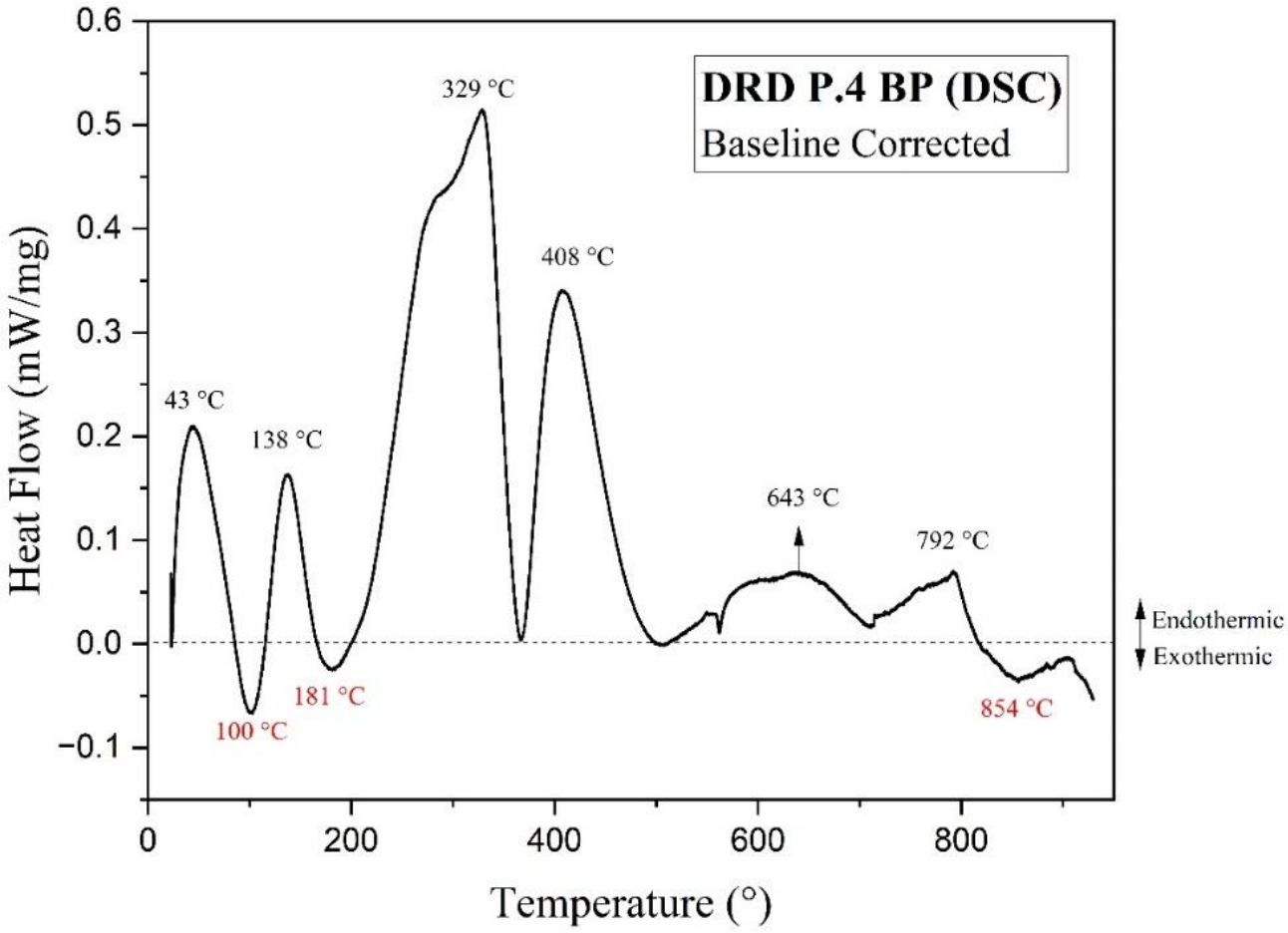


Figure 17(b). DSC curve for DRD P.4 BP

Sl. No.	Temperature Range (ºC)	Weight Loss (%)
1.	22 - 29	3.14
2.	29 - 242	5.71
3.	242 - 924	9.36

Table 16 . Weight loss against the corresponding temperature range as shown in TGA graph for DRD P.4 BP

Sl. No	Temperature (ºC)	Reaction	Remarks
1.	43	Endothermic	Dehydration
2.	100	Exothermic	Dehydration
3.	181	Exothermic	Dehydration
4.	329	Endothermic	Dehydration
5.	408	Endothermic	Dehydroxylation/combustion of organic matter
6.	643	Endothermic	Decomposition of Kaolinite to meta kaolinite
7.	792	Endothermic	Destruction of clay minerals
8.	854	Exothermic	Destruction of clay minerals

Table 17. The enthalpy reaction as depicted in DSC graph for DRD P.4 BP

In DRD P.4 BP, which is a black colored pottery sherd, the dehydration or loss of hygroscopic water is seen from the temperature range of 43 ºC to 329 ºC which is also indicated in the TGA curve when the sample loses about 5% of its total weight. The process of dehydroxilation or combustion of organic matter is indicated by a single peak marked at 408 ºC. The endothermic peak at 643 likely indicates the decomposition of kaolinite to meta kaolinite and so its presence is an indication that the sample was fired below 650 ºC. By around 850 ºC, the clay minerals either start getting destroyed or the process of recrystallization begins. Therefore, the exothermic peak at 854 ºC denotes the destruction of clay minerals.

5.2.f. Radiocarbon Dating using Accelerator Mass Spectrometry (AMS)

Accelerator Mass Spectrometry (AMS), which was first applied in Archaeology in 1983 is a preferred and reliable means to date a range of artefacts like charcoal, wood or bones among others. An advantage of using AMS lies is that it is capable of effectively dating samples of minute size as opposed to the traditional method developed by Willard Libby in 1949 which needed a sizable amount of samples to be dated (Gowlette, 1987, p. 129). Therefore, to ascertain a temporal framework of the artefacts /samples collected from Daramdin, five charcoal samples from different depths were subjected to Radiocarbon dating using AMS at the Inter University Accelerator Centre, New Delhi.

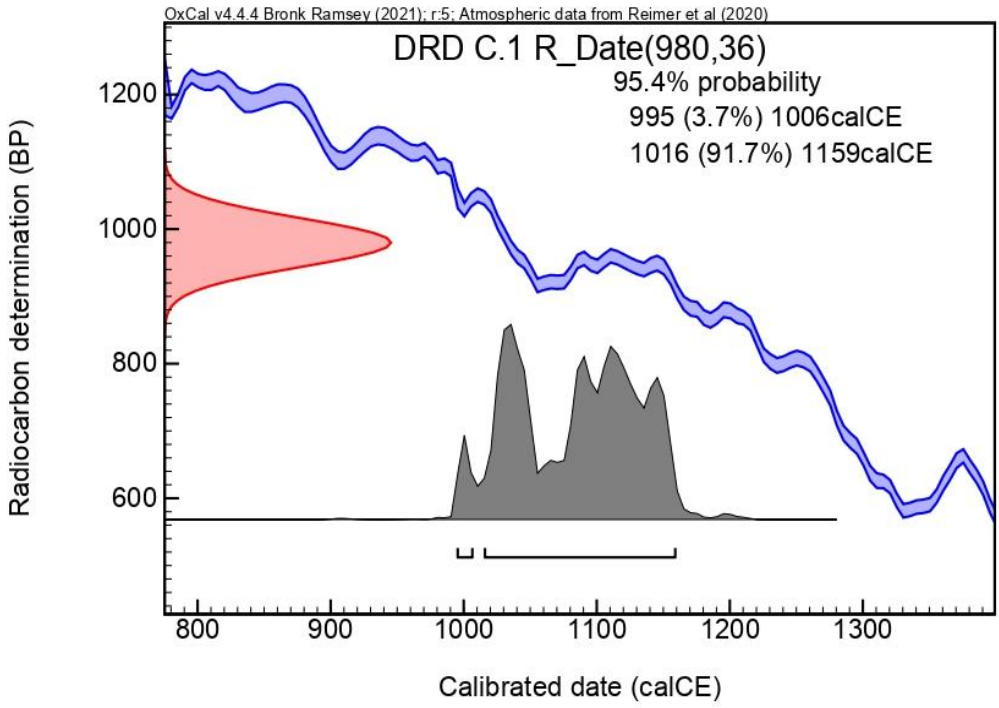
In order to ascertain the time period of the charcoal sample, Accelerator Mass Spectrometry (AMS) dating was conducted at Pelletron Accelerator RBS-AMS Systems (PARAS) in Inter University Accelerator Centre (IUAC), Delhi. 5 samples of charcoal from different depths in the stratigraphy are analysed. The samples are named as follows:

