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Sri Lanka

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Volume IV: Issue I

Table of Contents

Regional deity beliefs and concepts of the Wanni Hathpattuwa

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Abstract

Wanni Hathpaththuwa is located in the upper part of the Kurunegala district in the present North Eastern province, which is in the region between Deduru Oya and Kala Oya. Many unique cultural features have emerged in this village society which was created based on the "Wew gammana". Like other parts of the island, this area has many unique religious concepts. The purpose of this research was to study the reasons and their nature that influenced the creation of indigenous religious beliefs, based on it. Data for the research were collected through field exploration, participant observation, and interviews. A manuscript containing poems sung during a ritual called "Bath Malava" was mainly used for the research. In this ritual, there are several concepts that they worship. "Ayyanayaka", "Kadawara", "Kambili", "Kalu Dewatha", "Handun Kumara" are among them. Also, there is another religious figure unique to this region called "Anguruwelle Muththa". There are many poems describing the genesis and other characteristics of that deities. For example, people believe that deities like "Aiyanaka", "Kadavara" and "Kambili" are not indigenous and migrated to this country from India. Among them, "Kalu Devatha" is believed to be the son of "Walli amma" and the god "Kataragama". The other thing mentioned in these recitals is that all these gods are Buddhists. Although these religious concepts were primarily based on Tamil culture, it can be believed that people integrated these religious concepts into Buddhist culture.

Keywords *- Wanni Hathpattuwa, Religious beliefs, Buddhist culture, Ayiyanayaka, Bath malawa*

Introduction

Although Sri Lanka is a small island in terms of land area, considering the historical background and culture, the characteristics of diversity within the unity can be identified. Within individual cultural streams, subcultural groups with diverse and mutually exclusive characteristics can be clearly seen in society. It is clear that they mainly used the land where they built their settlements. Different parts of the country have different beliefs and customs unique to each social group. Also, there are several religious beliefs and rituals unique to the "Wanni Hatpattuwa" region of the dry zone of Sri Lanka. By studying these behaviors anthropologically, a clear study can be done on how these societies were created, the reasons that influenced their creation and the environmental factors that influenced it. There is great variability among these religious beliefs and concepts, hence there are many religious beliefs that are unique from region to region. There are several such distinctive local deity concepts in the " Wanni Hatpattu" of Kurunegala district.

Research Methodology

The field observation method was used to collect the data required for this research. As the required sample for that, 'tank villages' based on the Madiyava irrigation system were used in Wanni Hatpattu in Kurunegala district. Interviews were conducted with the elderly people of this area and people involved in rituals like "Bath Malawa", "Pidilla" and "Kiri Ithuruma". In addition, participated in and observed the "Bath Malava" white magic organized in Moragaswewa Gramaniladari division of Mahawa Divisional Secretariat Division. A manuscript containing "Kolmura Kavi" sung at white magic was taken as the primary source and a library survey was carried out for further information.

The Location

Hatpattu belonged to the sub-administrative area of Sri Lanka called "Satkoralaya" during the Kandy period. The present "Satkoralaya" was introduced by the British in 1836.

As per the local administrative pattern, Vanni Hatpattu was a part of it. Wanni Hathpaththuwa had six divisions called "Korala".

1. Mee Oyen Egoda Koralaya
2. Hathalispahe Koralaya
3. Pahala Wisideke Koralaya
4. Gam Thihe Koralaya
5. Magul Medagan Koralaya
6. Magul Othota Koralaya (Thennakon, 2015, pp.16-17)

According to the present administration system, Sathkoralays belongs to the Kurunegala district. There are three divisional secretariat divisions in the present Vanni Hatpattu region.
They are,

1. Maho Divisional Secretory Division
2. Polpithigama Divisional Secretory Division
3. Ambanpola Divisional Secretory Division (Kurunegala shasthriya sangrahaya,2008, pp.33-35)

Regional divine concepts

After the Kandy period, Buddhism was not established as a strong religion in Sri Lankan society and the reason for this was the collapse of the Buddhist

dispensation in this country. By the time of the British, most parts of Sri Lanka had become isolated rural areas surrounded by forests, isolated from other areas. Buddhism was in decline at that time, so the Buddhist environment in these rural areas did not have a strong foundation. Because of that situation, these beliefs and concepts may have been created to overcome the threats and problems in these areas and to gain security in day-to-day life. The Tamil religious beliefs that have influenced the culture of this country may have contributed to that. The situation was the same in Wanni Hatpattu. However, the ancient people living in the Wanni Hatpattu tended to practice these beliefs and rituals in a manner unique to their region at every stage of their daily lives. Among these regional religious beliefs, there are a few deities mainly important to Wanni Hathpaththuwa.

