PART - 2

STUDIES ON PALAEOCHANNELS
AND PALAEOENVIRONMENT
CHAPTER - 2.1

HISTORICAL RECONSTRUCTION OF THE MEENACHIL RIVER BASIN WITH SPECIAL REFERENCE TO THE ARCHAEOLOGICAL EVIDENCES FROM THE WEST COAST

2.1.1 INTRODUCTION

One of the important aspects relates with the study of palaeohydrology is the reconstruction of the historical scenario of the region through published and unpublished reports, hints depicted in literatures, human documentation on palaeohydrology like high water marks and interviews. Such documentation is found relevant in the present study as the Keralites had always been known as maritime people (Gurukkal, 1999). It is recorded that the early overseas trade started with the export of ivory, peacocks, monkeys, teakwood, sandalwood etc. to the Middle East from the time of King Solomon. Later on, foreign trade continued with Rome till the fall of the Roman Empire. During this period Kodungallur was the commercial and political capital of Kerala. The present study is designed to document the historical references of the Meenachil river basin with special attention to the archaeological evidences from the West coast on sea level oscillations.

2.1.2 OBJECTIVES

1. To give a brief outline on the evolution of the Kerala coast.
2. To portray the archaeological evidences from West coast in relation with the historical sea level oscillations.
3. To document the historical references on Meenachil River basin.

2.1.3 METHODOLOGY

The work envisaged under this chapter has been fulfilled by drawing relevant remarks on (1) the evolution of Kerala coast, (2) evidences of past sea level oscillations along the western coast as well as (3) ancient documents on the Meenachil river basin. It has been designed to accomplish by collecting literatures having annotations on ancient Meenachil River, archaeological evidences and scientific publications on the glaring incidents on the western coast and interviewing the inhabiting people to familiarize the hearsays about the River and culture.
2.1.4 REVIEW OF LITERATURE

A. Evolution of Kerala coast: some observations

Kerala, which is geographically located at the south-western corner of the Indian Peninsula, spreads over an area of 15,000 square miles. It is suggested that the western coast of India had subjected a block faulting along N-S direction and the block, which plunged into the Arabian Sea would have displaced more than 1000 metres away. The age of this faulting is suggested to be contemporaneous with the Post Deccan Trappean (between Late Cretaceous to Eocene). A study conducted by the Marine Survey of India in order to formulate the characteristic feature of the Continental shelf of Western coast revealed that the continental shelf region of the western coast has an average width of 45 km and at a depth of 49.3 fathom, the continental shelf changes into continental slope. The salient features of the western coast of Kerala are as follows:

<table>
<thead>
<tr>
<th>Profile</th>
<th>Depth at which continental shelf meets continental slope (Fathom)</th>
<th>Width of Continental shelf (Km)</th>
<th>Angle of inclination of continental shelf</th>
<th>Angle of inclination of continental slope</th>
</tr>
</thead>
<tbody>
<tr>
<td>Western Coast, India</td>
<td>49.3</td>
<td>45</td>
<td>0°7'</td>
<td>0°57.5'</td>
</tr>
<tr>
<td>World average</td>
<td>72</td>
<td>67</td>
<td>0°7'</td>
<td>4°15'</td>
</tr>
</tbody>
</table>

Source: Rao, 1974

It is remarkably noticed that the angle of inclination of the continental shelf of western coast is equal to that observed throughout the world. According to Daly (1942), the continental terrace is unique geographical unit composed of continental shelf and continental slope. It is also suggested that since the coast line is temporary and non-static, the continental shelf and its adjoining areas can be considered as a single unit. Besides, the continental terrace is characteristically more related to continents than the oceans.

There are two views about the formation of the continental terrace.

1. Obviously the sediments are controlled by wave-base. Hence the continental terrace can be considered as wave-built terrace.
2. The continental terraces are formed due to the degradational processes. It is assumed that the continental shelf is being subjected to erosion, what exactly seen at a mountain face and the sediments thus formed are deposited at its open end.