Sample name	Sample code (IUAC)	Depth (cm) (From the surface)
C.1	23C6558	30
C.2	23C6559	42
C.3	23C6560	78
C.4	23C6561	97
C.5	23C6562	100

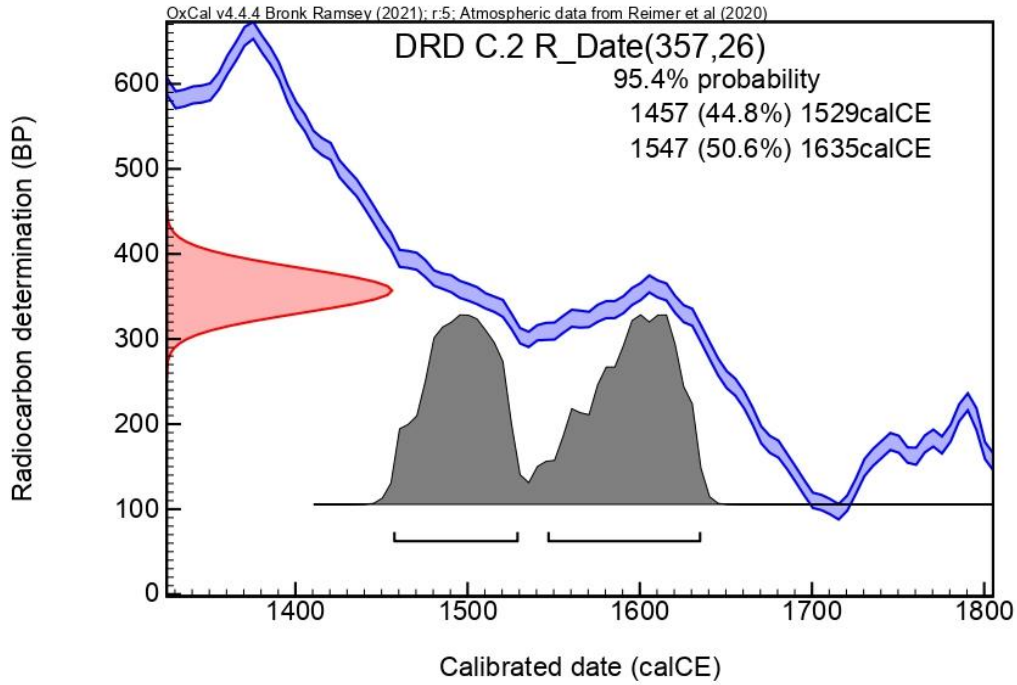
Table 18. Table showing the depth from which the charcoal samples were collected

The charcoal samples are cleaned of any sediments by carefully scraping the surface with tweezers and were put in 15 ml. vials. The samples are pre-treated with Acid-Base-Acid treatment where the samples were washed in 10 ml of 0.5 molar Hydrochloric Acid (HCL) and vortexed in a thermos-shaker at 60º Celsius. The acid in the samples is then washed with Milli-Q water to achieve a pH reading of 7 (neutral). Subsequently, the samples are washed in 0.1 molar of Sodium Hydroxide (NaoH), which is a base, and the same process is repeated with Milli-Q water. Milli-Q water is ultrapure water with no ions. Therefore, washing the sample with Milli-Q water will not have any contaminants in the water. Once again, the samples are washed in 10 ml of Hydrochloric Acid (HCL). The samples were then wrapped in aluminium foil and kept in a deep freezer for five hours. They were were then freeze dried in a Lyophilizer (Allied Frost Lyophilizer - FD -3) over night (16 hours). The temperature was maintained at -85º Celsius. Thereafter, the samples were made into pellets using tin boats and transferred into sample holders with labels. The Graphitization of the samples is done using Elementar Analyser Varioisotope Select. The temperature in the combustion tube was 920º Celsius and the pressure is approximately 1200 mbar. The amount of Oxygen (O) was 12ml/min and Helium (He) was 245ml/min. In this process a reaction between carbon dioxide (CO_2) and hydrogen (H_2) will take place at the temperature of 580º Celsius with iron powder as the catalyst. The resultant compound will be Graphite and Water. With the help of cooling mechanism, the water is turned into ice and emptied out leaving us with Graphite and Iron Powder. Since Iron powder is a catalyst, it will not participate in the reaction. The Graphite and Iron powder is then pressed with Electric Cathode Press. The final step to Pretreatment of the sample is Electric Cathode Press (ECP-890). The Graphitized samples were pressed using Cathode nodule after which the samples are ready to be bombarded with Cesium beams.

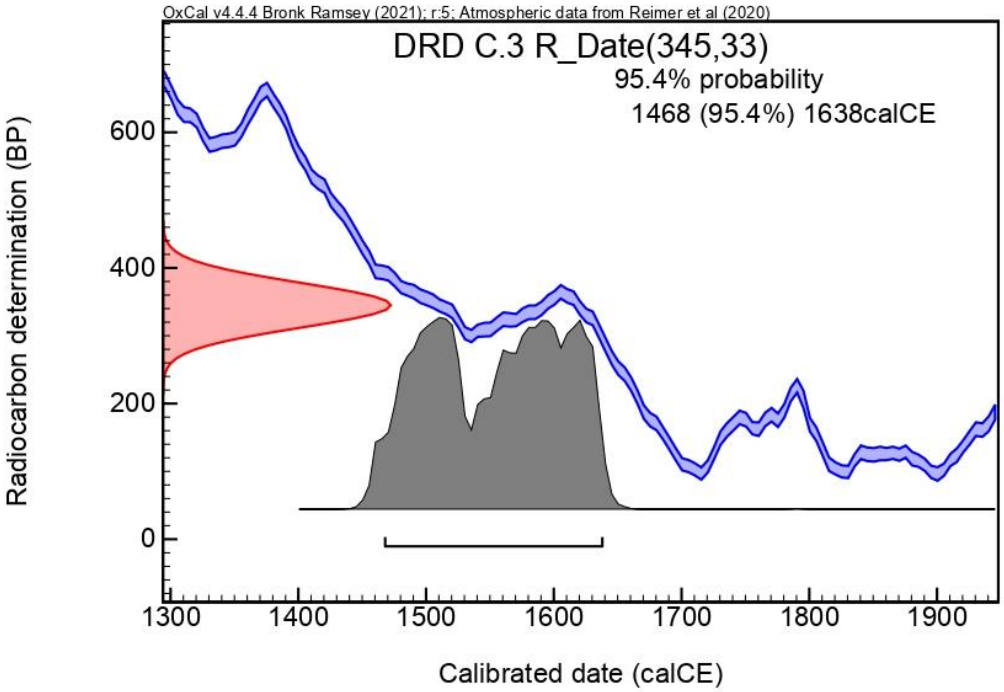
The radiocarbon dates obtained were calibrated using the OxCal 4.4 application, an online tool for refining radiocarbon age estimates. The calibrated dates were taken into account for understanding the context of the findings in the larger historical timeline. The images of the graphs below show us the radiocarbon calibration curves which is used to convert radiocarbon dates (measured in years before present, BP) into calendar dates. The calibration curve is based on atmospheric radiocarbon data from Reimer et al. (2020). The red shaded area in the graph represents the uncalibrated dates which when seen against the calibration curve (represented in blue curve) shows the probability distribution (represented by shaded grey area) of the calibrated dates.