1. Ayyanayaka Deviyo

2. Kadawara Deviyo

3. Kambili Deviyo

4. Kalu Devatha Deviyo

5. Anguruwelle Muththa

6. Gale Bandara Deviyo

Ayyanayaka religious concept

Many sources can be found about this god who people believe is in charge of Wanni Hatpattu. It's important to know that some of them are different from each other. Accordingly, there are several stories about the origin of Lord Ayyanayake. Following is the origin story of the god Ayyanayaka according to the Sinhala encyclopaedia.

After achieving power through meditation one sage is chasing "Umyangana" to catch her. Also, she is running away to escape from him. The god "Wishnu" saw this and created a beautiful lady who was swinging a golden swing in the road. After seeing the lady, the sage was enchanted by her and conceived a child in her right hand. After ten months the child was named "Kayyanar" as he was born in the right hand and later "Ayyanar", "Ariyanayagam" and later changed to "Ayyanayaka" for Sinhala pronunciation (Sin.Wi.Ko - Category - 755). It is believed that Lord Aiyanaka is also known as "Aiyanar" in Tamil Nadu and "Ariyanayagam" in Kerala. However, according to Prof. A.L. Basham, the god "Ayyanar" worshiped in Tamil areas is the son of Lord Shiva (Disanayaka,2014,20).

Like many other beliefs, God Aiyahaka is also given a Buddhist background. It is explained by mentioning in "Kolmura" poems that Lord Ayyanayake visited this country with the permission of Lord Upulvan, and when Lord Buddha visited the garden called "Malla" he took permission from him to save the world (Kariyawasam, 1991 -20). Although these religious beliefs are rooted in the Tamil people, it is clear that these religious beliefs have changed to suit the cultural life of the rural people of Sri Lanka. The belief and concept of Ayyanayake God, which the people of Wanni Hatpattu worship, is evident from the poems sung during the "Bath Malawa" white magic held for Lord Ayyanayake. It says that Lord Ayyanayake was born in a city called "Malla" in India. He has left the city of "Madura" to come to Sri Lanka. The poems mention several people who helped him. They are "Kambili", "Kadawara", "Kalu" and "Gurumal Heda". In particular, God "Kambili" made a stone ship to travel across the sea.

In "Bath Malava" ritual poems sing some special poems called Ran Neve Kavi. These stanzas tell the story of Lord Ayyanayake's visit to Sri Lanka with his followers. Lord Ayyanayake made a golden ship and started his journey toward Sri Lanka through the Milky Sea. On the way suddenly the ship froze up and didn't move. Later on, learning that this was the work of God "Kambili" he asked to take his offerings as pooja. The ship started to move and again froze up and found out that this is an act of god "Kadawara". Ayyanayaka god promised to give him some of his offerings called "Kiri Ithurum Gotu". Likewise, five gods came to this country and landed in the Jaffna region and later arrived in areas like "Eppawala", "Amulakole", and "Galagiriyagala" to help people. It is further stated that Lord Ayyanayake resides with the blessings of the Sri Lankan Lord "Saman". Lord Ayyanayake used an elephant for his travels. He always travels with other gods and the "Kalu Devatha", "Ilandari Deviyan", "Kambili Yakshaya" and "Kadawara" are his attendants. Even today, people offer sacrifices to Lord Ayyanayake and these five deities.

In South India, there are idols of God called "Aiyanar" riding an elephant or a horse. Many of those idols show him riding a horse (Shasthri, 1986, 232). Accordingly, how the Indian God Aiyanar and the Sri Lankan Lord Ayyanayaka were depicted is somewhat contradictory because, according to the Kolmura chant, Lord Ayyanayake is on an elephant. However, some Indian scholars consider the famous statue of a man and a horse's head in the "Isurumuniya" temple in Anuradhapura to be a statue of Lord Aiyanayak (Dissanayake, 2014, 36). Accordingly, we can think that the history of worshiping Lord Attanayake dates back to the Anuradhapura period. That is because there was a lot of South Indian political interference throughout the Anuradhapura period. We can imagine through the statues and other arts that those political interferences and Tamil culture influenced the Sri Lankan