Many scientists have suggested the influence of glacial rivers, especially in erosion of the continental regions and abrasion of oceanic regions, in the evolution of the continental shelf. It is also suggested by Daly (1942) and Rich (1950) that the continental terrace a wave built one and due to the accumulation of the sediments and colloids over the continental slope, it extends towards the interior deep sea. But
Shepherd (1948) suggested that the continental terrace could be formed by different ways. He also believed that the continental slope is mainly formed due to faulting and the continental shelf is formed by wave erosion. Kuenen (1950) proposed that the continental shelf is formed by up-building process, which resulted due to the deposition of fore-set beds followed by top-set beds on a depository base. Dietz and Menard (1951) suggested four factors such as (1) formative tectonics, (2) internal structure and composition, (3) Erosional and sedimentary processes acting on it and (4) Intensity and duration with which they act upon. He also suggested that the landforms, even though they are not inter-related, exhibited at the continental terrace are according to the geomorphological cycle, especially developed during the Youthful stage, Mature stage and Old stage. According to the above facts, the possible evolution of the western coast as inferred from the sedimentological characters at near-shore, estuary and off-shore regions can be schematically represented as modified after Rao, (1974) in Fig. 2.1.1.

![Fig. 2.1.1 Schematic diagram showing the evolution of western coast (modified after Rao, 1974)](image-url)
B. Kerala: Scientific evidences for neo-tectonism

Vaidhyanadhan (1971) reported that Kerala coast indicates filling up of a series of bays with mud during the Holocene and later covered by sand and that radiocarbon dating of one such emerged areas has given a date of 4460 B.C. From the occurrence of peat sequence in the sediments in the low-lying area around Vembanad Lake in Kottayam district, a submerged forest has been suggested in this area.

According to Soman (1997) in his study related to the evolution of Kerala coast, Radiocarbon dating of lime shells from Payyannur (on land) yielded ages of 4370 ± 100 and 4490 ± 90 years. Peat from Tellicherry and Tannissery gave ages of 7230 ± 120 and 6420 ± 120 years, respectively. This indicates that the area lying between Payyannur and Tellicherry/Tannissery was uplifted to the present level from an estuarine environment quite recently, and naturally not earlier than about 4000-7000 years from present. Such uplifted segments during 4000 YBP are seen near Rameswaram, Kanyakumari etc. in the coastal tracts of south India. This suggests that uplift ca. 4000 YBP was a very prominent Neotectonic/eustatic event in the southern coastal stretches of peninsular India.

C. Sea level oscillations during the Holocene: Historical evidences from other parts of India.

Examples from archaeological sites belonging to the Harappan period such as Lothal, Padri, Bet Dwarka and others have been cited to indicate shoreline movement in relation to the last 4500 years. Excavations at Lothal have brought to light a Persian Gulf seal, terracotta models of African mummy, guerrilla and boat model, demonstrating the maritime practices and relations with Mesopotamia and Egypt between 5000 and 4000 years BP. There is a massive brick structure identified as dockyard, and some stone anchors found in the vicinity suggesting that Lothal was an important maritime Harappan trading centre. Lothal, therefore, can be considered as a clear evidence of offshoreward movement of shoreline. Indications from other archaeological sites are also discussed to configure shoreline movements during the last 4000 years or so (Gaur and Vora, 1999; Gaur, 2000).

The study of former shorelines is of considerable importance to a variety of disciplines. The changes in shoreline directly affect the dawn and devolution of civilization along the coast. Archaeologists have long been aware that in the past, the coastline had been a focus for man’s activities and thus archaeological sites can be one of the most promising indicators of former shorelines, particularly of the late Quaternary period. Several submerged prehistoric sites off the coastline of France, California, Israel and Greece have been useful in tracing the shoreline. In India, particularly on the Tamil Nadu coast, several Palaeolithic sites are situated on the terraces at 73 m, 45 m, 30 m and 17 m above MSL formed...
by fluctuations of the sea-level (Sankalia, 1974). Early Palaeolithic tools were found at 45 and 30 m while middle Palaeolithic tools were noticed on 17 m terrace. Several Mesolithic and Neolithic sites are located along the coastal belt of India and there are ample evidences of the exploitation of marine resources. Similarly, Gujarat on the west coast of India has several sites which witnessed extensive maritime activity during the Harappan period (3000–1500 BC). There are several direct and indirect references in Ancient Indian literature about the behaviour of shoreline which significantly affected the coastal human settlement (Gaur et al., 2007).