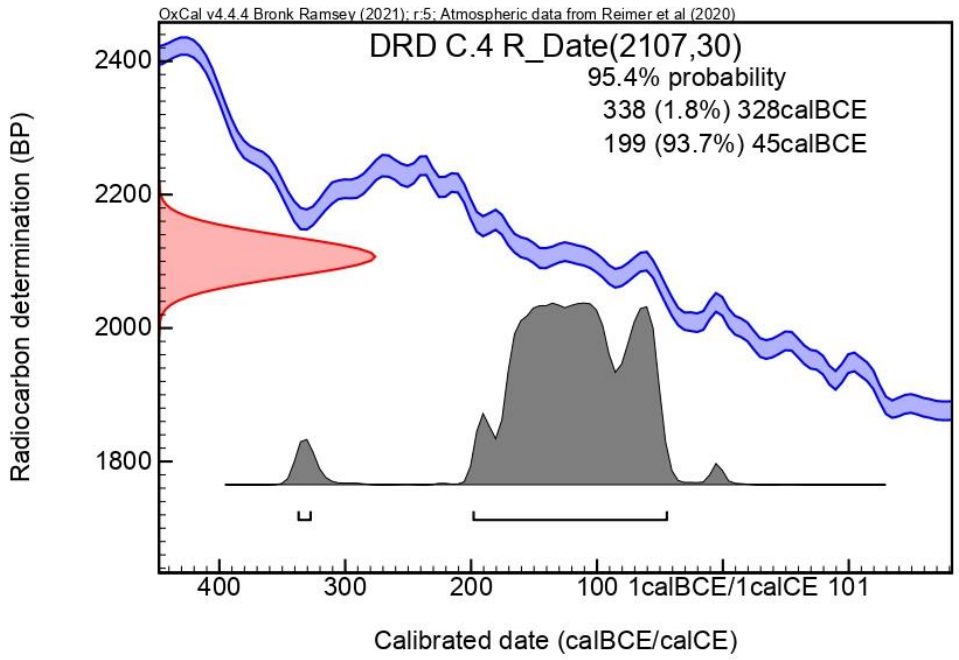
Graph 18. Calibration curve for DRD C.1



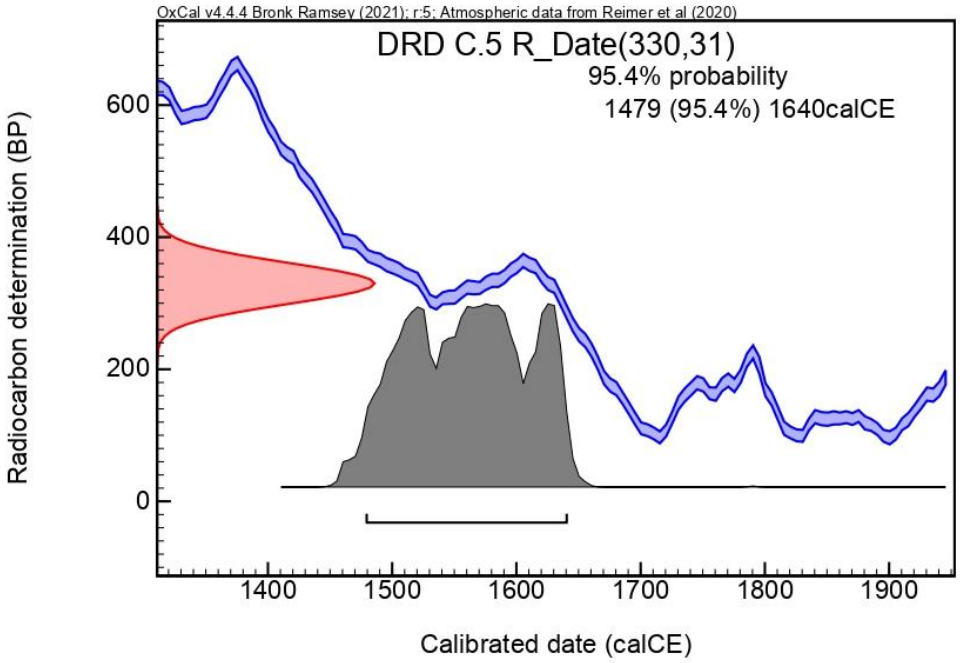
Graph 19. Calibration curve for DRD C.2



Graph 20. Calibration curve for DRD C.3



Graph 21. Calibration curve for DRD C.4



Graph. 22. Calibration curve for DRD C.5

Therefore, the radiocarbon dates and the calibrated dates with their respective standard deviation is presented in the table below.

Sl. No.	Sample name (IUAC code)	Radiocarbon date (BP)	Standard Deviation (±)	Calibrated date range (BCE/CE)
1.	DRD C.1 **(**23C6558**)**	980	36	1016 CE – 1159 CE
2.	DRD C.2 (23C6559)	357	26	1547 CE – 1635 CE
3.	DRD C.3 (23C6560)	345	33	1468 CE – 1638 CE
4.	DRD C.4 (23C6561)	2107	30	`199 BCE- 45 BCE
5.	DRD C.5 (23C6562)	330	31	1479 CE – 1640 CE

Table 19. Table showing the Radiocarbon age, standard deviation and the caliberated age of charcoal samples

5.3. Discussion

5.3.a. The 'Where': Determining the provenance of the artefacts

Provenance studies of ceramics in archaeology uncover intricate narratives of human activities in the past. By analyzing the clay composition and their chemical and mineralogical characterization, researchers trace the origins and routes of pottery. Chemical analysis such as EDX decipher elemental signatures, locating clay sources and production centers. Such investigations illuminate cultural exchanges, economic patterns, and technological advancements, elucidating socio-political, inter and intra-regional dynamics. Out of the above mentioned techniques, EDX/EDS,

pXRD and FTIR have been taken into account and corroborated to understand the chemical and mineralogical characterization and composition of the samples.

The pottery sherds collected from Daramdin were the first of its kind to be analysed from the region. A dearth of previous literature on any aspect of pottery rendered us to opt for scientific analysis of the pottery samples in order to answer questions of provenance and production technology. Therefore, the analysis was conducted on 4 pottery samples and 5 soil samples to determine the elemental composition and mineralogical composition. This enables us in identifying the provenance of the clay that was used to make the pottery. In that regard, Energy Dispersive X-Ray spectroscopy (EDX) has divulged valuable information regarding the composition of the elements present in the pottery and soil samples. Elements like Oxygen (O), Silicon (Si), Aluminium (Al), Potassium (K) and Iron (Fe) are found in the soil samples as well as pottery samples. However, elements in smaller quantities like Magnesium (Mg) are found in 2 pottery samples (DRDP.1 and DRDP.3) and two soil samples (DRDS.4 and DRDS.BS). Phosphorus (P) is present in one pottery sample (DRD P.2) and one soil sample (DRDS.BS). Bromine (Br) which is present in two pottery samples (DRD P.1 and DRD P.2) is, however, absent in the soil samples. Furthermore, there are elements found in trace amounts in the soil samples, which are absent in the pottery samples. These elements are Niobium (Ni) in DRD S.1 and DRD S.4, Calcium (Ca) in DRD S.2 and DRD S.BS, Tantalum (Ta) in DRD S.2 and Zirconium (Zr) in DRD S.BS. It is observable that the weight percentage of the elements present in both soil samples and pottery samples (O, Si, Al, Fe and K) are in approximate alignment with each other. To corroborate the elemental composition of the samples, a mineralogical composition was determined with the help of Powder X-Ray Diffraction (p-XRD) technique. Powder XRD and Energy Dispersive X-ray Spectroscopy confirmed that Quartz **(**SiO_2**)** abound the composition of

the pottery sample. Along with quartz, there are other minerals like Goethite **(**$FeHO_2$**)**, Hematite **(**Fe_2O_3**)** Illite ($KAl_2[Al_{0.65}Si_{3.35}O_{10}](OH)_2$) Microcline ($KAlSi_3O_8$), Kaolinite ($Al_2Si_2O_5(OH)_4$) and Graphite (C). The vibrational assignment around 1034 cm^{-1} corresponds to the kaolinite derived from red clay sources, as noted by Singh and Sharma (2016, p. 559). Therefore, all the four samples with assignments 1056 cm^{-1}, 999 cm^{-1},1095 cm^{-1}, and 1039 cm^{-1} indicate the red clay origin of kaolinite.

The similarity in the elemental and mineralogical composition of pottery samples and soil samples suggests that the pottery samples collected from the field were likely manufactured using local soil from the region.

