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## PREHISTORIC TOOL TECHNOLOGIES OF MANIPUR WITHIN THE SOUTH ASIAN PREHISTORIC ARCHAEOLOGICAL FRAMEWORK

**\*AHONGSANGBAM KINGSON SINGH & \*\*PROF. OINAM RANJIT SINGH**

*\*PhD Scholar Department of Ancient History and Archaeology, Manipur University  
ahongsangbankingsingh@gmail.com*

*\*\*Head, Department of Ancient History and Archaeology, Manipur University  
ranjitoinam09@gmail.com*

*This paper examines the prehistoric tools and technologies of Manipur in direct comparison with selected sites in South Asia, with the aim of situating Manipur within broader subcontinental technological traditions. Using evidence from Palaeolithic, Hoabinhian, and Neolithic contexts, the study compares lithic assemblages from Manipur with the Soanian chopper–chopping tool tradition of northwestern South Asia, the Kurnool cave complexes of peninsular India, and Hoabinhian-bearing sites of Northeast India such as the Garo Hills. Typo-technological analysis highlights shared features including pebble-based industries, direct percussion techniques, flake and blade production, and ground stone tools, while also identifying regional variations shaped by ecology and raw material availability. Neolithic comparisons emphasize affinities in cord-marked pottery, ground celts, and subsistence-related tools across eastern South Asia. The study demonstrates that Manipur’s prehistoric record represents an important eastern extension of South Asian technological traditions and contributes significantly to understanding cultural interaction, adaptation, and continuity within the South Asian prehistoric framework.*

**KEYWORDS:** *Prehistoric archaeology; South Asia; Manipur; lithic technology; Palaeolithic; Hoabinhian; Neolithic; chopper–chopping tools; cave and open-air sites; cultural interaction*

### INTRODUCTION

Prehistory refers to the period of human existence before the development of writing systems and before written records was created. Because no written documents exist for this era, knowledge about prehistory comes primarily from material remains such as stone tools, pottery, bones, cave art, habitation sites, and environmental evidence.

To study and understand the prehistoric culture of Manipur calls for an in-depth comparison with those regions having similar cultural affinities in terms of lithic tools and technologies left by the early humans. The prehistory of wider South Asia region and Northeast India in the Indian subcontinent is crucial to unravelled significant insights into the cultural development based on evolution of lithic tool technologies, and trajectories for early human migrations in the region. In the context of prehistoric archaeological research, Northeastern India which geographically connects to East Asia, South Asia, and Southeast Asia as it lies in the tri-junction of these three important broad regions must have played an important role as a cultural bridge between the three above-mentioned broad areas of Asian landmass.<sup>i</sup>

Manipur, which is located geographically at the crossed road between South Asia and South east Asia have occupied a unique position on the prehistoric map in understanding the nature of interaction and exchange of cultures of the prehistoric men across the regions. This chapter will delve further into the comparative stage of the study where similarity and differences will be highlighted across various selected sites of the South Asia region particularly Northwestern and Northeastern region of India with that of similar lithic finds from Manipur.

### **Palaeolithic/Old Stone Age**

From earlier scholarly works undertaken by O.K. Singh, the palaeolithic culture and its tool assemblages from Songbu and Khangkhui cave sites and three open air sites of Manipur have cultural affinities to that of South Asian sites such as WaramThebrongiri, Garo hills in Meghalaya, and Kurnool Cave in Andhra Pradesh having shared faunal association (e.g. Cervus and Bos, etc.). The pebble-chopper from the Machi site in Manipur are typo-technologically comparable to the Indian chopper-chopping tool tradition.<sup>ii</sup> However, closed comparison of the other Palaeoliths with the rest of Indian subcontinent cannot be established.

Additionally, Northeastern India's paleo-ecological settings and its proximity to migration routes during the Pleistocene may have shaped subsistence strategies and facilitated cultural exchanges.<sup>iii</sup>

### **Haobinhian connections in South Asia**

The Haobinhian is a cultural techno-complex which is a substitute for the Mesolithic culture in the context of both mainland and island Southeast Asia. According to Bellwood, the techno-complex of the Hoabinhian purely consist of pebble tools, flakes and small portion of edged-ground tools and bone tools. Later pottery and fully ground axes and adzes were also found in the Haobinhian techno-complexes. The term is used to refer to the lithic tool assemblages from the Terminal Pleistocene to the Early Holocene of Southeast Asia which is defined by unifacial, centripetal and circumferential cobble reduction and resulting flakes and debitage.<sup>iv</sup>

However, the term is under debate and the importance of the haobinhian is not fully understood in the context of India.<sup>v</sup> It is widely distributed across mainland Southeast Asia showing a significant pebble tool tradition which is characterised by chipped tools such as choppers, scrapers, and grinders. This techno-complex is found in South China, Vietnam, Cambodia, Thailand, Myanmar, Sumatra, Taiwan and is reminiscent of older chopper-chopping tool complex.<sup>vi</sup>

It has its extension to Manipur and Northeast India lithic tool complexes. In Southern China, such lithic tools are often associated with charred bones, shell middens, etc. However, in Vietnam, Haobinhian tool complexes are commonly found in cave sites. Notable sites include the Son Vi culture of Vietnam. Typo-technologically, Haobinhian culture represents a transitional phase between the Palaeolithic and Neolithic periods.

In the context of Manipur, Hoabinhian culture is evidenced by chipped pebble tools and edge-ground tools from sites such as Nongpok Keithelmanbi and Tharon cave site. The Nongpok Keithelmanbi sites yielded lithic tools such as chopper, scrapers, and blades made from quartzitic sandstones and chert. In the present study hoabinhian sites from Garo Hills Meghalaya is compared with that of Manipur hoabinhian sites. This comparative study offers insights into the wider cultural and technological connections between Manipur in Northeast India and Southeast Asian region during the prehistoric period.

### **Neolithic/ New Stone Age**

The Neolithic or New Stone Age remains of Manipur shows extensive cultural similarities to both South and Southeast Asia. In the context of Indian subcontinent, corded wares from the Neolithic phase are discovered from limited sites like Daojali Hading in Assam, Sarutaru and areas of the Ganga Valley. These sites shared cultural affinities with that of the Neolithic sites from Manipur. However, the tripod ware from Manipur is nowhere to be found in these sites of the Indian sub-continent. Cord marked pottery are also reported from neolithic sites in Andhra Pradesh which suggest blending of eastern and southern neolithic tradition. Despite its

similarities, unique variations in Manipur neolithic assemblages highlight regional adaptations. Prehistoric migration routes along the Salween, Irrawady, and Chindwin Rivers have also facilitated the spread of Neolithic culture from East Asia and Southeast into Manipur. This cultural blending with China and Southeast Asia has shaped Manipur's distinctive Neolithic tradition which is characterised by its cord-marked pottery, tripod wares, and quadrangular tools.