culture. Therefore, it cannot be assumed that South Indian gods and religious concepts did not influence Sri Lankan culture. However, there are no sources to confirm the actual period when the concepts of Lord Ayyanayake came to Sri Lanka. Some “Sandesha Kawya” written in the eras of Gampola Kotte mention that there were temples to worship Lord Ayyanayake. It is mentioned in the book "Kokila Sanendeshaya" that there was such a place near the city called "Mawatu Patuna" during the Kotte era (Gunawardana,205.206 poems). The worship of these gods in the Vanni must have spread since those periods. In the 20th century, Mr. Wimalaratne Kumaragama, while working as a revenue controller in areas such as Vanni Hatpatwe Mahawa, Navagathandadagama, wrote a poem called "Aiyanayake" about deity worship and an Ayyanayake temple in that area (Wijesinghe,2017). It shows that people had a strong faith in Lord Ayyanayake even then.

Lord Ayyanayake is the presiding deity of the annual "Kiri Ithurum" ritual held near the Madiyava tank in Mahawa Divisional Secretariat Division in Vanni Hatpattuwa. In that ritual, the priest who conducts sacrifices goes to this reservoir and offers a few special sacrifices to Lord Ayyanayake. Success in agriculture and rain at the right time is the main expectation of doing this ritual. Therefore, it is shown that the concept of the god Ayyanayake was formed based on the agricultural economy of Wanni Hatpattu.

Due to the lack of evidence, it is not clear in what period this concept of Ayyanayake Deva with Indian roots became popular among the people of the Wanni Hatpattutu area. The upper part of the Puttalam district and Kurunegala district of the North Western Province were frequently attacked by the South Indian Dravidians during the medieval period. However, the people of Vanni Hatpattu worship these deities with great respect. Even now, people passing

by the Ayyanayake temple near "Deduru Oya", park their vehicles and offer tribute to the temple next to the river and receive blessings by beating coconut. There used to be a small fane there. And that time, the carters and the passengers hang leaves and branches in this temple. This was done because the villagers believe that the area around Deduru Oya and Mee Oya is the site of Lord Ayyanayake.

The concept of the god Ayyanayake, inspired by the Indian Tamils, has been adopted by the villagers to suit the Sri Lankan culture. A good example of this concept being rooted in Sri Lankan culture is the praise of God Ayyanayake as a follower of Lord Buddha in Kolmura poems and the mention of him as one who received the blessings of Lord Buddha. Also, even in the idols in the fanes of Wanni Hatpattu, Lord Ayyanayake is depicted as a Sinhalese deity. He is depicted as an elderly man with a long beard and holding a long cane in his left hand and a "talipot" book in his right. He is also known as "Ayyanayake Mutta". This shows how close this god is to the people of Wanni Hatpattu.

Kadawara Religious concept

Lord Kadavara, who is worshiped by the people of Vanni Hatpattu, is considered to be a half-god because he is considered both a god and a demon. The god Kadawara is popular among the people in Wanni Hathpaththuwa as well as the god Ayyanayaka.

There are several Genesis stories of Lord Kadavara. The main one is the story that he is considered a god born in Sri Lanka. However, according to Kolmura chants, he is an Indian god who came to Sri Lanka.

Once upon a time, there was a powerful baron in the central country. He had a son with all kinds of bad traits. For that very reason, he was banished from the palace. Living with wild animals, he lost the ability to speak because he lived in the jungle with wild animals for a long time. After a long time, some servants who worked for the baron saw him in the forest with the animals, tracked him down, and brought him back to the palace. Because of the life in the castle, he was able to talk again. Then the baron came to the prince and asked what the largest thing was seen in the forest. And he replied that he saw a large creeper. The master asked him to show where it was located. The Lord built a giant reservoir around that place, which was later known as 'Kala Wewa'.