5.3.b. The 'How': Determining the manufacturing technique of the pottery samples

There are numerous aspects of pottery production process, out of which, firing temperature and firing condition play a major role. The conditions under which pottery is fired—whether in an oxidizing or reducing atmosphere or the maximum temperatures achieved during the firing process provide valuable insights into the manufacturing technologies used by artisans at specific temporal and spatial contexts. Thermal analysis in archaeology serves to discern material properties and thermal behavior of the samples by identifying compositional changes, degradation, or manufacturing processes. The knowledge about firing processes in ceramic production helps to better understand the technological progress of a culture at a given time and space. Additionally, it also gives an idea on the techniques of conservation and restoration of ceramics (Palanivel and Kumar, 2011). For the pottery samples of Daramdin, the objective is to estimate the original firing temperature range of the samples and to determine the firing atmosphere. With the help of TGA-DSC coupled with data from pXRD and FT-IR, the above mentioned objectives are looked into.

The estimation of the firing range and temperature of pottery is based on the fact that once the clay is fired at a fixed temperature and then cooled down, the property of the clay will not be altered unless the clay is subsequently re-fired at a temperature higher than the initial firing temperature (Ravisankar, et al., 2010, Singh and Sharma, 2016, Palanivel and Kumar, 2011). Goethite, decomposes into Hematite at 300°C (Gialanella et al. 2010: 868) when the pottery is fired in an oxidizing atmosphere (Dey, Carter and Swift, 2020, p. 379). Moreover, Microcline is stable below the temperature of 500°C (Haldar and Tišljar, 2014, p. 76).

The presence of hematite is a significant determinant of firing temperature as well as firing condition resulting in the red colour of the pottery (Singh and Sharma, 2016). The presence of hematite is suggestive of the fact that the pottery was fired at an oxidizing atmosphere using open kilns (Velraj, Tamilarasu and Ramya, 2015; Velraj, Seetha and Hemamalini, 2014; Dey, Carter and Swift, 2020).

The firing condition of the ceramics can be inferred from the colour of the pottery sherd. If the colour ranges from orange to brown it is indicative that the pottery has been fired in an oxidising atmosphere (Nodari, et al., 2007; Ther, et al.,2019, p. 1158; Tite, 2008, p. 220). Based on this, it can be asserted that the three pottery sherds (DRD P.1. DRD P.2 and DRD P.3) were fired in an oxidising condition. The fourth sample (DRD P.4), however, is black in colour. The black colour of the pottery is typically achieved in two ways – when a pottery is fired in a reduced atmosphere where there is nucleation of the black coloured oxides of iron like magnetite (Fe_3O_4), and by way of smoking or smudging technique where the carbon particles cover the surface and penetrate the pores of the vessel thus imparting a black colour (Amicone et al., 2021, p. 543). The EDX and pXRD results have shown that the presence of carbon (by EDX) and Graphite (by pXRD) in DRD

P.BP and the absence of magnetite thus suggesting theoretically that it may be smudging of carbon during firing that led to the black colour of the pottery.

A characteristic feature of well fired pottery which is fired above the temperature of 850º C, is the presence of new crystallised minerals like diopside, gehlenite anorthite and hematite whereas, ill fired pottery which is fired below 750º C exhibit high amount of calcite and the absence of above mentioned minerals (Daghmehchi, et al., 2018). However, this argument stands questioned on the basis of TGA-DSC analysis where the pottery sherds are fired below the 800 ºC and 660 ºC respectively yet do not contain calcite. The presence of microcline in the pottery is indicative of the fact that the firing temperature may have been below 500 º C since microcline is stable only below the temperature of 500 º C. The presence of illite/muscovite in the samples however, propose that the firing temperature may be between 600 ºC-850 ºC (Bayazit, et al., 2013). However, Daghmehchi et.al (2018) suggested that the strong band around 1039 cm^{-1} which is related to di-octahedral mica (illite) indicated that the firing temperature may be above 600º C -700º C. The presence of hematite in DRD P.2 and DRD BP might suggest that the pottery sherds were fired in open kilns in an oxidizing condition. Magnetite is converted from Hematite at a temperature of 800º C -850º C in reduced condition that is, when the pottery is fired in closed kilns where there is a lack of oxygen (Palanivel and Kumar, 2011, Dey, Carter and Swift, 2020). The strong bands around 461 cm^{-1} is alluded to Si-O-Si bending of microcline (Velraj, Tamilarasu and Ramya, 2015; Singh and Sharma, 2016). However, Bayazit et.al. (2013) mentions that the bands around 456 cm^{-1} is suggestive of the presence of illite/muscovite.

In order to substantiate the results obtained from Fourier Transform Infrared Spectroscopy (FTIR), X-ray Diffraction (XRD) analysis was conducted. This strategic approach is commonly employed

in scientific investigations, particularly in fields like materials science and chemistry, to provide a comprehensive understanding of the properties and composition of substances.

As per the XRD and FTIR analysis, the clay used to manufacture pottery is composed of quartz, goethite, hematite, microcline, and illite. Since there is no presence of magnetite in the samples, it can be suggested that the pottery was probably fired below 800 ºC in an oxidizing condition. This argument is also supported by TGA-DSC which cites the absence of calcite to attribute the firing temperature to be below 800 ºC. However, the presence of microcline in the samples confirmed by both FTIR and XRD leads us to believe that the firing temperature of the pottery could be below 500 ºC. Therefore, it can be stipulated that the potsherds were fired at a temperature ranging from below 500º C to 800 ºC in an oxidizing atmosphere i.e., in open kilns.

Thus combining the above mentioned analytical techniques, the firing condition of the pottery samples in oxidizing atmosphere. All the four pottery sherd samples were fired at the temperature range of 300-650 ºC. The lower limit is decided on the presence of Goethite in all the samples as indicated by XRD which transitions to Hematite at 300 ºC. Similarly, TGA-DSC points out that Kaolinite transitions to meta Kaolinite at the temperature highest by 650 ºC. Therefore the presence of Kaolinite implies that the firing was below 650 ºC. Additionally, the presence of Goethite alongside Hematite leaves us to believe that the potsherds were unequally fired due to being fired in open kilns (Velraj, Seetha and Hemamalini, 2014).

5.3.c. The "When": Dating the Charcoal samples

The calibrated dates obtained from 14C dating of charcoal samples have given us a range of dates from 199 BCE to 1640 CE in the probability distribution. The dates obtained can be grouped into three categories for the ease of understanding. The first date range falls between 199 BCE to 45

BCE. The second date range falls between 1016 CE - 1159 CE and the third date range falls within 1468 CE to 1640 CE. What is striking is the fact that the three dates from DRD C.2 (1547 CE - 1635 CE), DRD C.3 (1468 CE – 1638 CE) and DRD C.5 (1479-1640 CE) coincide with the time period of the establishment of Namgyal Dynasty in Sikkim. The first Ruler of the Namgyal Dynasty- Phuntsuk Namgyal was coronated at Norbugang in Yuksom in the year 1642 CE.

While very little found its way into the records before the establishment of the Namgyal Dynasty, the oral and written narratives often talk about the visit of Guru Padmasambhava (or Guru Rinpoche as he is reverently known) in the 8th Century and the accounts of Terton She-rab Mebar (1267-1326) and saint Dorje-Lingpa (1346-1405) (Namgyal & Dolma, 1908, pp. 6-7). This is to say that Sikkim was not absolutely uninhabited and the charcoal samples collected from Daramdin go on to suggest that there was human presence in the region.

As discussed earlier, Sikkim's artefactual repertoire until now was concentrated mainly towards stone tools which although was not dated absolutely but was broadly assigned to Neolithic period by previous scholars. It will be erroneous to directly associate the earlier date ranges mentioned above with the prehistoric past of Sikkim, given that no stone tool was recorded in the study area during explorations. However, the presence of charcoal in the region in a buried context highlights an important aspect of the presence of anthropogenic activities in the region dating back to possibly 199 BCE.

5.4. Conclusion

This chapter discusses the analysis of samples using various scientific techniques based on the objectives outlined at the beginning. The provenience of the pottery sherds was analyzed with the help of techniques like Energy Dispersive X-Ray Spectroscopy (EDX) for determining the

elemental composition of pottery and soil samples corroborated by powder X-Ray Diffraction (p-XRD) and Fourier Transform Infrared Spectroscopy (FTIR) for mineralogical composition. By comparing the similarities and dissimilarities of elemental and mineralogical composition of the pottery and soil samples, the study argues that the pottery samples were in all probability made from the soil sourced from the same region.