The present comparative study will be able to highlight the significance of prehistoric archaeological findings from Manipur. It will also contribute in the understanding of larger pattern of human migration across Northeast India, their cultural and genetic diffusion, and environmental adaptation during the Late Pleistocene and Early Holocene Epoch. The region helps in bridging the gap between South and Southeast Asia from time immemorial. The study emphasis the prehistoric archaeological findings from Manipur's as a vital link in prehistoric human past.

### **COMPARATIVE INSIGHTS ON THE PALAEOLITHIC SITES FROM MANIPUR WITH SELECTED SITES IN SOUTH ASIA REGION**

The Palaeolithic culture of Manipur from the excavated sites have certain significant affinities with that selected sites in South Asia region particularly from the Indian subcontinent. Keeping in line with earlier research work, present study is a broad-spectrum comparative approach to the prehistoric cultural assemblages of Manipur. The study will comparatively investigate that of Soanian Chopper-chopping tool tradition of the Lower and Middle Palaeolithic, the Kurnool Caves sites with distinctive limestone implements, bone tools and faunal remains.

#### **Comparison with pebble-chopper tool complex of the Soan Culture, Pakistan with that of the pebble-chopper tool from Machi, Manipur**

##### **Pebble-chopper tool complex of the Soan Valley, Pakistan:**

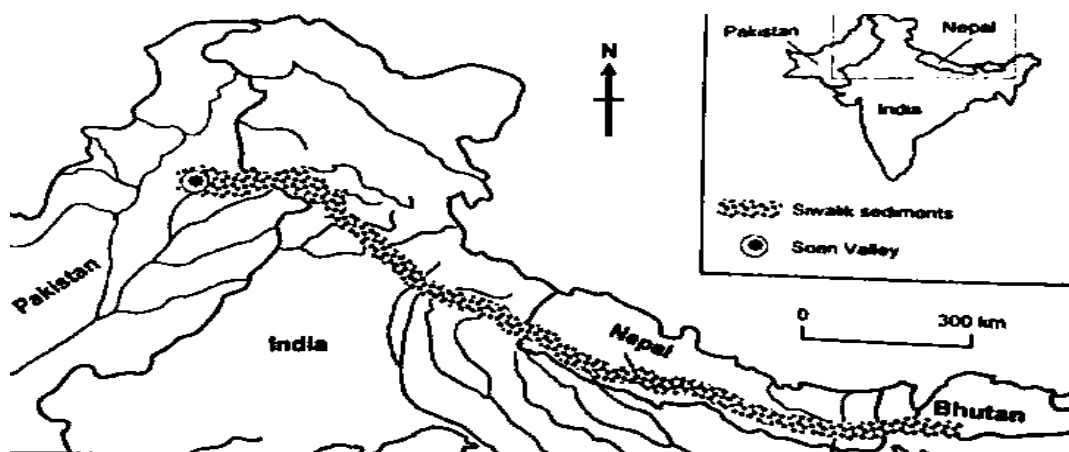
The Soanian culture named after the Soan valley is the earliest palaeolithic technological culture from the Siwalik Hills of present-day Pakistan.<sup>vii</sup> In 1939, Anthropologist and Archaeologist team led by H.de Terra of the Yale University and T.T Paterson of the Cambridge University were the first to discover and named this culture in the Indian subcontinent.<sup>viii</sup> The Soan culture was represented using pebble-based tools also called as chopper-chopping tools. It formed the chief lithic tradition in the Sub-Himalayan region consisting of north and north-western India.

Typo-technologically choppers are worked on one side and are by nature “unifacial”, on the other hand the chopping-tools are worked on both the sides and are thus “bifacial” in nature. These tools despite its difference in crafting have served the same purposes of either chopping a tree or a piece of flesh from an animal body. The tools are crafted by direct percussion or straight hitting technique.

### Machi:

The site of Machi is in the present Tengenoupal district of Manipur erstwhile Chandel district. It is a Maring tribe village and have garnered archaeological interest after O.K. Singh exploration in 1974. The prehistoric archaeological artifact discovered from the site is a pebble chopper tool. From the flake scars of the tool, it was created using direct stone hammer technique.<sup>ix</sup> The material of the tool is quartzite and has a ventral surface with a pebble cortex.<sup>x</sup>

Figure 1: The Soanian Techno-complex (Sarmah,2022)<sup>xi</sup>



According to T.C. Sharma, the findings of a pebble chopper tool from Machi is significant in the study of the prehistoric archaeology of the region.<sup>xii</sup> This discovery unequivocally substantiates the notion that Manipur's ancient landscape was inhabited by stone age predecessors, tracing back to the early stone age or lower palaeolithic era.<sup>xiii</sup>

However, despite its importance, the exact age and chronological context of this archaeological site, solely reliant on stone tools, remain yet to be definitively ascertained.

On typo-technological comparison the Soan chopper tools are predominantly composed of quartzite and other locally available raw material such chert and sandstone. Similarly, the only pebble chopper from Machi is exclusively made from quartzite.