The "Kala Wewa" enabled the farmers to successfully carry on their agricultural activities, but during the dry season, it dried up and destroyed all the fields. Baron was saddened by this and invited the Buddhist monks to chant "Pirith". Then the rains started, and the "Kala Wewa" was once again filled with water and farming was successful. As time passed and a long drought came, the "Kala Wewa" dried up completely. Once again, the baron invited sixty monks to recite the Pirith. Then it started raining. There was a pot that indicated the water level in the Kala Wewa. The baron checked the pot from time to time. At last, the tank was full, so the pot was also full. Seeing this action of the baron, a monk pierced the pot with his walking stick. When the pot was pierced, a sound like a gunshot was heard. Along with the rupture of the pot, the embankment of the Kala Wewa also broke, and the area was flooded. Later, the baron came to know that it was a monk who pierced the pot. The baron was enraged and beheaded all the monks, putting the heads in the hole in the wall of the "Kala Wewa", after which he also jumped into the tank and killed himself. While jumping to the broken place in the "Kala

Wewa", the king said that he would die after drinking the blood of the monks. He was born in that damaged place (Kadawala) so he was called "Kadawala" and later "Kadawara" (Disanayaka,2014,41).

Kadwara mentioned in the custom of "Kohoba Yak Kankariya" in the Udarata region is also from India (Disanayaka,2014,46). In the 'Ran Nawe' poems sung during the "Bath Malawa" ritual of Vanni Hatpattu, it is mentioned that god Kadavara came from the city called "Madura" in India along with the god Ayyanayake. With the permission of Lord Ayyanayake, milk rice can be obtained from the offerings made by people to god Kadawara. Therefore, people often make a separate offering to this god in rituals like "Bath Malava". According to the recitals of "Bath Malawa" the god Kadawara is in charge of areas like "Kala Rata", Trincomalee, Mannar, Chilaw, and "Pahalospaththuwa". People also call him the protector of sacred places like "Sripada", "Diwa Guhawa", "Jaya Sri Ma Bodhi", "Temple of the Tooth" etc. It shows that people tried to bring these gods and other beliefs into the Buddhist culture which was the main culture among the people. The god Kadawara holds in one hand the object called the gem anklet (Mini Salamba) and on the other hand the giant farming implement called 'hoe' made of twelve thousand pieces of iron. According to the Kolmura chants, Lord Kadavara always carries these when he moves around the Wanni Hatpattu. The fact that the main weapon of God Kadawara is a hoe shows that this concept of God was created based on the agricultural economic background of this area. However, people have more faith and respect for this deity as they believe that this deity is in charge of all the tanks in the area. Wanni Hatpattuwa is a society based on agriculture. Therefore, every village remained as lake village. Therefore, people have offered sacrifices to this god for success in agriculture.

Rituals such as "Bath Malawa", "Pidilla", "Yahan Deema", "Lake-side Milk Festival", and "Kadawara Yak Kankariya" have been performed by the villagers of Wanni Hatpattuwa for God Kadwara. Nowadays these rituals are very rare. Since there is no mention of this concept of God in Indian sources, it can be concluded that this concept of God was created in Sri Lanka. Since the concept of this god was more widespread in the areas where agricultural activities were common, it can be concluded that the villagers believed and worshiped this god in anticipation of the prosperity and development of the society.

Kambili Religious concept

The people of Wanni Hatpattu respect the gods "Kambili" above all other gods. Therefore, Kambili gods can be called as a major belief among the people of Vanni Hatpattu. In the interview with Mr. KM Ukkubanda, a seventy-three-year-old resident of "Ambagaswewa" village in Vanni Hatpattu, he mentioned that these gods often provide help and protection to the people of Vanni Hatpattu. He annually performs the traditional ritual called "Bath Malava" to these deities. It is a custom of his lineage. The purpose of these rituals is to ensure agricultural success throughout the year and to protect these agricultural practices. According to their beliefs, these gods are quite harsh. There are three Kambili gods.

1. Kalu Kambili

2. Heda Kambili

3.RathnaKambili

The Kolmura poetry manuscript belonging to Mr. KM Ukkubanda mentions the origin of the Kambili gods and their arrival in Sri Lanka. According to

these chants, these deities have come in a golden boat accompanied by the god Ayyanayake who has a red cloth. Acting as a follower of Lord Ayyanayake, Lord Kambili went to the village of "Pimburuvella" in Anuradhapura to protect the people. According to people's belief, the main place where this deity resides is "Pimbuwelle Devalaya". Lord Kambili is worshiped by the people in Wanni Hatpattu as one of the five gods who came from India, including "Aiyanayaka", "Kadawara", and "Kalu Devatha". As there are several legends about Lord Kambili, he seems to be very close to people. Most of these stories are based on the incidents between Lord Kambili and a doctor (Veda Mahaththaya) who lived in the village called "Kandubadagama" near "Yapahuwa" in the Vanni Hatpattuwa area. This is mentioned in several Kolmura poems sung during the "Bath Malava" ritual. These legends are confirmed by those poems. Among those poems, some poems have recently been added to the offering. According to these stories, the doctor used the Kambili devil for his work. Because of that, he had to face many troubles. However, from these legends and the Kolmura chant, it can be concluded that Lord Kambili was worshiped by the people as a special deity.