As regards the pottery production technique, the study has attempted to ascertain the firing temperature of the pottery samples with the help of p-XRD, FTIR and Thermogavimetric Analysis – Differential Scanning Calorimetry (TGA-DSC). The results indicate that the pottery samples were fired in the range of 300-650 °C. Additionally, the charcoal samples found in association with the pottery samples have provided a date range of 199 BCE to 1640 CE.

The elemental and mineralogical composition of the pottery analyzed in this study is similar to that of pottery from Northeast India, as described by Singh et al. (2018). In their research, Singh et al. employed Scanning Electron Microscopy-Energy Dispersive X-ray Spectroscopy (SEM-EDX) and Laser Induced Breakdown Spectroscopy (LIBS) to examine the elemental and mineralogical characteristics of their pottery samples. The results revealed the presence of kaolinite, goethite, quartz, illite, microcline, and hematite, among other minerals. These findings are consistent with the mineralogical composition observed in the pottery samples examined in the present study. Moreover, red clay origin of Kaolinite as indicated by FTIR finds similarities with two pottery samples of Ambari, Assam, India (Singh & Sharma, 2016, p. 559).

Chapter 6

Concluding chapter

This chapter presents an overview of the thesis, emphasizing the key contributions of the study. The findings based on the research objectives and research questions outlined in the introductory chapter will be addressed here. It also discusses the limitations of the research and suggests potential directions for future investigations. The study comprises two parts. One part deals with megaliths and the other part deals with pottery. The study is an exploratory research in a region where very few archaeological investigations have been conducted thus far. The methodology considered for the study is archaeological method of exploration, ethnographic methods to locate parallels in the present and scientific methods to understand the provenance of the artefact, manufacturing technique and chronological frameworks of the artefacts mainly pottery sherds. Megaliths that were documented exhibited continuity in their usage hence, it is challenging to evaluate the temporal framework of the megaliths.

In consideration of the research question regarding the purpose of the existence of megaliths in this region and the hypothesis that Sikkim-Darjeeling had a megalithic culture, chapter 2 compiles and describes the different kinds of megaliths and chapter 4 discusses the roles and functions of the megaliths of Sikkim in relation to the wider context of megalithic cultures of the regions that surround Sikkim. The findings and description of the megaliths suggest that they had various roles and functions like some were erected for historical remembrance, some had liturgical functions and some are anticipated to have acted as way markers and landscape indicators.

It was for the dearth of previous studies regarding megaliths in Sikkim that we turn towards the neighbouring regions where the megaliths have been extensively documented and investigated.

Therefore, what is discernible in terms of the functions of megaliths of Sikkim-Darjeeling Himalayas is the fact that they served different functions like landscape indicators and commemorative stones but were conspicuous by their absence as funerary monuments. This is in alignment with the megalithic traditions of Tibet where megaliths often assumed functions like ritual monuments or way finders along passes and mountains. Therefore, we gain a significant understanding that there was influence of Tibetan culture in Sikkim when viewed from the lens of megalithic traditions as illustrated by the example of the name *lha-tu*, which is shared by both the Tibetans and Lepchas residing in Sikkim.

The findings however indicate that in Sikkim-Darjeeling Himalaya, the megalithic culture had a distinct nuance of its own which differed from that of Eastern India, practiced mainly in regions of Jharkhand or North East India which had megalithic traditions ranging from sepulchral functions to recording events. Unlike these two regions where the numerical strength of the megaliths is significantly high, the intensity or the number of megalithic structures in the study area is comparatively low. However, a striking feature that the megaliths of Sikkim-Darjeeling region exhibit is that fact that a single monument holds much power and command over the landscape as well as the memory of the people that folktales, legends and narratives are weaved around it. The standalone monument represents a past defining activity in the landscape as is exemplified in the case of the megaliths of Mahakala Dara Temple or Kabi Lungchok.

The practice of erecting megaliths has lessened, but the ones previously erected are still in use in various forms as well as the idea of megaliths being erected in the past can still be seen in the rituals and customs practiced today. Through this evidence we also see that though there is continuity of material evidence amidst changes in the narratives, beliefs and customs around it have undergone transformation.

With regard to pottery sherds documented from Daramdin and analysed using scientific techniques, this study strikes through the notion that Sikkim did not have a tradition of manufacturing pottery. The analysis discussed in Chapter 5 further suggests that in West Sikkim, pottery was produced in the same region as there was a match in the elemental and mineralogical composition of the soil of the region and the pottery sherds and were fired between 300-600ºC, in an oxidizing condition. Furthermore, the charcoal found in association with the pottery sherds, on analyzing with 14C (using AMS) analysis provided a time frame ranging from 199 BCE to 1640 CE.

The key contribution of this study therefore is that it provides a starting point for the investigation of megalithic traditions of the region and the pottery traditions of the region along with the chronological framework for the archaeology of Sikkim within which different activities like pottery production is situated. Therefore, its novelty also lies in the fact that it represents the first study of its kind to be conducted in the region.

This study takes the investigation a step forward from the previous studies by venturing into the realm of pottery and megaliths where previous archaeological studies in the region have mostly been directed towards the investigation of stone tools - neolithic celts. These neolithic celts are colloquially termed as *Sadaer Long* in Lepcha language and *Bajra Dhunga* in Nepali. However, the study area did not yield celts during the course of exploration but the respondents were well versed with the beliefs and myths attached to them. At present, *bajra dhunga* is mainly found in the possession of Shamans of different communities, who are known as *Jhakri, Phedangma and Bongthing,* for different shamanic and ritualistic purposes. The celts are believed to have protective and curative functions. The belief which prevails is that lightning or thunderbolt would not strike the house which possessed thunderstones. Hence, it was learnt during the course of fieldwork that,

at present, if a family possess *bajra dhunga* there is a practice of burying them while laying the foundations of a new house or keeping them hidden. Also, it is believed to cure various illnesses as well as help relieve complexities during child birth in humans and animals. While the practice of keeping *Bajra Dhunga* at home is regarded auspicious, there seemed to be a lack of recognition regarding the significance of these stones as evidences of the past, since, the respondents recounted accounts of these stones being lost due to negligence, indifference or unawareness.

The limitation of this study, however, is that the study area taken is only limited to West Sikkim for pottery. The information regarding the location and distribution of pottery sherds was exclusively relied on the local knowledge shared by the inhabitants and the pottery sherds on the surface could be seen only at one spot called Chyandara from where the samples are collected. Regarding the megaliths, at the initiation, prior knowledge of its existence and the narratives associated with it guided the study in looking into the practices and beliefs associated with megaliths in this region. As previously noted, since megaliths illustrate continuity in their usage, the temporal framework could not be ascertained within the limits of this study.

Furthermore, while the radiocarbon dating of the charcoal samples indicated an age range from 199 BCE to 1640 CE., a definitive association between the pottery sherds and the charcoal dates could not be effectively established within the scope of this research. However, a major development in the region's archaeology is that the AMS dates of charcoal samples provide us with a comprehensive chronological framework that has not been previously established. The findings indicate that human activities were present in the region as early as 199 B.C.E., thereby contributing significant insights into the prehistoric timeline of the area while also stressing on the aspects of crafts like pottery production which were categorically denied by previous studies.