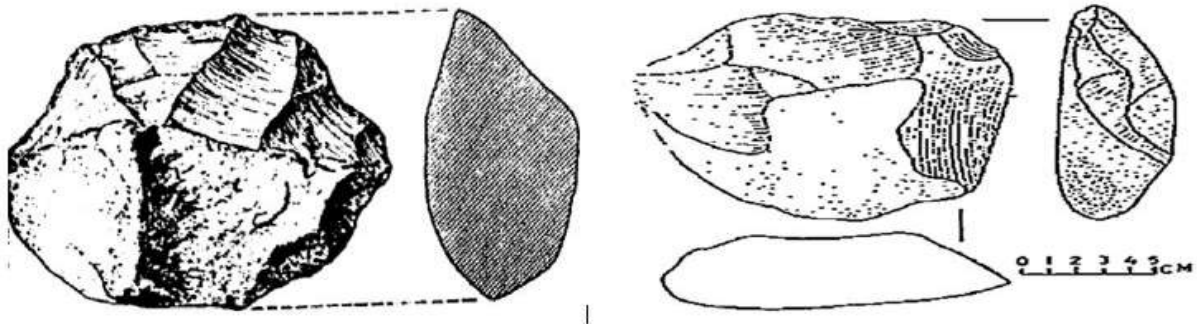


Figure 2: Chopper tools from Soan, Pakistan (Left) and Pebble chopper from Machi, Manipur (Right)

ASPECT OF COMPARISON	SOAN CHOPPER TOOL	MACHI CHOPPER TOOLS
RAW MATERIAL/SOURCE	Quartzite, chert, sandstone. Discovered from riverine area.	Exclusively quartzite. Discovered from mountainous area.
TECHNIQUE / MODIFICATION/ FORM/FUNCTIONALITY	Direct stone hammer; unifacial flaking.Retains pebble cortex; minimal shaping.Asymmetrical; single working edge.Multipurpose (cutting, chopping, scraping).	Direct stone hammer; functional edge focus.Retains cortex; minimal modification.Similar form; single working edge.Multipurpose (cutting, chopping, scraping).
CHRONOLOGY	Lower Palaeolithic (1.5M–200K years ago).	Tentatively Lower Palaeolithic; uncertain date.

Table 3.1: Comparison of Soan Chopper tool and Machi Chopper tool

The Soan sites show a technique of manufacture which employs the direct stone hammer technique, which often results in the flaking of one side i.e., unifacially. The chopper tools exhibit rudimentary shaping. The tools often retain the original pebble cortex. Similarly, the Machi chopper employs the direct stone hammer technique with a focus on creating a functional edge. The ventral surface of the Machi chopper retains the pebble cortex which suggests minimal modification, which is akin to the Soan pebble-chopper tool tradition. Based on lithic tool forms and functionality, the Soan chopper tools are primarily used for cutting, chopping, and scraping. They are usually asymmetrical with the presence of a single working edge. The pebble chopper tool from Machi also exhibits a comparable functionality and form. The tools recovered from the Soan Valley are from riverine landscape, providing abundant raw materials and resources for sustenance. However, the Machi tools are recovered from mountainous and forested terrain of Manipur which suggests early human reliance on localised materials and technologies to meet their needs.

The chrono-cultural stratigraphy from the Sonian techno complex in North Western part of the Indian subcontinent is archaeologically dated to 1.5 million years ago to 200,000 years ago. These early techno complex in the subcontinent gives an insight to the early human survival strategy during the cold climates and interglacials of the Pleistocene epoch.

However, in the context of prehistoric archaeology of Manipur, the Machi sites archaeological dates is uncertain. On comparison with the Soan techno complex specially the chopper tools, the findings of a chopper tool from Manipur at Machi site can be tentatively grouped into the lower palaeolithic period. This is also in line with the use of chopper tools across northern part of the Indian subcontinent and Southeast Asia and East Asia in general. Again, the precise chronology of the palaeolithic site of in Manipur is not well established.

The pebble chopper from the Soan Valley and Machi sites have similar typo-technological tradition. These two sites from diverse ecological zones yield tools that roughly belong to the Lower Palaeolithic era. Also, the two sites represent early human ingenuity in resource utilization and adaptations. However, the Soan Valley has a clearer chronological framework. Further research and dating at Machi are essential to fully integrate it into the broader narrative of prehistoric archaeological study in South Asia.

### **Comparison of the palaeolithic tool assemblages and faunal evidences of Kurnool Cave in Andhra Pradesh with that of the Khangkhui cave site in Manipur**

#### **Kurnool Caves, Andhra Pradesh:**

In the Indian subcontinent, Caves in the limestone formation of Andhra Pradesh Kurnool district presents an ideal example of stratified faunal evidence in the form of animal fossils in association with the upper palaeolithic cultural materials.<sup>xiv</sup>The archaeological significance of the caves within the limestone region of the Nandyal Basin in Kurnool District, Andhra Pradesh, was first highlighted through the excavations of a cluster of caves known as Billa Surgam by Robert Bruce Foote and his son Henry Bruce Foote during the late 19th century.<sup>xv</sup>Recent excavations at a cave referred to as MuchchatlaChintamanu Gavi (designated as MCG I) and further investigations at Billa Surgam have corroborated Foote's earlier findings.<sup>xvi</sup>Exploratory work in the cave surroundings has uncovered open-air sites featuring blade tool assemblages and microlithic assemblages.<sup>xvii</sup> These assemblages correspond to the industries identified as Series III and Series IV by Cammiade and Burkitt (1930), which were previously discovered in the stratified deposits of the Kurnool rivers. Within the broader Indian Stone Age cultural chronology, these industries are now categorized under the Upper Palaeolithic and Mesolithic periods. Ongoing excavations by the author at a rockshelter located just 40 meters from MuchchatlaChintamanu Gavi (labelled as MCG II) on the same limestone escarpment are providing valuable insights into the occupational history of the caves and their surrounding areas.

### **Lithic tools from the Kurnool Cave MCG, Site**

The lithic tools of the Upper Palaeolithic technocomplex are notable for their diversity and functional specialization. This assemblage includes parallel-sided, pointed, and irregular blades; retouched and partially backed blades; and a small number of burins and chisel-edged core tools. Other lithic forms include side, end, and notched scrapers, as well as worked cores, irregularly worked flakes, utilized flakes, and debitage. These tools from the Kurnool cave site reflect range of activities from cutting and scrapping to intricate crafting process.

Apart from the lithic tools from the Kurnool cave site, bone tool industry primarily recovered from MCG 1 features perforators, scrapers, chisels, scoops, shouldered points, spatulas, worked bones and bone blank. The bone artifacts mentioned above shows advanced craftsmanship. The functional application include piercing, cutting, and shaping. An important aspect of the upper palaeolithic phase of the Kurnool cave site is the use of locally sourced chert and jasper cores, often quarried from the banded limestone in the area.