It is now generally agreed that glacio-eustatic sea-level stood higher than the present in and around 6000 years BP (Gupta and Amin, 1974; Pirazzoli, 1991; Rao et al., 2003). During the mid-Holocene, the Indian Ocean witnessed the rise of three major civilizations of the world namely, Mesopotamian, Egyptian and Indus Valley. One of them emerged in the Indus–Saraswati Valley (popularly known as the Harappan civilization) and developed in full scale. Archaeological evidences such as settlements on the islands and exploitation of marine resources from Kachchh suggest that the maritime activities began a little earlier than the Harappan civilization. A group of people migrated from the Sind area called Amari culture, to Kachchh around 3000 BC and settled in northern Kachchh area. Several sites of Indus Valley Civilization are within 20 km from the present shoreline. These are believed to be the ancient ports or centres, busy in exploiting the marine resources and clearly suggest migration of shoreline. Several studies have reported changes in sea-levels and shoreline migration with special reference to the Gujarat and Maharashtra coasts (Agarwal, 1973; Merh, 1987), and suggested a sea-level during mid-Holocene period between 2 and 6 m higher than the present. Much of the evidence has been based on $^{14}$C dating and morphological features and lithologies. The archaeological data have also been corroborated with sea-level changes, sedimentation and tectonic activity from the Gujarat coast.

A few archaeological sites showing direct or indirect connection with shorelines have been selected and examined in detail with respect to the present shoreline. Explorations in Okhamandal were undertaken to collect information on the submergence of Bet Dwarka island. A few sites were located in inter-tidal zone. Apart from Okhamandal, a few other Harappan period sites on Gujarat coast have also been selected, which show evidence of port installation, exploitation of marine resources like conch shells, marine fishes or production of salt, etc. as indicators of palaeo-shorelines. As of today, these sites are located away from the present shoreline.

Lothal, believed to be the oldest dockyard in the world, is located at the head of the Gulf of Khambhat, now situated about 23 km away from the shoreline and about 12 m above the mean sea-level, on the
left bank of river Bhogawa. A massive brick structure measuring 213m x 36m at Lothal is identified as a
dockyard and some stone anchors in the vicinity suggest that Lothal was an important maritime trading
centre. Moreover there are evidences of marine salinity in the soil of the tank (Nigam, 1988). Boats
might have been reaching the dockyard through a channel of the river Bhogawa and Lothal must have
been one of the major Harappan trading centres. Lothal, thus provides a clear evidence of southward
shifting of shoreline by about 23km. A recent study in the valley of Mahi river suggests that seismic
events had taken place between 3320 ± 90 and 2850 ± 90 year BP which may have played a major role
in the evolution of the Mahi Basin in particular and Gujarat alluvial plains in general.

Padri is another recently excavated site by the Deccan College, Pune. It is located in the Gulf of
Khambhat about 60 km south of the Bhavnagar port and just 1 km away from the shoreline. According
to the excavating team, the site belongs to a fairly mature Harappan period, datable to 2200 BC
(Shinde, 1992). There are numerous evidences of exploitation of marine resources at this site. One of
the major findings is a large Harappan copper fish hook, which is 14cm long with barbed point and loop
on the other end and weighs 45g. It is in a very good state of preservation. Such large fish-hooks were
probably used to catch large marine fish weighing more than 50kg. This indicates that the Harappans of
Padri had perhaps mastered the technique of deep sea fishing. It is logical to presume that, for this
purpose, they also used a big boat. The excavator of Padri site also inferred that the people there were
producing salt and supplying it to the surrounding Harappan settlements.