Appendix 1

The legend of Teesta and Rangeet

The importance of Tendong Lho Rum Faat originates from the Legend of Teesta Rangeet River. In the imaginative geography of the Lepcha folklore, Teesta and Rangeet are regarded as lovers. Teesta, originally known as *Rongnue* by the Lepchas is a female, and the Rangeet, a male. When love blossoms between the two, they meet at a quiet forested place called Pazok and go off to the plains to live a life of solitude and peace. Since neither had ever ventured out of Sikkim, Rongnue seeks the help of a serpent to guide her through the hills and valleys of Sikkim, while Rangeet follows a partridge. The serpent, with due diligence, guides Rongnue out of Sikkim. Conversely, the partridge, with his tardiness, dilly-dallied across forests and hills. As a result, when Rangeet reaches his destination, his lover is already waiting for him. On seeing her, he exclaims "*Thi-sa-tha*!" which translates to 'When did you arrive?'. Since then the name "*Thi-sa-tha*' has stuck with river Rongnue which has persisted by the name Teesta. Rangeet was too ashamed to have made Rongnue wait, so much so that his guilt makes him turn and go back to where he came from. Rongnue swiftly follows him in an attempt to persuade him causing massive flood, destruction, and chaos along the way. Dwellings are submerged, and humans, animals and vegetation are swept off. Just then, to save themselves from the fury of the rivers, the inhabitants of the region begin to climb a hill called Tendong/Tungrong in South Sikkim. The inhabitants perform a ritual invoking Mother Itbumoo to intervene and pacify Rangeet. Chi is sprinkled all over and Mother Itbumoo arrives in Tendong in the appearance of a bird *Kahaom Fo.* Mother Itbumoo is successful in doing so, and from thereon, Rongnue and Rangeet reconcile and continue their journey towards the plains.

Appendix 2

The legend of Kabi Lungchok

According to the legend, Gyad Bumsa was recognized for his strength and valour. The legend as documented by Saul Mullard (2011, pp. 38-43) mentions that he was the descendant of the 8th Century CE King of Yarlung Dynasty Trisong Detsen. Gyad Bumsa along with his father and brothers, embark on a journey in search of *Bayul Demazong* (the Tibetan name for Sikkim). Along the way they paused at Pakshi (possibly Phag ri) to erect a temple, where one of Gyad's brother stay behind as an abbot. Continuing their journey to Phag ri (or alternatively Kahm bu), they built another temple name Bsam grub Lha Khang. Gyad Bumsa proceeded southwards through Gro mo and Chu mo gshang until he reaches Chumbi, where he built a residence. Despite staying in Chumbi for three years, Gyad Bumsa and his wife Jomo Guruma were unable to conceive. Upon learning of a Lepcha Shaman and chief in the neighbouring Sikkim (known as Demazong then) who could solve their problem, Gyad bumsa ventured into Sikkim with sixteen followers, entering through the Chu la pass (also written as Chola pass). Once in Sikkim Gyad meets the elderly couple who agreed to help. After they returned to Chumbi, Jomo Guruma conceives thrice and gives birth to three sons. To express gratitude, Gyad decided to return to Sikkim to offer prayers to the local deities and host a feast for Tek. They met at Dong Tsa Dong to perform prayers and hold a feast solidifying their friendship through rituals and oaths. As time passes, Gyad Bumsa expands his influence over the Lepchas and eventually annexes Sikkim to his territories.

According to the History of Sikkim (1908) the couple arrived at Sa-tha-la, Sideong, Longchok and Ringstom where Gyad Bumsa and Jomo Guruma first met Thikung Tek and Nikun Ngyal (Thikung

Tek's wife) when they were engaged in agricultural chores. Thikung Tek is said to have prophesized that she would have three children, the descendants of whom would start a royal lineage. The legend mentions that Jomo Guruma was able to conceive three sons and out of gratefulness, the Bhutia couple came to meet the divine couple when both the parties forged an eternal pact of brotherhood. The Blood Brotherhood Treaty was to bind the two communities in harmony. The fact that it was called a blood brotherhood treaty was because the treaty was concluded with a ceremony in which a large number of animals- both wild and domestic were sacrificed (Namgyal and Dolma, 1908). The local deities which probably are the deities worshipped by the Lepchas were invoked for the ceremony as the two couples sat on hides of animals and soaked their feel in the blood of the animals which were sacrificed.

The legend talks about blurring the boundaries to share a territory or a landscape based on unity and brotherhood. The location was thus marked by the erection of stones, haphazardly arranged signifying enduring friendship made by leaders of two groups – the inhabitants and the new comers to the land. These stones, *longchoks* not only memorialize the perpetual oath undertaken by the leaders but also possibly conveyed a significant message – the indigenous Lepchas were amenable to the settlement of the newcomers in their territory, indicating a mutual acceptance and assurance of safety for subsequent generations of Bhutias to co-exist harmoniously with the local inhabitants.

Appendix 3

The Legend of *Sokpa Dhunga*

The legend of the Yeti, colloquially and popularly known as *Sokpa,* is well-received in Samanden. The term "*Sok-po*"[viii] is of Lepcha origin, and it means guardians (Siiger, 1978, p. 426). As the story goes, once upon a time, there was a Lepcha hunter who was proficient with his game. He was also a Shaman lauded for his superhuman endeavours. The Lepchas would come about hunting in *Lek* from *Aul*[ix]. When they reached Samanden, they would have considerable bounty collected along the way. It is believed that in Samanden, there were twin lakes where the hunters rested for respite and water. That is how, as the belief goes, the place acquired the name "Samalden", which was later altered to Samanden. The Lepcha Hunter-Shaman would come weaving his munitions to gather food which the Yeti, or *Sokpa,* would grab and take away. This way, the *Sokpa* troubled the Lepchas who came to Samanden to hunt and forage in the forest. Annoyed and frustrated with the scourge, the Hunter-Shaman devised a plan to get rid of *the Sokpas* once and for all. Since he was aware that they were giant beasts with whom a physical confrontation would be a strategically foolish endeavour, he intended to win over them using his intellect. The Hunter-Shaman decided to befriend them and proposed that when they meet next time, he will bring fruits and vegetables from *Aul* and that he should bring herbs, medicines and fruits from the alpine region as a mark of friendship. Both agreed upon the truce and started exchanging their bounties the next time they met. In the backdrop, the *Sokpa* was oblivious to the intentions of the Hunter-Shaman to get rid of him. Meanwhile, the Hunter-Shaman had been heating a round stone ball in the fire to make it red hot. While exchanging their goods, the Hunter-Shaman insisted that for this particular exchange, the *Sokpa* was required to close his eyes, as this is the tastiest and most extravagant produce of *the Aul* region. The *Sokpa* complied while he promptly placed the red hot burning stone inside *Sokpa's*

mouth. The *Sokpa* jumped in pain and resistance but eventually died. After that, a longish stone was erected at the end of the settlement in Samanden to demarcate each other's territories. At present, the stone is known by the name *Sokpa Dhunga* where the word Dhunga translates to 'stone'. A promise was thus taken that both parties would not cross this boundary, come what may. The sanctification of a natural entity into a cultural entity often indicates an interface between the invisible and the human world through ritualistic activities.

The Sokpa

The *Sokpa* or Yeti as a wild creature is widely known in Himalayan myth and mystery. The colonial writings mentioning their sightings in the alpine region of the Himalayas are umpteen with many beliefs, myths and folktales related to their appearance and activities. However, we rarely find material remains attributed to the Yeti, like in this case in Samanden, in the form of a boundary marker. There are two divergent outlooks regarding the idea of Yeti. Some believed it to be a figment of imagination and that it is only a species of monkey or bear (Nebesky Wojkowitz, 1957; Sawerthal and Torri, 2017). In contrast, the popular belief is that of their actual existence in the high mountains. Yetis have been the subject of awe in the Himalayan region as British officers posted in the Himalayan towns, mountaineers, administrators, traders, missionaries and travelers set forth narratives about this entity. They are known by different names. The word Yeti is said to have derived from the Sherpa word *yeh-the*, derived from Tibetan *g.ya' dred* (Snellgrove, 1957, p. 214). The Lepchas call them Jhampey Mung, *Chu Mung, or Lho Mung* (Sawerthal and Torri, 2017; Siiger, 1978). However, they are also known as *Dju Thing* or *Pong Rum*. *Dju Thing* is translated to Lord of the Hunt and Pong Rum as the God of hunters, whereas *Chu Mung* and *Lho Mung* refer to devils of the mountain[1] (Sawerthal and Torri, 2017; Little, 2007). The fact that both these suffixes are given to Yeti by the Lepchas infers their engagement with the forests, mountains and

hunting activities which perhaps altered when they started living sedentary lives (Siiger, 1978, p. 428). Anna Balicki (2008, p. 105) mentions that in Tingchim, North Sikkim, the inhabitants call Yeti by the name *latsen* who would roam around the mountain passes and were known to help Buddhist monks on their meditational retreat by bringing food and firewood for them. They are also known as *Jungli Admi*, *Sogpa or Sokpa* and *Migo* (Sawerthal and Torri, 2017, p. 125). The conceptualization of sacred landscape rests on the beliefs and practices (tangible and intangible) of the local inhabitants, who believe these places are inhabited by benevolent and malevolent Gods and Demons alike who must be pacified from time to time (Bentley, 2014). Kerry Little (2007, p. 95-96) mentions that the hunter clans who are no longer associated with hunting activities conduct an annual propitiation ritual to Pong Rum to express that they still remember the deity even though they do not carry out hunting activities presently.