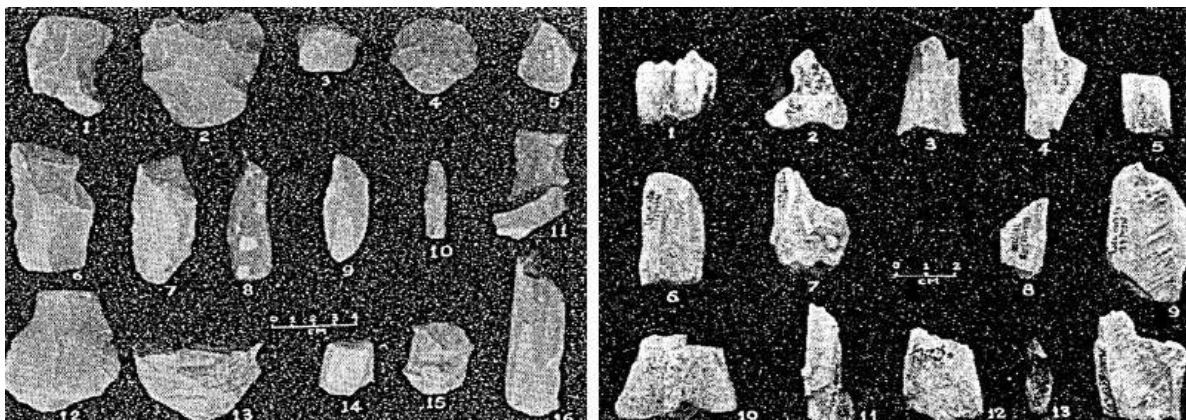


Figure 3: Upper Palaeolithic arti facts from the Kurnool cave areas. 1-2, notched scrapers; 3-4, steep scrapers; 5, burin; 6-10, blades; 11, (After MLK Murty, 1985) (Left); Bone remains from the site (after MLK Murty, 1985) (Right)<sup>xviii</sup>

### Faunal remains from the Kurnool Cave Sites

The animal or faunal remains which is discovered from the MCG 2 sites provide significant insights into the subsistence strategies of the early prehistoric hunter-gatherers. The species identified from the faunal remains include a wide range of wild animals such as the jungle cat, porcupine, black-naped hare, antelope, wild boar, pangolin, monitor lizard and birds alongside the dermal scutes of chelonia. The list of animal’s species mentioned above might have provide essential food resources for the early inhabitants of the cave site. The presence of these varied animal bones suggests diverse hunting strategy both small and large game. The cut marks from the animal bones suggest processing of these animals for food.

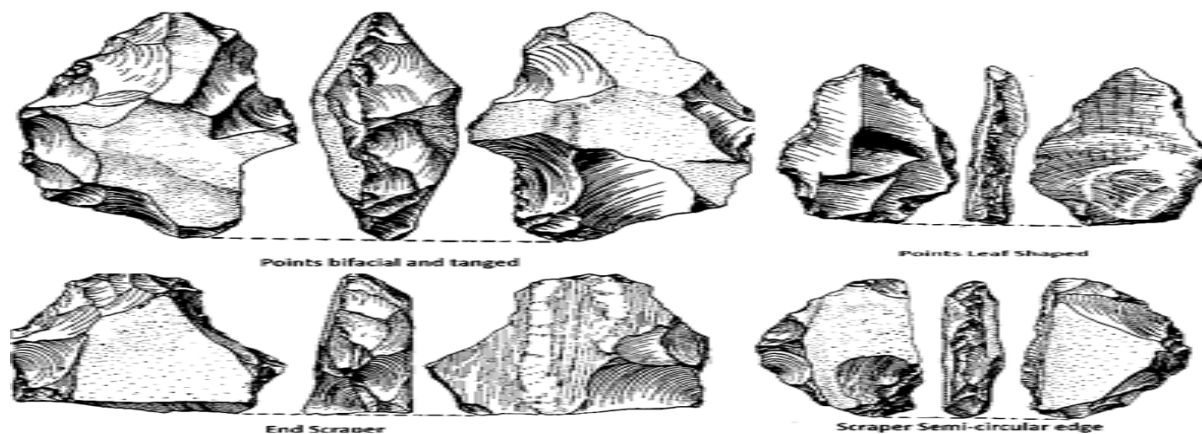


Figure 4: Points and scraper from the Kurnool sites, (H.D. Sankalia, 1962)<sup>xix</sup>

### Typo-Tool Technological Comparison of Khangkhui Cave and Kurnool Caves

The lithic tools from the Kangkhui cave assemblages are dominantly limestone (96.4%). The remaining tools are manufactured from sandstone (2.2%) and chert (1.4%). The Kangkhui cavemen employs limestone as primary raw material in fashioning the tools. In Kurnool Caves in Andhra Pradesh the predominant raw material for crafting the lithic tools comprises cherts, Jasper and limestone.

**Table 2: Comparison between Kangkhui cave site and Kurnool cave site.**

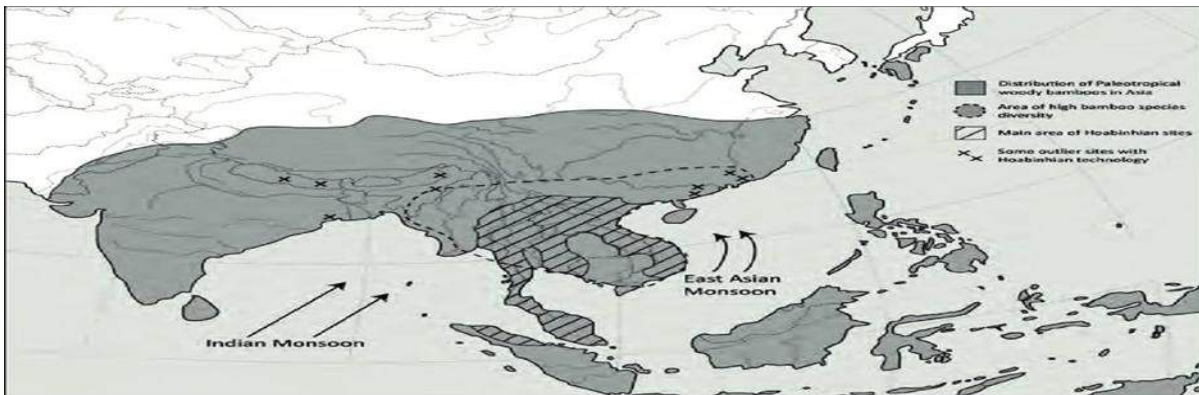
COMPARISION	KANGKHUI CAVE SITE IN MANIPUR	KURNOOL CAVE SITES IN ANDHRA PRADESH
<b>MATERIAL USE</b>	Primary raw material are limestone and small percentage of chert, sandstone.	Primary raw material are chert, and jasper. Sometime limestone are used.
<b>CORE TYPE</b>	Core type comprises discoid and tortoise core.	Reduction of core in case of blade and burin.
<b>TOOL FORM</b>	Large number of flake tools.	Consist of wide range of tools such as blades, burins, chisels, scrapers, etc.
<b>CRAFTING TECHNIQUE</b>	Levalloisian method and also advanced flaking technique were employed to fashion the tools. Use of Fire.	Retouching of the blade edge is observed. Use of fire.
<b>RELATIVE CHRONOLOGY</b>	Belongs to the Upper Palaeolithic i.e, 30,000 BCE.	From Upper Palaeolithic period to the Mesolithic period.