Dholavira is yet another Harappan site located in the Great Rann of Kachchh on a Khadir Bet. At
present the Rann is a dry area but during good monsoon it gets flooded. Dholavira is supposed to have
witnessed the earliest habitation of proto-historic period in Gujarat. Excavation has revealed a long
cultural sequence which commences from the beginning of the third millennium BC, when perhaps a
group of people from Makran coast arrived on the island through Kori creek. This assumption is based
on the ceramic feature resembling those from the Amerian culture (datable to 3000 BC). Similar pottery
has also been reported from other Harappan sites of Kachchh. The base of Rann of Kachchh might
have been under 10m deep water for 3000 years and the Khadir Bet could have served as an island in
the shallow sea (Merh, 1995). It is not clear why people settled on an island rather than on the
mainland, where agriculture and other commodities, including marine resources could be better
exploited. The inference is that Dholavira was an active port and the Harappans must have found that
this port was a safe harbour for anchoring boats. The long habitational history of the area highlights the
importance of the location and of maritime activities. The location of the site seems to be favourable
even for riverine navigation, in case one is not inclined to consider this a port site.
Kuntasi is another site locally known as Bibino Timbo located about 3 km south-east of the Kuntasi village. It is about 5 km inlandward from the present shoreline. A large stone structure measuring 9.5m x 4.1m outside the fortification, according to Dhavalikar et al. (1996), was used as landing platform for going down to the creek for loading-unloading cargo in boats. They further suggested that it was not an agricultural settlement but was a centre for acquiring and processing raw materials for manufacturing articles for export. Discovery of two cylindrical stone anchors with tapering sides, and large holes bored vertically throughout the length and the overall geomorphology of the area corroborate that Kuntasi could have been a port situated at the creek mouth during the Harappan period. Excavations at Malvan in south Gujarat suggest that this was a post-Harappan estuarine port, dating back to 1400 BC. The site was located on the banks of an oxbow lake formed by the Dumas branch of the Tapti river. Studies of sediment samples from this lake suggest that during the post-Harappan time tides would have been two and a half m above the dark grey clay bed (Allchin and Joshi, 1995).

Shifting of shoreline due to one or other reason is not a new phenomena. A few Harappan sites along the Makran coast must have served as sea ports during the third millennium BC and now these sites are located as far as 30 miles inland. These displaced ports reveal that the coastline in this part of Pakistan had risen considerably during the past 4000 years. Similarly, several workers have demonstrated that the sea-level was higher than the present around 6000YBP (4000 BC) at the Saurashtra coast as well. In view of this, it can be surmised that the above-mentioned archaeological sites on Kachchh and Saurashtra coast, which happened to be contemporary, had been connected with maritime activities, and therefore, can also be used as indicators of palaeo-shorelines for the region between 3000 BC and 1500 BC. However, it is also necessary to discuss other geological aspects connected with this.

Archaeological evidences suggest that the behaviour of shoreline was different at different places. Lothal is located about 26 km from the present shoreline and about 12 m above the MSL. The gulf is narrow and a few major rivers debauhch here such as Narmada, Tapti, Mahi, Luni, etc. Offshore currents are also responsible for depositing the sand in the Gulf, ultimately resulting in the shallowing of the Gulf. Earlier studies mentioned that the Gulf of Khambhat and the Gulf of Kachchh were connected during the early mid-Holocene period. Bruckner (1989) had suggested that the river-generated sediments may have played a vital role in the seaward movement of the shoreline. The Great Rann and Little Rann are unique examples of Holocene sedimentation. The two Ranns represent filled-up gulf and mark the site of accumulation in an estuarine delta environment that was marked by a fluctuating strandline since the advent of Holocene. Gupta (1977) mentioned that ‘Holocene sediments of the Little Rann and Nal Lake were contemporaneous’. The lowermost sandy clay horizon extends from about 9000 BP to about 4200
BP overlain by the silty clay horizon dating from 4200 to 1500 BP and then again by the most recent silty clay horizon. He further suggested that even as late as 2000 years ago, Little Rann was about 4 m deep and thus was inundated throughout the year.