Appendix 4

Chini Champa Dhunga of Lungyam

The residents of Lungyam were keen on narrating about a rather disparate stone which was apparently a huge boulder when it was existent and was situated about 50 meters from where the megaliths stood (GPS co-ordinates: 27°7'6.46" North, 88°9'52.21" East). As described by them, the boulder had two holes- a bigger hole which resembled a door, a sitting space where 2-3 adults or 4-5 kids could comfortably fit in and a smaller hole on the other side of the stone, almost the size of one's head which resembled a window. The boulder, therefore, looked like a shelter. The elderly people in the vicinity remember this boulder where they would play as kids in and out of the hole and nick named it as *chini champa dhunga.* The boulder has a legend attached to it. It is believed to be the origin place of Tilikchum or Chilikchum group of people. The accounts of the local residents of the place differ while citing the affiliation of the Tilikchum or Chilikchum to be a sub group of Rai, Limboo or Lepcha community. This boulder too was overturned and carried away by the river during the flash floods of 1968. There is very little information about the Tilikchum /Chilikchum group of people who is believed to be extinct now. On the contrary, Namgyal and Dolma (1908, pp. 14) mention Lungyam (which is spelt as Lunghem) near Dallam (which is present day Daramdin), in connection to a group of Lepchas whom they call "foremost" and "barbarian" called *Nah-ang*. The *Nah-angs* are believed to be extinct now. The belief regarding the Nah-angs and the Tilikchum/Chilikchum however seem strikingly similar.

Appendix 5

The legend of *Rumlyang Tungrong*

This folktale is premised in Daramdin in Soreng District in Sikkim. It starts with the creation myth of the Lepchas. The Mother Creator, Itbumoo, gives birth to two children. The male child is named Fudongthing, and the female is named Nazong-nyu. As they grew old, they were fond of each other to the extent that they ended up having an incestuous relationship and bore a child. They named the child Laso, and for fear of Itbumoo, they hid him in a cave. Nonetheless, the news of their incest reached Itbumoo, who expelled them from paradise where they were living. Growing up as a child, Laso was looked after by the spirits of the forest. After that, Fudongthing and Nazong-Nyu had six other children, all of whom were loved and cared for by their parents, now that they did not have to fear Itbumoo's wrath. With time Laso became resentful and jealous of his siblings, and to compensate for the lack of love received, he started torturing human beings. He came to be known as Laso Mung[x]. Laso and his antics tormented the inhabitants of the region to such an extent that they decided to go to heaven and live up there[xi]. In the process, they fled south to *Toonoo Tungshi*, the source of River Rammam and from there, following the course of the River, arrived at *Da Raom Dyen* (Tamsang, 1983; Tamsang, 2008). The original name of Rammam is *Ro Mam,* where *Ro* means fear, and *Mam* means hiding (Tamsang, 2008 p. 14). There they selected a flat land at *Tal-Laom Purtam*. The stairway that would lead them to heaven was made by piling up earthen pots, one on top of the other, at *Tal-Laom Purtam*. The preparations started in haste, and a section of people busied themselves in making the pots while others collected firewood to bake them. One by one, the men climbed the stairway, and when the man on top reached a considerable height, he wanted to gauge how far above *Rumlyang* was. He asked for a hooked stick from the people standing below and shouted "*Kok vim yang ta*", which means 'Pass

me a hooked stick' and the people below heard "*chyak ta*", which translates to 'smash it down'. The people below asked again if the instruction was to smash down the entire edifice, and those on top nodded with *"ak ak"*, which means 'yes'. The next moment, the stairway crumbled to the ground claiming many lives. The place's name was changed from *Tal-Laom Purtam* to *Da Raom Dyen*, meaning "we ourselves smashed it down" (Dolma, 2010, p. 49).

Appendix 6

A reference table for minerals and mineral groups

Table 20. A table for mineral and mineral groups present in the pottery sample.

Sl. No.	*d*-value (Å)	Mineral	Mineral Group
1.	4.99	Illite (Drits, et al., 2010)	Silicates
2.	4.89	Magnetite (Hudson Institute of Mineralogy, 2000)	Oxides, Hydroxides
3.	4.25	Quartz (Buzgar, et al., 2010) (Singh and Sharma, 2016)	Oxides, Hydroxides
4.	3.33	Quartz (Buzgar, et al., 2010, Singh and Sharma, 2016)	Oxides, Hydroxides
		Microcline (Bailey, 1969, Hudson Institute of Mineralogy, 2000)	K-Feldspar
5.	2.45	Goethite/Quartz (Singh and Sharma, 2016)	Oxides, Hydroxide
6.	2.27	Quartz (Singh and Sharma, 2016)	Oxides, Hydroxides
7.	2.12	Quartz (Singh and Sharma, 2016)	Oxides, Hydroxides
		Graphite (Hudson Institute of Mineralogy, 2000)	
8.	1.99	Microcline (Blasi, De Pol Blasi and Zanazzi, 1987)	K-Feldspar
9.	1.81	Quartz (Singh and Sharma, 2016)	Oxides, Hydroxides
10.	1.66	Illite (Drits et al., 2010)	Silicates
		Kaolinite (Tamilarasu, Anbarasan and Velraj, 2017)	Kaolin
		Hematite (Singh and Sharma, 2016)	Oxides, Hydroxides
11.	1.54	Quartz/Kaolinite (Singh and Sharma, 2016)	Oxides,
		Quartz (Tamilarasu, Anbarasan and Velraj, 2017)	Hydroxides/Kaolin
		Graphite (Hudson Institute of Mineralogy, 2000)	Oxides, Hydroxides

12.	1.37	Quartz (Singh and Sharma, 2016)	Oxides, Hydroxides
13.	1.28	Microcline (Downs, Swaminathan and Bartelmehs, 2003)	K-Feldspar
14.	1.19	Illite (Drits, et al., 2010)	Silicates

Appendix 7

Photographs from the field

Figure 25. Buckwheat cultivation in the fields of Daramdin

Figure 26. Photographs from the field

Figure 27. A shaman showing the researcher a stone celt in his possession

Glossary

Aul	The places with relatively warmer temperatures
Aule joro	Malarial fever
Baisakh	A month in the Nepali calendar which corresponds to April-May
Bajra Dhunga	A thunder stone. *Bajra dhunga* is a nepali term given to a Neolithic celt.
Bayul Demazong	A hidden valley of rice. It is a term used by the Bhutias for Sikkim.
Bongthing	A male Lepcha priest
Chamal	Nepali word for rice grains
Cherim/Chirim	A festival celebrated by the Lepchas of North Sikkim
Chhogyal	The righteous king. The rulers of Sikkim were known as *Chhogyal*
Chhorten	A stupa of Buddhist affiliation
Chi	A drink made from fermented millet. The Lepchas use it for ritualistic purposes as well as for merriment.
Chulha Dhunga	A hearth stone
Dara	A hilltop in Nepali language
Devithana	An altar or a small shrine dedicated to a Goddess in Nepali language
Devta	A God
Dhara	A natural spring

Dhunga	A stone in Nepali language
Do-ring	Megalith, especially menhir in Tibetan language
Fagun	The month that corresponds to February-March
Gagri	A vessel usually made of copper and used to store water
Ghyampa	A round bulbous container used to store liquid
Gompa	A monastery of Buddhist affiliation
Haat	A weekly market
Janmashtami	A Hindu festival which celebrates the birth of Lord Krishna
Jhakri	A shaman
Jingkynmaw	A menhir erected by the Khasi community to commemorate a person, event etc.
Kalo Joro	Black fever
Khada	Tibetan silk scarf
Koko mendo	Tamang name for Oroxylum indicum flower
Kumale	A Potter
Lapchao	Pile of stones kept one on top of the other on wayside or on hilltops
Lek	The upper reaches of the region which are cold and snowy
Lha thu/ Lha tu/ Lha t'o	A stone monument erected atop a hill or on mountain passes to act as a landscape marker and direction marker for travelers.
Linga	A phallic object worshipped as a symbol of Lord Shiva
Longchok	Megalith in Lepcha language