Kalu Devathava

"Kalu Devatha" is another religious concept unique to Wanni Hatpattu. This deity is also worshiped during rituals like "Bath Malava". In the hymns sung during this ritual, it is mentioned that this god along with "Aiyanayaka" also came from India. His origin is defined by a Buddhist background. In the "Vidura Jataka" among the Jataka stories, Kalu Devatha is introduced as the son of the demon Purnaka and the serpent princess Erandati. After he came to this country, he made "Nuwara Kalaviya" and "Wanni Hatpatttu" his home. People believe that this god belongs to the cowherds. He is the lord of cows and protects cows. According to the "Kolmura" poems, he is also in charge of

the cattle herd of the God "Kataragama". Because of that, people worship him with more respect. Another conclusion can be drawn that he is the god based on the agricultural and economic society of this area.

Handun Kumara Deviyan

Another deity worshiped by the people of Vanni Hatpattu is "Handhun Kumara". He is quite special because he is of local origin by birth. As this god was born from a Sandal flower, he got the name "Sandun Kumara". It is mentioned in the poems that "Valli Amma" belonging to the "Vedi" tribe, who was the wife of the god "Kataragama", adopted and nursed this god. This deity resides in the area called "Pimburuvella" and according to the beliefs of the people of the Wanni Hatpatttu area, he provides shelter to the people of Satkorala.

Anguruwelle Muththa

There is also a deity called "Anguruwelle Mutta" in this area. This God is unique only to the Wanni Hatpattu region. This is the origin story of this god.

When the "Mee oya" stream flowing through Wanni Hatpattu dried up during the dry season, people used to fish in the few waterholes left in the river. There was an old man (mutta) who used to go there every day to collect fish as ransom from these fishing holes. Enraged by the daily extortion, the men dug a pit in the ground, filled it with logs, and burned it until it turned into hot coals. After that, they covered the pit with sand. Mutta came to get the fish as usual and sat down where they had set the trap. He fell into the pit and burned to death. After this tragic event, he died and was born as a demon.

However, the people of Vanni Hatpattu believe that he provides protection to the people living on both sides of the river. Villagers believe that for the protection of the harvest, when lost in the forest or when afraid, break a leaf

branch and remember the "Anguruwelle Muththa" and the fear will disappear. "Anguruwelle Muththa" is sometimes called "Mee Mutta" by the villagers.

Reasons for the popularity of these religious beliefs among the people of the Wanni Hatpattuwa area

Considering the history of religious beliefs in Sri Lanka, it is clear that the belief in God was mixed with Buddhism and Hinduism and gradually developed. Later, many gods spread throughout this country. It has been revealed above how religious concepts arose in the Wanni Hatpattu area. It can be concluded that most of them are created according to social and environmental conditions. A harsh, dry, and forested agricultural society existed in the Vanni Hatpattu area. Therefore, people had to face many challenges in their daily life. It can be believed that people developed these religious beliefs to overcome these challenges and threats. They created conceptual things like gods and other invisible forces and worshiped them hoping that their wishes would be fulfilled. All these gods help people. These gods protect the crops, give rain, protect people from diseases, help to overcome fear, and help people when they are lost in the forest. Considering the origin of these deities some of them are given as deities with Indian roots but who took refuge with the Buddha. Other deities are created according to certain historical stories of that area. The people of Vanni Hatpattu worshiped those deities according to Buddhist culture. It shows that people created these gods according to their cultural background as well as answers to their real-life problems. Moreover, many of these gods bless their agricultural activities and protect their crops. Hence, the concept of God influenced the agricultural economy of the area. A study of religious beliefs around the world shows that the religious beliefs of many societies are shaped by their local productions. For example, many of the religious beliefs of the "Vedi" people of Sri Lanka

are based on their hunting lifestyle. Many of the gods of Greek civilization were based on agriculture, trade, war, etc., which were part of their society. Thus, several examples can be identified by studying the characteristics of societies around the world.