Another important factor of shifting of the shoreline may be due to tectonic effect. Recent studies on sea-level changes clearly suggest that neotectonic activity had also played a vital role in sea-level fluctuations, particularly in Saurashtra and Kachchh region, during the Late Pleistocene/Holocene. Studies on sea-level along the Mumbai coast suggest that until 8300 BP shallow sea-level conditions prevailed on the carbonate platform located at about 80–90 m depth off Bombay and this is in contrast with the glacial eustatic sea-level position which was at about 22 m at 8300 years BP (Joshi and Bisht, 1994). There are also evidences of earthquake from Dholavira in Khadir Bet of Rann of Kachchh which may be datable to around 2200 BC. Perhaps the effect of earthquake such as collapse of houses and diversion of drainage system, and finally the uplift of Rann were responsible for the decline of Harappans at Dholavira. There are evidences of navigation in the Rann of Kachchh during the historical period. The author of *Periplus of Erythraean Sea* writes ‘Beyond the river Sinthus there is another Gulf, not navigable, running in towards the north; it is called Eirinon; its parts are called separately the small Gulf and the great; in both parts the water is shallow, with shifting sand-banks occurring continually and a great way from shore; so that often when the shore is not even in sight, ships run aground, and if they attempt to hold their course they are wrecked’ (Mc Crindle, 1987).

The sea level was not constantly withstanding during the recent geological past. The earlier works suggested that up to 4th century AD, the sea level was lower than the present one. These evidences are in agreement with many other archaeological sites situated along the Indian coasts such as Poompuhar, Mahabalipuram, etc. (Gaur and Sundaresh, 1998; Sundaresh et al., 2004)

Observations from the archaeological evidences are summarised as follows:

1. Sea level was higher than the present one at around 6000 YBP and remained there until 3500 YBP or so., as a result, a large number of Harappan port towns in Gujarat and Pakistan are now located inland, far away from present-day shore line and at a higher position than the present sea level. Similarly a late Harappan site datable to3800 YBP in Bet Dwarka is located about 4m above the high waterline.

2. Sea level continued at the present state from 3500 to 2300 YBP, as an early historical period site at Bet Dwarka dated to 2600 – 2300YBP is situated a little higher than the present high waterline. Similarly, a well-known early historical port town at Sopara, North of Mumbai was an active port and had international trade relations (Ghate, 1988).
3. After 2300 YBP, the sea-level fell by 2 to 3m along the Bet Dwaraka coast, as the oldest habitations are located below the present sea level. And perhaps around 10\textsuperscript{th} century AD, the sea level reached the present state and then number of ports came into existence along the Gujarat Coast.

D. Historical references of Kuttanad and Meenachil River Basin

The development of the Indian ocean and the geologic history of the India’s west coast continental margin started with a line of weakness (mega shear) separating what is now India and Madagascar that fractured rocks within the Gondwana super-continent affected by the Pan – African orogeny. Prolonged dextral trans-tension across this zone from earliest Cretaceous to Turonian times (~ 140 to 90 Ma) led to a zone of extended crust with some continental content, created southward movement of India away from Madagascar. Most of these extended crustal material remains with India, even today. At about 89Ma, India started rapid movement northwards. A multiplicity of mid-ocean ridges and ridge-jumps characterizes the post-89Ma development of the ocean crust between India and Madagascar, but these can be explained with a minimum of hypothesis (Reeves and Leven, 2001).

Geologists have advanced a hypothesis that there was a great land bridge once connected India and Africa. The abrupt array of the mountain ranges that separate the ocean and the subcontinent suggest that land subsidence on a vast scale once took place here. Many, like Wilhelm Geiger and Alexander Kondratov, have the opinion that the whole subcontinent was a vast flat chunk of land left over from a land mass whose western part sank into the ocean, while island of Ceylon, in its turn, was also a part of the sub-continent (Nair, 1986). Scientists have established that during the last 1,00,000 years, there were 5 cataclysmic changes in Gondwanaland region as a result of which, large parts of the land sunk under the sea and South America and Africa were separated. The landmass which sank was called Lemuria. When the large parts of Lemuria sank, rest of the landmass started moving northward and formed the present day Indian sub-continent including Ceylon. The last cataclysmic change, which is said to have taken place at about 2700BC is recorded in the Tamil literature (Mahalingam, 1980). According to Menon (1997), one of the theories relating to the origin of Kerala focuses attention on the geographic aspect. Cher or Chernta means “added” and Cheralam (Sanskritised as Keralam) means the land that was added on to the already existing mountainous country. In other words the traditional land of Kerala was a reclamation or addition to the land from the Arabian Sea.