Lung	A term for stone in Lepcha and Limbu language
Magh	The month that corresponds to January-February
Mandro	A cane carpet
Mangsir	A month in the Nepali calendar which corresponds to November-December
Mung	Evil spirit in Lepcha language
Nanglo	A woven cane tray used in Nepal
Paral	Dry hay
Phedangma	A shaman of Limboo community
Poornima	A full moon night
Push	The month that corresponds to December-January
Raksi	A distilled alcoholic drink from Nepal, India and Tibet
Rum	God in Lepcha language
Rum Faat	Worship of God
Rumlyang Tungromg	A stairway to heaven in lepchas language
Sadaer long	A stone celt in Lepcha language. In Nepali they are known as Bajra Dhunga
Sakelasili	A form of dance performed during Sakela festival
Sakelathan	An altar made during the observance of Sakela festival by the Kirata community
Shivratri	A Hindu festival celebrated in honour of Lord Shiva
Sokpa	A colloquial word for Yeti

Terma	A hidden treasure. The Termas were believed to have been hidden by Guru Padmasambhava across the length and breadth of the Lamaist realm. These treasures were in the form of manuscripts, visions or knowledge passed down from a teacher to a student.
Thaolong	A menhir erected at the entrance of a village by the Konyak Nagas
Thing	A good spirit in Lepcha Language
Thunche	Conical shaped basket made of cane. It is also known as Doko
Tilikxhum/Chilikchum	A subgroup of the Kirata Rai community who are believed to be extinct.
Titeypati	Local name for a woodworm plant (Artemisia vulgaris)
Totola ko Phool	Nepali name for Oroxylum indicum flower
Udhauli-Ubhauli	A ritual which is done twice a year which signifies moving down (*Udho*) and moving up (*ubho*)
Yul Lha	A good spirit in the Tibetan belief who protects the mountains and passes

Notes

[i] Telephonic conversation with an informant from Mungpoo, Darjeeling District on 08.10.2024

[ii] This claim is corroborated by the memory of a respondent (Age 72 years as of May 2022) of the place that there was a horse route from this place to Pulbazar in Darjeeling District, West Bengal, via which he used to go to Darjeeling Rajbari to pay his annual *Dhuri Khazana* or house tax until 1975. Now, one may wonder why a resident of Sikkim pays *dhuri khazana* to the Raja of Darjeeling in West Bengal. This might have to do with the course of the river which had changed owing to the flood of 1968. This incident must have altered the territorial boundary of Sikkim and Darjeeling which was reorganized in the year 1975 when Sikkim joined India as the 22nd state.

[iii] The Limboos are indigenous people of mainly Eastern Nepal. They call themselves Yakthungba or Yakthumba (endonym) and Tsongs or Subbas (exonym). The western region of Sikkim has a considerable population of Limboos due to its proximity to Eastern Nepal. In Daramdin, too, we find a significant number of Limboo population besides Lepchas and other communities of the Nepali fold.

[iv] Telephonic correspondence on 27/09/2022.

[v] The concept of *Yul lha* is territorial in nature as opposed to the worship of Bon and Buddhist sacred dieties who had regional or local influence. In that case the abode of the sacred spirits is usually a prominent place – a mountain or a hill which is then generally connected to a lineage or ancestors or origin myths.

[vi] The word *thaolong* which means a foundation stone or a marker stone (Wangjin 2014: 322) is similar to the term *longchok* where the word *long* means a stone. Additionally, even among the Mizos, the word for stone is *lung*, which is strikingly similar to *long.*

[vii] Doring is a name of a place in Eastern Tibet in the region of Kham. The term *Do-ring* also refers to menhirs. The name of the place was in all possibility kept after the existence of *Do-rings* in that location.

[viii] Pong-rum, the Lord of hunting, and two brothers, Mi-Tik and Tom-Tik, are named *Sok-po.* Moreover, Tom-Tik is believed to look like a bear.

[ix] The term *Lek* refers to colder regions in the upper reaches near the Himalayan foothills, and the term *Aul* refers to the region in the lower reaches with warmer climates.

[x] *Mung* means a devil in the Lepcha language.

[xi] Another version of the folktale suggests that the Lepchas were going to heaven to complain to the Gods about Laso's torture.

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Details of Publications, Seminars, Conferences and Workshops

Publications

- Chettri, U., & Sharma, S. (2024). Integrating folktales in archaeological investigations: A study from Sikkim Darjeeling Himalayas. Space and Culture, India, 12(3), 83-106. https://doi.org/10.20896/saci.v12i03.1513

- Chettri, U., & Sharma, S. (2024). The Longchoks of Sikkim and North Bengal: The need for heritage preservation and awareness. In S. Sharma, R. V. S. Uppaluri, V. Dutta, & A. Kashyap (Eds.), Policies for research and innovation: NERC 2022 (pp. 49-70). Springer. https://doi.org/10.1007/978-981-97-5681-0_4

Conference and Seminars

- Chettri, Upasna, and Sukanya Sharma. "Longchoks of Sikkim Darjeeling Himalayas: The Need for Heritage Preservation and Awareness." 8th National Young Historians' Seminar, 21-22 Sept. 2024, Centre for Indian Knowledge Systems, Indian Institute of Technology Guwahati, Guwahati.
- Chettri, Upasna, and Sukanya Sharma. "Tales, Toponymy, and Terrains: Exploring the Geography of Sikkim in Lepcha Folklore." Ninth Annual Conference of the Oral History Association of India: Mountain History—At the Intersection of Memory, Politics and Identity, 13-15 Mar. 2024, North Eastern Hill University, Shillong.
- Chettri, Upasna, and Sukanya Sharma. "Co-operation and Conflict in Lepcha Legends: The Story of Longchoks." Decadal Celebration of Anthropology in Sikkim University: Challenges and Way Forward, 7-8 Mar. 2024, Department of Anthropology, Sikkim University, Gangtok.
- Chettri, Upasna, and Sukanya Sharma. "Scientific Techniques for Analyzing Ceramic and Soil Samples from Daramdin, Sikkim." Graduate Research Meet: Humanities and Social Sciences in Transition—Perspectives, Exchanges, and Translations, 6-7 Jan. 2023, Indian Institute of Technology Guwahati.

- Chettri, Upasna, and Sukanya Sharma. “Between Oral Traditions and Archaeology: A Tale of the Stairway to Heaven.” International Seminar on Cultural Heritage of Eastern Himalayas and Northeast India, 25-27 May 2022, Southfield College, Darjeeling.
- Chettri, Upasna, and Sukanya Sharma. “The Longchoks of Sikkim and North Bengal: The Need for Heritage Preservation and Awareness.” North East Research Conclave, Assam Biotech Conclave, 20-22 May 2022, Indian Institute of Technology Guwahati.
- Chettri, Upasna. “Diffusion of Cultures in the Darjeeling Hills: Interplay of the Lepchas, Bhutias, and the Nepalese.” International Seminar on Assimilative Nature of Indian Culture and Its Continuity, 13-15 Dec. 2019, Benaras Hindu University, Benaras.
- Chettri, Upasna. “A Lhadipa’s Art: Thanka Paintings in Darjeeling.” Graduate Research Meet: Contemporary Trends in Humanities and Social Sciences, 1-2 Nov. 2019, Department of Humanities and Social Sciences, Indian Institute of Technology Guwahati.

Invited Talks

- Chettri, Upasna. “(Hi)stories of Places in Lepcha Tradition.” Weekend Lecture Series, 18 July – 22 Aug. 2021, Department of Geography, Malda College, Malda.
- Chettri, Upasna. “Of Canvas and Colours: A Case Study of Thangka Painting in Darjeeling.” Virasat Talk – 163 and National Webinar, 26 May 2021, Buddhist Heritage Research Institute in collaboration with Heritage Society – Kashmir Circle.

Workshops

- Chettri, Upasna. “Rewriting World Archaeology – South Asia Workshop, 2023-24.” Durham University, United Kingdom.
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