The palaeolithic flake tools excavated from the Khangkhui site in Manipur are produced from the discoid and tortoise cores. The observation of the flake scars on the tool surface suggests employment of advance flaking methods by the Kangkhui cavemen. On further observation of the lithic tools from the Kangkhui assemblages Levalloisian method were employed. The dominance of flake tools as compared to the core tools in the assemblage suggest sophistication in hunting activities and processing of meat and hides. In case of the palaeolithic occupation of the Kurnool caves in Andhra Pradesh lithic assemblages comprise of blades, burins, chisels, and core tools. The blades further consist of parallel sided blades, pointed blades, retouched blades, and backed blades. Additionally flakes tools of different variety are also found in the Kurnool Caves assemblage. The Kurnool lithic assemblage shows wider technological traditions as compared to the Kangkhui cave assemblage.

In Andhra Pradesh Kurnool Cave, the Upper Palaeolithic tools specially the blade employs core reduction strategies. Most of the lithic tools exhibit retouching for sharper working edges of the tools. Interestingly the evidence for chisel and burins in the assemblages shows activities beyond hunting and food gathering. The

advance tools might have been employed in crafting of other specialised tools. In terms of archaeological findings the relative chronology of the Kurnool cave site is placed at 30,000 BCE. These placed the culture of the site into the Upper Palaeolithic to the Mesolithic period. The Kanhkui cavemen also shows efficient adaptation to the locally available raw material such as limestone. The existence of the Levalloisian technique and blade technology placed the Khangkui site chronology to the Upper palaeolithic. There is also the evidence of the use of fire in both these sites.

## HOABINHIAN AND ITS CONNECTIONS IN SOUTH ASIA REGION



**Figure 5: Hoabinhian Cultural Techno-Complex (Joce White, 2011)<sup>xx</sup>**

The hoabinhian is a cultural-techno-complex specific to the both mainland and Island Southeast Asian region. These cultural techno-complex is characterised by unifacial, centripetal and circumferential cobble reduction and the resulting flakes and debitage.<sup>xxi</sup> Some of the hoabinhian tools consist of pebble tools, utilised flakes, small portion of edge-ground tools and bone tools, and in the latter period pottery and fully ground axes and adzes.<sup>xxii</sup> The sites corresponding to the hoabinhian are spread over a broad area from Southern China, North Vietnam, Malaya, Thailand, Laos, Cambodia, Sumatra, and Taiwan. This cultural techno-complex roughly coincides between late Pleistocene and early Holocene epoch and prevailed mainly in two ecological locations; rock shelter sites in Karst/riverine settings and coastal orientation. The hoabinhian techno-complex terminated shortly after the introduction of new technological artifacts such as pottery, ground adzes, etc.<sup>xxiii</sup> Besides the lithic assemblages, the probable use of wooden implements was also emphasised.<sup>xxiv</sup>

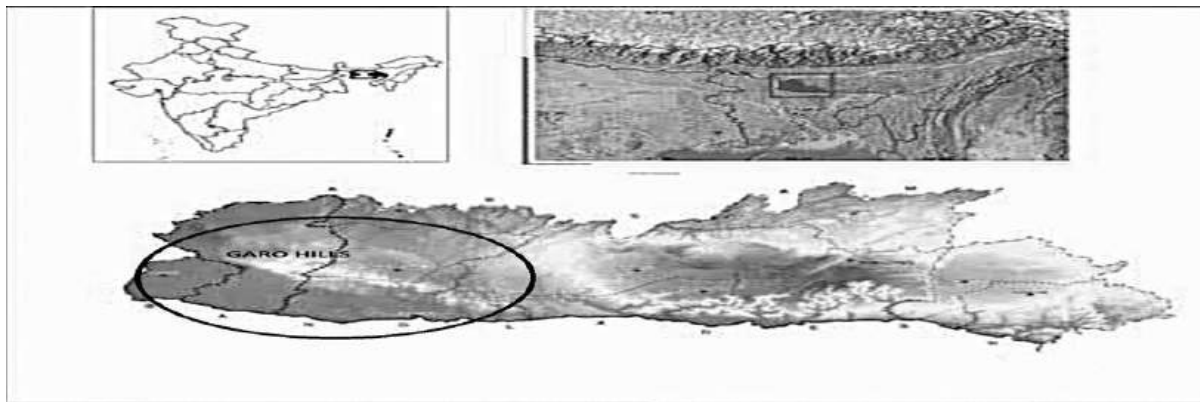
In the context of South Asia, the Northeastern India prehistoric lithic tools hold significant similarities to the Southeast Asian hoabinhian techno-complex. The Garo hills of Meghalaya at the Myr Khan, Rongram terrace site and the Tharon cave, Nongpok Keithelmanbi sites in Manipur have yielded lithic tool which are group into the hoabinhian cultural techno-complex. The Central sub-Himalayan region of Nepal, has also comparable techno-

complex with that of the hoabinhian of Southeast Asia. The rest of the Indian subcontinent have microliths assemblages and classifications of the lithic tools follows that of the European nomenclature, i.e., the Mesolithic Culture in case of the Hoabinhian culture. In the Indian subcontinent, the study and identification of the hoabinhian cultural techno-complex are still in its infancy.<sup>xxv</sup> In the present study, the comparative approach of the Tharon and Nongpok Keithel Manbi Sites of Manipur is considered with that of the Rongram terrace site of the Garo hills of Meghalaya.