Thampatti and Padmakumar (1999) narrated that there are two types of vision among the scientists regarding the evolution of the Kuttanad region. One such opinion suggests that the Kuttanad region was once a part of the shallow coastal area of the Arabian Sea. As a result of a geological uplift, a shallow
bay was formed, into which several rivers discharged. The silt deposited at river mouths gave rise to the present delta and the shallow bay formed into a lake – lagoon – backwater system opening on to the Arabian Sea through Kochi barmouth. According to another theory, the entire sea area was a dense forest, the legendary Khandava vana (Khandava Forest), which caught fire and got engulfed by the sea during the succeeding geological ages. Years later, the sea receded, exposing the land which forms a part of the midland and coastal region of Kerala. This land was known as “Chuttanadu” meaning burnt land and hence the name Kuttanad. The entire area has a semblance of dense forest, rich in organic residues and burnt wooden logs locally called as Kari. With reference to elevation, geological formation and soil characteristics, Kuttanad deltaic formation is locally classified as karappadam, kayal and kari lands.

It is a reasonable assumption that in the days of Anthologies the settlements of Kerala, however sparse they were, as elsewhere in Tamilakam had a combination of unevenly evolved forms of subsistence making their economic milieu. It appears from the poems that the major localities of contemporary Kerala were on the Periyar while archaeology points to the Waynad hillocks (Gurukkal, 1999). The importance of the lower Periyar is obvious through its association with the Cheras. Of the unevenly evolved forms of production, plough agriculture was obviously the most developed one and also the superior in terms of technology and productivity. Anthologies indicate primitive agriculture and animal husbandry as the predominant forms of subsistence in contemporary society. But it did not entirely preclude the development of specialist forms of production as evinced by metal-working, particularly iron-working that had been quite important from the days of Megalith builders. Iron artefacts in the graves suggest that a great deal of iron objects were going out of circulation adding to the significance of continuous iron-working. Full-time specialist merchants were also there as attested by the references to several of them in the Anthologies (Gurukkal, 1999).

Much has been said about the importance of early Kerala in the context of Indo-Roman trade around the turn of the Christian era. References to ports, port-towns like Nelcyndon, Muziris and Tyndis and places like Cottanara found in the Graeco-Roman writings, the recovery of Roman coins from Kottayam (Kurumbranad), Eyyal (Trissoor), Valluvalli (Parur), Kizhalur, Edamaruku (Pala), Punjar, Niranam and Panangad and mentions about Muciri, coming of gold laden ships of the Yavana and their returning with pepper are all well known (Gurukkal, 1999). According to John (2001), the ancient Chera capital was Vanchi near Muzuris. The chief minister, the chief priest and the chief astrologer had great deal of influence with the ruler. There were at least five ports on the Malabar coast to which sailors came according to the Greek mariner who compiled Periplus of the Erythraean Sea. The most important port was Muzuris which stood at the mouth of the Periyar River. The location was where Cranganore (Kodungallore) stands today. The other ports were likely Kottayam, Thrippunithura, Pantalayani near...
Kollam and Calicut. *Patittipattu* describes that Cheras were called *Kuttavans*, who ruled over Kuttanad and it lays down that Palayanai Selikelu Kuttavan, the hero of *pattu III* has earned the title by his conquest of Kuttanad from the Pallavas (Nair, 1986) and Ptolomy’s “Cottanora” from where pepper was exported to Rome referred to Kuttanad (Menon, 1933; Shari and Chitra, 2005; Casson, 1989; Warmington, 1974). The Sangam Age literature, which praises the Chera Kings, have remarkable reference on the five *Deshams* under the Chera kingdom – namely *Venad, Kuttanad, Kudanad, Karkkanad* and *Poozhinadu*.