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Drilling Tools in Prehistoric China from the Perspective of Experimental Archaeology

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Abstract

As a type of artifact commonly found in Chinese prehistoric sites, perforated shellfish materials can be classified into freshwater mussel materials and perforated seashell materials, and drilling tools can be classified into single and composite drilling tools. The experimental reconstruction of the two types of drilling tools and drilling methods explored the influence of the composition of drilling tools, drilling methods, and other factors on the drilling process. Meanwhile, the experiments were recorded and analyzed using a stereo microscope. The experimental results show that the composite drilling tools provide better drilling results and more dynamics than stone drill bits. The perforated weight stone stabilized the center of gravity and safeguarded the dynamic performance. The type of drilling tool, drilling method, and characteristics such as smoothness and hardness of perforated shellfish materials significantly impact the drilling effect.

Keywords: *Drilling Tools, Perforated shellfish, Experimental archaeology, Prehistoric*

Introduction

In China, archaeologists have successively discovered the remains of stone drill bits and perforated weight stones related to drilling technology in Beijing, Hebei and Jiangsu, accompanied by the excavation of perforated freshwater mussel products, perforated seashell products and other remains, and there are evident traces of wear and tear on the excavated stone drills. From the classification situation, drilling tools can be divided into single drilling tools and composite drilling tools. Single drilling tools such as stone drill bits, and composite tools usually consist of a drill shank, drill bits, and perforated weight stones with the ability to rotate the hole.

As far as China is concerned, attention to prehistoric drilling tools has mainly focused on research related to jade and stone tool drilling techniques. In contrast, more research needs to be carried out on prehistoric drilling tools based on excavated drilling tools and perforated shell materials from the perspective of experimental archaeology.

Related experimental studies such as Gu (1986) has argued, made drilling tools, dug holes in mammalian bones and tooth roots, ground holes in shells and gravel for experiments, and sometimes used composite drilling methods, such as chiseling and then drilling holes in shells, and combined with the results of the experiments and the analysis of the microscopic traces, considered that the holes in the decorations made of animal teeth and shells unearthed at the Xianrendong Cave, Haicheng, were mainly drilled with drilling tools.

Through the experimental reconstruction of the drilling tools and shellfish drilling process in prehistoric China, in-depth analyses of the making and use of drilling tools were carried out. The individual feelings of the experimenters

were included in the overall consideration to analyses the relationship between the drilling tools, the drilling tools, and the shellfish drilling materials and provide practical insights for exploring the drilling tools and shellfish drilling process in prehistoric China.

Background: Perforated shellfish materials and drilling tools in Prehistoric China

Several prehistoric sites have been excavated in China, and many perforated materials, stone drill bits, and perforated weight stones have been unearthed. The appearance of perforated materials proves that people were able to perforate artefacts during this period consciously. Worldwide, drilling technology originated in Europe during the Middle Paleolithic, and perforated materials of different materials were excavated in China, Japan, and the Korean Peninsula until the Upper Paleolithic, but in smaller quantities (Wang, 2009). In Paleolithic sites of China, many perforated seashell materials and perforated freshwater mussel materials have been excavated, such as shell ornaments excavated from the Shan dingdong Man in Beijing (Figure 1a; Jia, 1951: 70), perforated freshwater mussel shells excavated from the Xianrendong Cave in Liaoning (Figure 1b; Huang et al., 1986), perforated freshwater mussel shells excavated from the Shizitan site in Shanxi (Figure 1c; Song and Shi, 2013), and perforated shells excavated from the Hutouliang site in Hebei (Figure 1d; Gai et al., 1977).