**Comparative Study of the Hoabinhian cultural sites of Garo hills, of Meghalaya in Northeastern region of India with that of hoabinhian sites in Manipur**

**Garo Hills sites, Meghalaya**

*Figure 6: Map showing the Garo Hills, Meghalaya in Northeastern India*



*Table 3: Trial Trench in Rongram Site, Meghalay*

**Trial Trench at Rongram**

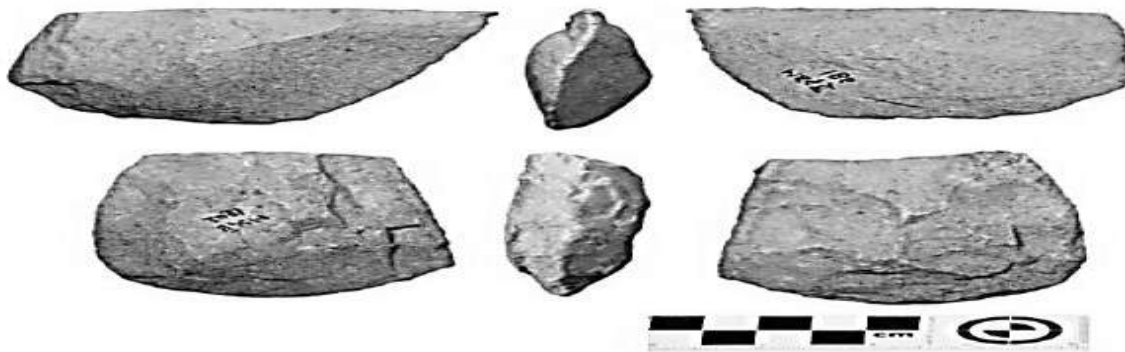
	<b>Culture</b>	<b>Material remains</b>
<b>Layer 1</b>	Neolithic	Chipped and ground stone axes
<b>Layer 2</b>	Hoabinhian	Edge ground tools, mullers

*Source: Sharma 2003*

In the context of Garo Hills, a group of prehistoric lithic artifacts were found which are made either wholly by flaking or by flaking all over and then grinding at the cutting edge. In 1977-78, excavation at the Rongram terrace site of Garo hills at an altitude about 490m asl have yielded hoabinhian artifacts at the depth of 75 cm, below 10 cm of the neolithic layer which is at the top and without any stratigraphic gap.<sup>xxvi</sup> The hoabinhian

lithic artifacts are manufactured using flattish river pebbles which are oval in shapes. The pebbles are flaked either partly or wholly. T.C. Sharma have assigned these cultural traits to late Pleistocene to early Holocene based on stratigraphy and tool typology.<sup>xxvii</sup> The chipped pebbles recovered from the Garo hill sites are comparable to the Hoabinhian cultural techno-complex of Southeast Asia. Another interesting aspect of the Garo hills is the widespread presence of short axes, which is a classic hoabinhian lithic tools of Southeast Asia.<sup>xxviii</sup> The short axes from Rongram match typically with that of Xam Trai Cave artifact of Vietnam.<sup>xxix</sup> According to Bowdler (2008), the sites which yields hoabinhian lithic artifacts and which are found associating with ground stone axes and/or grindstones are chronologically younger than the sites yielding only hoabinhian lithic artifacts in Southeast Asia.<sup>xxx</sup> Originally, hoabinhian lithic artifacts are associated with the hunter-gatherer population, however these early humans continued with this lithic tool tradition even after the adoption of agriculture during the early Neolithic phase.<sup>xxxi</sup>

On the above theory important question arises such as “Can the Hoabinhian artifacts found alongside ground stone tools of Neolithic origin in the Garo Hills be seen as evidence that the two are from the same time period? Or is this simply a case of a mixed assemblage, where artifacts from different periods got mixed over time?” However, according to Hazarika, any assumptions or corelation regarding the hoabinhian and neolithic culture cannot be accurately made at this point and it will be risky considering the problem neolithic chronology of the Garo hills region.<sup>xxxii</sup>



**Figure 7: Short axes, distinctive hoabinhian tool from Garo Hills, Meghalaya (Sharma, 2002)**

Recent research on culture within a culture by Ashraf (2010) taking a fresh approach, the study tried to explain the lifestyle and survival strategies of groups, especially the Hoabinhians in Meghalaya. It focused on how their behavior, including technology and economy, shaped their way of life, rather than attributing it to population growth or the sudden arrival of new technology.<sup>xxxiii</sup> The so-called Hoabinhian industry reported from Northeast India should be understood as a unique manifestation of the region and hence should be explained on its own

terms, culturally and technologically. This form of industry also needs to be addressed based on the functional utility of the tools. Evidence from the site of Myrkhan clearly reveals that the so-called short axe technology, one of the characteristics of the Hoabinhian, survived well ahead into the advance stage of the Neolithic phase. Resemblance of the tool types may not directly suggest a continuity of tradition but an easily learnt technological tradition on a natural resource (river cobbles) widely available in upland river drainages and used with diverse subsistence strategies in varied environmental zones (see White 2011).

**Table 4: Important sites yielding hoabinhian cultural techno-complex in Garo hills, Meghalaya**

SL. NO	NAME OF THE SITE	LOCATION	SIGNIFICANT PREHISTORIC ARTIFACTS	SOURCE
1	Bibragre (Bibragiri)	West Garo Hills	Hoabinhian tools	Ashraf 2006
2	Ganolgre (Ganolgiri)*	West Garo Hills	Neolithic axes, adzes, grinding stones, potsherds (handmade and pale grey), Hoabinhian tools	IAR 1971-72
3	Matchakolgre (Matchakolgiri)*	West Garo Hills	Neolithic axes, adzes, grinding stones, Hoabinhian tools	IAR 1966-67
4	MakbilBisik	West Garo Hills	Hoabinhian tools	Ashraf 2006
5	a) Rongram b) Rongram Terrace	West Garo Hills	Neolithic axes, adzes, grinding stones, potsherds together with Hoabinhian tools (sumatraliths) Edge ground tools, chipped pebble axes of Hoabinhian tradition and a large pounding stone	IAR 1966-67, IAR 1971-72,