The locational feature of Kerala has influenced the social development and indirectly the style of construction. In the ancient times the sea and the Ghats formed impenetrable barriers helping the evolution of an isolated culture of Proto Dravidians, contemporary to the Harappan civilization. The earliest vestiges of constructions in Kerala belong to this period dated between 3000 B.C. to 300 B.C. There are evidences from the Meenachil river basin also for the Human settlement and inhabitation (Plate 2.1.1).

**Plate 2.1.1** News paper report on the evidence for earlier inhabitation in Meenachil River basin.

Pillai (1940) narrates that in the early years of the Christian Era, the sea is believed to have run along the eastern shore of the backwaters. Megasthenes (4th century BC) mentioned Thrippunithura as a
seaport. It is now more than four miles inland. The towns mentioned by Ptolemy and other geographers as lying on the sea coast between Muziris (Cranganore) and Barkare (Varkala) cannot be identified as the coast now runs. The taluk of Sherthal, which lies to the west of the backwater, did not exist in ancient days when Vaikom or Perumthura was an important seaport. A good portion of the taluks of Vaikom, Kottayam and Ambalapuzha and parts of the coastal taluks of the Cochin state must have been under the sea at one time.

The description by Ambat (1992) regarding the evolution of Vembanad lake region is a different one. It was recited that the Kaduthuruthy and Vayaskara near Kottayam were seaports during the past and the sea retreated gradually and formed the loam laden Kuttanad region. It is also postulated that when the sea retreated, the river systems like Achankovil, Pamba and Manimala were suggested to have united near the Kuttanad region and had flown as a channel, parallel to the sea coast. This channel had an extension up to Cochin bar mouth. When the Vembanad Lake system was evolved by the subduction of the Kuttanad region, this channel also might have subdued and turned as a platform for the lake.

All the above remarks are related with the elevated sea level during the geological past and how the society had benefited from such a condition. It is evident that the western coast experienced almost uniform geological disturbances due sea level fluctuations, except certain regional phenomena like the formation of estuaries and lakes, including the Vembanad Lake, along the coastal belt.

The channel rearrangement of the Meenachil River basin has a great remark in ancient literature. The Aithihyamaala written by Kottarathil Sankunni (1934) has a reference on Meenachil river channel under the chapter entitled Kaaladiyil Bhattathiri (Chapter 16). Sooryakaalady Mana (the house of Namboothiris), which is now located at the northern bank of the Meenachil river, is famous for the worship of God Vighneshwara and from the time immemorial, the Bhattathiris (Brahmins) of the Mana were believed to be buttressed on the grace of God Vighneshwara. One of the portions under this chapter, the story is being told like that one of the Bhattathiris of the Sooryakaalady Mana had desired to appear in Thaanam (a ritual religious congregation) and he went to Calicut (the country was under the Zamorins) for the same. It was a custom that only the Brahmins residing up to Kavanaar (Meenachil River) had the right to attend the Thaanam and the Sooryakaalady Mana was then located south of Kavanaar. The other Brahmins assembled for the Thaanam quarrelled with the Bhattathiri, as he was not eligible to participate in the congregation. Even though the reality was against him, the Bhattathiri argued that his Mana was located at the northern bank. The matter was taken before the King Zamorin and the king entrusted in Bhattathiri and allowed him also to participate in Thaanam. The king also ordered to send one of his reliable servants to check, whether the Mana is located north or south of
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Textural Characterization ……….Channel Re-orientation

Kavanaar. The king ordered the Bhattathiri to stay with him until the servant comes back and if found genuine, the Bhattathiri would further be honoured and if his statement were a lie, he would be punished severely. The servant could only see that the Kavanaar was flowing south of Mana! The Zamorin was pleased by the incident and he honoured the Bhattathiri with rewards and money.

The story continued like that, originally the Sooryakaalady Mana was located at the southern bank of the Kavanaar and the Bhattathiri had no right to participate in the Thaanam. When the argument started off and the Zamorin ordered to check the reality, it was God Vighneshwara, who with his single horn diverted the flow of Kavanaar and made it along the southern side of the Mana for saving the Bhattathiri from the king’s displease and annoyance. The geographical position of the Mana and its adjoining area ratifies the myth.