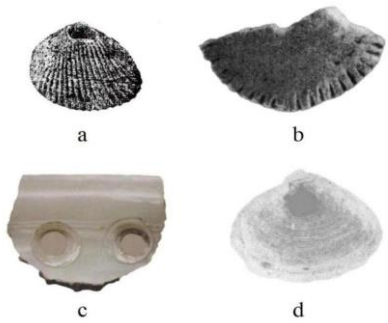

Figure 1. a. *Shell ornaments excavated from the Shan dingdong Man. (Pei, 1951: Figure 38). b. Perforated freshwater mussel shells excavated from the Xianrendong Cave. (Huang et al., 1986: Figure 1-6). c. Perforated freshwater mussel shells excavated from the Shizitan site. (Song and Shi, 2013: Figure 4). d. Perforated shells excavated from the Hutouliang site. (Gai et al., 1977: Figure 2-17).*

A number of the Neolithic sites have also recovered large quantities of perforated freshwater mussel materials and perforated seashell materials, such as the Zengpiyan site (10,000-5,000 BC), where a freshwater mussel knife, No. DT6㉕: 007 was excavated and pierced unidirectional through two holes in the middle of the upper middle part of the mussel; the holes are sub elliptical, and the residual length is 6.7cm, the width is 3.7cm in length, 3.7cm in width, and 0.7 to 0.8cm in diameter (Figure 2; The Institute of Archaeology, Chinese Academy of Social Sciences et al., 2003: 107).

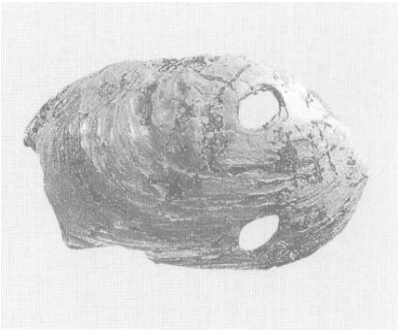

Figure 2. *A freshwater mussel knife excavated from the Zengpiyan site. (The Institute of Archaeology, Chinese Academy of Social Sciences et al., 2003: Figure 19-4).*

Located at the Nan Baoligaotu site in Inner Mongolia and dated to about 3,000 BC or slightly later, three shell ornaments have been excavated, made of scallops, with the inside of the bottom end ground into a groove, with symmetrical four circular holes on the two ears of the bottom end, and five circular holes evenly distributed on the surface of the scallops, measuring 13-15cm in length, 13-14.6cm in width, and 0.1-0.7cm in thickness (Figure 3; Ji and Zheng: 2017).

Figure 3. *Shell ornaments excavated from the Nan Baoligaotu site. (Ji and Zheng, 2017: Figure 38)*

The Nibazhai site in Sichuan is a Neolithic (c.8,000-2000 BC) to Zhou Dynasty (1,046-256 BC)site , where a perforated shell ornament, No. NBZC: 1 excavated, white overall, with a mixed blue-violet colour in the middle, oval in plan, hollow, with a jagged centre seam, and with a sub-circular perforated hole in the upper middle of the convex surface, measuring 2.5 cm in length, 1.8 cm in width, 1.1 cm in thickness, and a hole of 0.5 cm in diameter (Figure 4, Chen et al., 2020).

Figure 4. *Perforated shell ornaments collected at the Nibazhai site. (Chen et al., 2020: Figure 5).*

From the point of view of piercing methods, the piercing methods used for different textures of perforated materials are different, and the perforated materials are also affected by the drilling methods, resulting in different shapes of drilling traces. For example, perforated bone materials and perforated freshwater mussel materials are mostly drilled by cone drilling technique, and the shape of perforations made by this method is more rounded, which is caused by drilling tools or pointed artifacts, while some perforated mussels are also perforated by the bipolar technique, and the perforations made by this method are more irregular (Chen, 2009). Perforated shellfish materials, on the other hand, are mainly drilled by means of cone drilling techniques and sometimes by grinding drills.

In addition to the material with holes and the drilling method, the drilling tool is essential in the drilling process. The drilling tools in the prehistoric period are mainly composed of two cases: single drilling tools and composite drilling tools. From the point of view, single drilling tools, such as drill bits, as a kind of single drilling tools, usually consist of stone, freshwater mussel, and bone. For example, the stone drill bits excavated from the Mopandun site in Jiangsu, a Late Paleolithic site, can be divided into triangular drills, leaf-shaped drills, chisel-shaped drills, long-bodied drills, short-bodied drills, thin-waisted flat-bodied drills, and two-headed drills (Figure 5; Zhang et al., 1985). Some of the stone drill bits have small shanks and are short-bodied stone drills, which is also consistent with the characteristics of shank binding (Chen, 1986). The stone drill bits were probably used as part of a composite drilling tool and were bound to other components using shank binding.