**Manipur**

In the context of Manipur, the hoabinhian techno-complex are in the NongpokKeithelmanbi L1 site and the Tharon Cave site. The hoabinhian lithic industry in the NongpokKeithelmanbi L1 site is centered around pebble tool tradition. These lithic tools are usually crafted from quarzitic sandstone and includes chert artifacts. They are produced by direct percussion techniques. The pebble tools working edges are produced by striking one or both ends of the pebble while retaining the original shape. Different types of the pebble tools include, the chisel edge tools which is formed by intersecting flakes and round edge tools which is formed with steep flaking for smooth curves. Another pebble scraper featured secondary flaking to produce the tool whereas split pebbles, often with blunt edges, suggest use in pounding or scraping tasks. Flake tools is another significant tool which are fashioned from pebble cores and retains the natural cortex of the pebble. The bulb of percussion is easily identifiable in these flake tools. The lack of retouching of these flake tools is another identifiable trait. In the NongpokKeithelmanbi L1 site lithic tool assemblages, a chert blade with mid-ridge and side notch represents a

specialised tool within the Hoabinhian toolkit. The Tharon cave site lithic assemblages highlight the Hoabinhian pebble tool industry which primarily utilised sandstone pebbles collected from nearby streams. Grinding, flaking techniques or combination of both are used to shape the tools retaining portion of the natural cortex. The lithic tool variants from the Tharon cave site include chopping tools, handadzes, handaxes, pointed tools, scrapers, edge-ground knives, querns, and grinders. These tools were produced using unifacial and bifacial techniques. The chopping tools are manufactured from thick pebbles which is grounded on one side to create a sharp working edge, while the other side remains convex. Handadzes tools were shaped using flat pebbles and the unibeveled cutting edges are formed through grinding and light flaking. The tools were used in chopping or woodworking. Handaxes tools were manufactured by removing thin flakes from the core. Pointed tools which is ground at the narrow ends and along the side were likely used to pierce objects. Scrapers tools were formed by grinding or flaking and the resultant concave edges were likely used for scraping or scooping task. The edge ground knives which are grounded alternatively on the longer edges were likely served for precision cutting and slicing of objects by the early humans. Another interesting tool from the Tharon cave site are the quern and grinder. They were likely used for food processing and highlight one of the advanced utilities of the Hoabinhian tool set from the Tharon cave site. Quern is a rectangular sandstone slab which can be used with the elliptical shape grinder to process seeds or grains.

Therefore, the Tharon cave site lithic assemblages reflect resourcefulness of the Hoabinhian tool techno-complex. The early humans adapt to the available raw material such as pebble or cobble tools to meet diverse functional needs. The grinding and flaking techniques demonstrate an efficient and practical approach to tool making which is akin to other Hoabinhian sites in Southeast Asia.

### **Comparison of the Hoabinhian lithic tools assemblages from Garo hills, Meghalaya with that of Hoabinhian tools from Nongpok Keithelmanbi L1 and Tharon cave site in Manipur**

The Hoabinhian cultural techno-complex is characterised by unifacial, centripetal and circumferential cobble reduction which yields a variety of pebble tools, edge-ground implements and flake artifacts. The cultural techno-complex spread across mainland and island Southeast Asia. Important sites which are associated with the Hoabinhian techno-complex are typically located in karst or riverine environments and coastal areas. It reflects the adaptation of the early humans during the late Pleistocene and early Holocene epoch to diverse ecological zones. In South Asia region especially the northeastern part of India the Garo hills sites in Meghalaya and Tharon and Nongpok Keithelmanbi sites in Manipur showcase Hoabinhian techno-complex in consonance with Southeast Asian prehistoric sites. In Garo hills Meghalaya, the Rongram terrace site have uncovered Hoabinhian techno-complex.

The tool assemblage consists of flake pebble, chipped axes, and short axes. These tools are fashioned from river pebbles or cobbles. Partial or complete flaking of the river cobble is the only form executed to produce the tools. These tools are in comparison to the Mesolithic tool complex are very rudimentary. A significant find of archaeological importance from the Rongram terrace site is the short axe which is a classic hoabinhian tool found all over Southeast Asia. These might have been diverse tools set might have been employed in different activities for subsistence such as cutting, pounding and processing of plants and meat. The hoabinhian techno-complex from Garo Hills Meghalaya are found in association with the neolithic artefacts such as fully ground axes and pottery fragments. Coming to the Tharon Cave site in Manipur which also yields hoabinhian cultural techno-complex. The lithic assemblage comprises pebble or cobble tools, handadzes, handaxes, pointed tools, scrapers and grinders. These tools are fashioned by grinding and flaking methods. Similarly, the hoabinhian site of Nongpok Keithelmanbi L-1 showcase pebble tools. These tools were fashioned from grinding and flaking methods as also in the case of Tharon hoabinhian tools set.

In comparing the tool typo-technology from the Meghalaya Rongram terrace site and hoabinhian site of Tharon and Nongpok Keithelmanbi L-1. The two different regions in northeast India employ similar river pebble or cobble tools. Stream beds as primary source in case of Tharon pebble tools in Manipur. The hoabinhian techno-complex from Meghalaya Garo Hills fashioned the tools through flaking. However, in Manipur hoabinhian sites the tools were fashioned through flaking and also employ grinding technique. The grinding technique is used in the creation of edge ground tools. In tool types and functions the Garo hill sites yielded distinctive short axes which is a classic hoabinhian tool of the Southeast Asian sites. In Manipur broader hoabinhian tool types were included such as scrapers and grinders. Based on the tools it also suggests a more diversified subsistence strategy. Technologically, the Garo hill sites suggest a potential overlap of Hoabinhian and Neolithic cultural traditions which is observed in stratigraphic layers containing mixed artifacts. These show the existence of older technologies alongside newer innovations in Garo hill sites. Whereas in Manipur, the lithic tools while resembling the Southeast Asian lithic assemblages also show local adaptation such as the emphasis on grinding techniques and multipurpose tools like grinders and scrapers.

In Northeastern India, the hoabinhian techno-complex is represented by a regional adaptation of the larger Southeast Asian cultural traditions which is shaped by its local environments and subsistence strategy. The prehistoric archaeological sites of Garo hills and Manipur exhibit similar features and also differences with unique regional developments. However, further research is important to establish chrono-cultural sequence and functional dynamics of these lithic assemblages. This research will help to unravel the continuity or transformation of lithic tradition within the region.

## NEOLITHIC ARTEFACTS EXPLORED AND EXCAVATED FROM DIFFERENT SITES FROM NORTHEAST INDIA

The neolithic culture of Northeast India forms a distinct identity in the Neolithic cultural tradition of India. E.C. Worman, V.D. Krishnaswami and B.K. Thapar classified the Neolithic cultures of India. Whereas A.H. Dani, T.C. Sharma and O.K. Singh discussed the issue of Northeast in a broad spectrum and added more dimensions in solving the neolithic problem of Eastern India. In the present research, an attempt has been made to highlight the vast repertoire of stone tools and pottery from different states of Northeast and their position in the neolithic status of Eastern India. In the context of Northeast India, Neolithic sites are discovered from the state of Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim, and Tripura. The Neolithic cultural phase in this region showcase similarities with that of Southeast Asian sites and also distinct cultural and technological phase of local origin.