In other remarkable narration the Unnuneeli Sandesham, written around 14th century AD by anonymous author, clearly depicts the status of the Meenachil River during that time. The 129th Shloka (paragraph) of the said Sandesham reads as follows:

Entellaam kettavideyulanaamaakil nee bimbaleesham
Ventikkuntnoruthilakamaam ramavarmaabhidhaanaam
Kandittettem virivil maruvaarkaalane vaikiyaathe
Chenchemme poy mahitha thiruvaanchaippuzhackangu chelka

Means
After hearing the arguments and debates of the Brahmins, go and see the graceful Vembalanattu Raja named Ramavarma and then travel to sacred Thiruvaanchippuzha.

The Sandesham continues in the 130th Shloka that

Viprendraanaamabhijanavathaam vaasasanketha seema
Meenaam jaanudwaya samadhura swachchaneeraabhiraamaam
Chchathra shreneee virachitha nadappanthaloode nadanne
Thathrathyanaaanam vividhamavidhaanaadavum kettukolka

Means
After crossing the Meenachil River having immaculate water and bordered by Brahmin settlements and walking beneath the shed being made with the umbrellas, you can hear different annotative sounds there.
In both the Shlokas the narration throws light on the status of Meenachil River. In the 129th Shloka the remarks on Thiruvvaanchippuzha might be linked with the present Thiruvanchoor, but the stream that flowing near to it is the Meenadom Ar and an abandoned channel with array of lakes. Similarly the river that mentioned as Meenachil River in the 130th Shloka had only two-feet depth. It was having immaculate water and one could travel across it without any difficulty. It is quiet understandable that the river morphometry and quality were entirely different from the present scenario of the Meenachil River.

During the field study, an interview was conducted with different people, who are aged more than 80 years for getting ancient hearsays regarding the River. It was told by many people that Kaakkathodu (a small tributary flowing near to Neerikkad lying in between Meenadom Ar and Meenachil River and is named Puttuchira Todu in its upper reaches) has a sacred background. During the ancient times this tributary was having full of water and the legendary Parasurama (according to Hindu mythology, Parasurama was remembered as the Brahmin incarnation of Lord Vishnu and also for his revengeful wars and destructive campaign against the Kshathriyas) used to offer the holy sacrifice at the bank of this Kaakkathodu for the ancestors and for the Kshathriyas he eliminated. Even if considered as a matter of coincidence, the rubber plantation adjacent to the Kaakkathodu is occupied by a large number crows (according to Hindu mythology, the crows are intrinsically related with the offering of holy sacrifice). This myth is also pointing towards the phenomenon called river avulsion or channel abandonment at the background of tectonism and sea level fluctuations.

Another hearsay is in connection with one the most important pilgrim centres of Kerala, the St. Mary’s Church, Manarcaud. Large number of devotees from all over Kerala had come in large Pathemaarys (very large country boats) to attend the holy Ettunombu (8-day fast) celebrations at the Church every year. Their travelling route would have been via Vembanad Lake - Meenachil River – Meenadom Ar, because the only waterway to access the holy Church is through Meenadom Ar. Present Meenadom Ar is a stagnant pool of water and it can’t sustain even small country boat.

2.1.5. FINDINGS

The reference on the archaeological evidences, literature and hearsays reveals that the western coast of India had witnessed episodes of marine transgression and regression coupled with tectonism. The narrow stretch of Kerala had the story of ancient civilization and trade, all benefiting the geomorphological changes along the coastal areas. One of the conspicuous matters regarding the geomorphological changes is that they were not restricted along the coastal belt, but had the reflections towards the interior also for modifying the drainage morphometry of the rivers and their orientation over
space and time. Meenachil River and the Vembanad lake region also have certain historical importance for having a number of sea ports enabling the trade with Egyptians and Phoenicians, which started from so early a date as 3000 BC. Geologically, the historic oscillations in the sea level and the tectonism could bring in a variety of geomorphological phenomena in the Meenachil river basin, like channel migration, channel abandonment, river avulsion, palaeo-deposit formation, etc.

2.1.6. REFERENCE

Chapter 2.2

Textural Characterization ……….Channel Re-orientation