The prehistoric archaeological potential of the northeastern region considering its geography and paleoenvironmental potential have been known to the scholars only in recent times. The neolithic subsistence pattern which include early agricultural practice, pottery manufacturing, and animal husbandry were not yet fully represented. Earlier research on the Neolithic phase of the region focuses on the neolithic stone tools typology and earthen ware potteries. However modern research in the area of phytolith and carbonised grain analysis have recently showcased the transition from wild rice cultivation to its domestication during the Neolithic period. British scholar J.H. Hutton for the first time takes into Neolithic research in Northeast India in 1928. It was later followed by K.L. Baruah in 1939. Baruah analyse the different neolithic celts from the sites of Darrang and Cachar district of Assam. He also undertakes comparative approach with that of neolithic celts from Burma and the Chotanagpur region. Another scholar E.C. Worman in 1949 had undertaken studies on neolithic period in the region and he concluded that the stone tool industries had similar cultural affinities with that of Southeast Asia. The neolithic interpretation of the above scholars were challenged by A.H. Dani and V.D. Krishnaswami. They studied and highlighted regional variation in the lithic tools and also attributed the unique technique of production to geographical factors. The tools are often produced from flat slabs of stones which are procured from stream beds. The tools required minimum chipping. They were predominantly relying on hammering and grinding techniques. V.D. Krishnaswami categorized the neolithic tools industry of Northeast India into six different zones. They include Cachar Hills, Sadiya Frontier, Naga Hills, Khasi Hills, Garo Hills and the Brahmaputra Valley. The different tool typology classified by V.D. Krishnaswami includes faceted tools, shouldered tools, splayed axes, rounded butt axes with broad cutting edges, wedges, and grooved hammerstones. Based on his analysis the neolithic tool industry of the region shows similar cultural affinities from Southeast

Asia. This analogy is supported by the discovery of specific tools and black polished ware which are also found in Southeast Asia. Another renowned scholar T.C. Sharma have furthered the knowledge of the Neolithic culture of Northeast India. He emphasises a strong cultural affinity with that of Chinese and Southeast Asian traditions specially the Hoabinhian cultural techno complex. Interesting findings from the neolithic sites of DaojaliHading shows cobble tools and ground stone adzes overlapped with the pottery layer which is very similar in the context of Southeast Asian stratigraphic findings. The geographic terrains of Northeast India are mostly hilly and the neolithic settlements were usually located in the upland areas. It is in contrast with that of the neolithic sites located in South Asia region where the sites are located in the riverine setting. Recent trends in the prehistoric archaeological research of the region undertaken by Universities and State Archaeological Departments have continue to uncover mysteries into the genesis and growth of Early farming communities in different parts of Northeast India. Despite this traditional attempt in the archaeological studies, there is also a need to focus on the other advanced methodologies and integration of ideas from different scientific subjects to holistically understand the past neolithic societies of the region. For instance, the in cooperation of palaeobotanical studies will enable better understanding of the transition to agriculture and the significant role played by the region within the larger framework of South and Southeast Asia.

**Table: Lists of Neolithic artefacts and ceramic evidences from different Northeast Indian Sites**

REGION	SITES	TOOL TYPES AND OTHER ANTIQUITIES	POTTERY
MANIPUR	Nongpok Keithelmabi	No stone tools from excavation, but ground celt from adjoining areas	Ill-fired and handmade pottery with corded surface in linear and criss-cross patterns
	Napachik	Pebble and flake tools, ground celts, some of the flake tools are very small and resemble non-geometric microliths, grinding stones	Plain ware, cord-marked ware, ring footed ware, tripod legs ware
ASSAM	DaojaliHading	Edged tool, grinding stones, querns, mullers	Cord-impressed variety, stamped dull red variety, and brick red variety
	Sarutaru	Ground stone celts	Cord-impressions or basket-impressions on the exterior of the pottery of brown, buff and grey colour
	Marakdola	Shouldered celt	Wheel turned pottery of fine kaolin clay

<b>MEGHALAY A</b>	Selbalgiri 2	Ground and chipped stone axe, scraper, microliths, both geometric and nongeometric	Handmade grey colour pottery
	Pynthorlang tein	Adzes, axes, chisels, points, blades, scrapers, polishers, penknife, flake-blanks, cores and flakes	Coarse red ware pottery with cord-impression
<b>ARUNACHAL PRADESH</b>	Parsi-Parlo	Pecked and ground stone tool	Square-grid, honeycomb (web) and beater impressed pottery
	Daporijo	Neolithic axe	

**Table: Ceramic types from three important sites of Northeast India (Hazarika, 2006)**

<b>NAME OF THE SITE</b>	<b>TYPES OF CERAMIC</b>	<b>REFERENCES</b>
DaojaliHading of Assam	Cord-impressed pottery, Incised pottery, Stamped pottery, Plain Fine Red Ware	Sharma, 1967
Kamla Valley of Arunachal Pradesh	Plain coarse ware, Cord-impressed Coarse Red ware, Stamped (square grid) Buff ware Grooved, Coarse/Fine Buff ware, Plain Brown ware	Ashraf, 1990
Phunan Hills of Manipur	Plain ware, Stamped wares, Incised wares, Cord-impressed wares, wares with circular spots and Applique wares.	Singh,1993

**Table: Some radiocarbon dates reported from various neolithic sites of Northeast India (Hazarika, 2012)**

<b>SL/NO</b>	<b>STATE</b>	<b>SITE</b>	<b>LAB N</b>	<b>C 14 DATES</b>	<b>REFERENCE</b>
1	Manipur	NongpokKeithelmanbi		4,460 + 120 years BP	Singh 1993
		Napachik		1450 BCE	Singh 1993
2	Assam	Dibru valley		2210 + 140 BCE	Saikia 1988
		Kanai Gaon Reserve	PRL 1234	1440 + 80 BP	IAR 1992-93: 118
3.	Tripura	Haora and Khowai river valley		1500 BCE	Ramesh and Rajagopalan 1999: 13-30

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