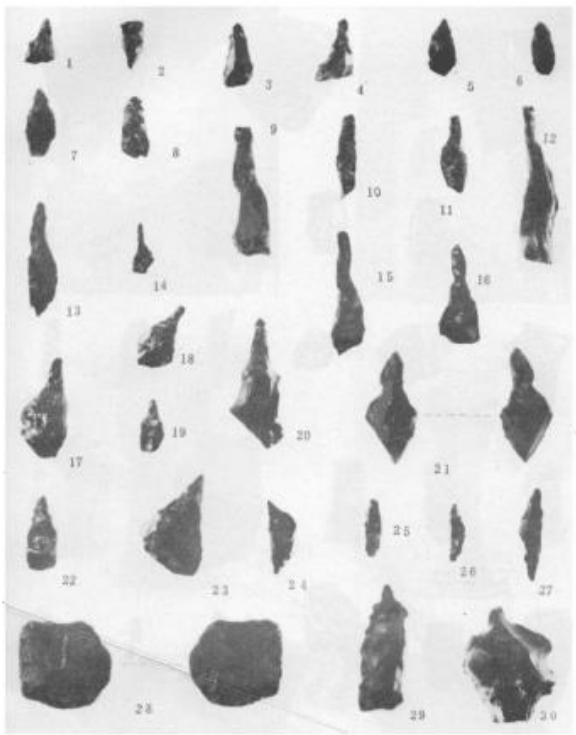

Figure 5. *Stone drill bits, excavated from the Mopandun site, 1-4 triangular drills, 5-8 leaf-shaped drills, 9-11 chisel-shaped drills, 12-16 long-bodied drills, 17-20, 22, 23 short-bodied drills, 21 thin-waisted, flat-bodied drills, 24-27 two-headed drills. (Zhang et al., 1985: Figure 8)*

During the Pre - Peiligang culture (12000-8500 BC), drilling technology began to develop in China, and the number of sites where perforated artifacts were unearthed increased dramatically (Wang, 2009). The use of composite tools also promoted the diversification of perforation technology, providing an effective way for ornaments, production tools, and other artifacts.

In terms of composite drilling tools, it may be possible to speculate on the composition of their components from archaeological finds, such as perforated gravel tools, also known as "Perforated stone" and "Weight stone", which can be used as part of a combination of tools to increase weight (Pei, 1935; Zhou, 2007). From the point of view of geographical distribution, perforated stones with different hole diameters have been unearthed in North China, South China, and other regions, and some of the perforated stones have moderate hole diameters, which are suitable to be mounted in a wooden stick, such as a perforated stone No. SBK:492 unearthed in the Zengpiyan site in Guangxi, which has a greyish-brown fine sandstone texture and a rounded, thick body, with the centre of the tool being drilled and ground through and pierced by the counterbore method, and the holes have smooth traces of the holes made by the drilling process. The hole diameter is roughly equal, and the hole diameter is approximately equal to the hole diameter, measuring 9.6 cm in length, 7.7 cm in width, 4 cm in thickness, and 1.6 cm in diameter (Figure 6; The Institute of Archaeology, Chinese Academy of Social Sciences et al., 2003: 231). On this basis, it can be surmised that the perforated weighted stone was likely used as part of a composite drilling tool to provide a counterweight.

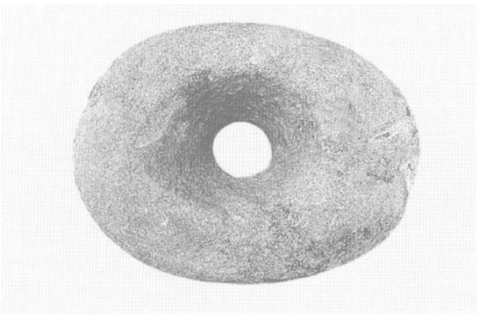

Figure 6. *A perforated stone unearthed in the Zengpiyan site. (The Institute of Archaeology, Chinese Academy of Social Sciences et al., 2003: Figure 42-1).*

Composite drilling tools also recorded in written historical sources; the "*Tiangong Kaiwu*" (Song 1637: 193) contained: "梓人转索通眼，引钉合木者用蛇头钻" (carpentry turnstile perforation to drive nails to put together wood pieces, with shetou drills), and in the "*Hegong Qiju Tushuo*" (Wanyan and Li, 1836: 309) on the carpenter used drilling tools have more graphic physical drawings, such as steely screw drill. These drilling tools were used in the modern traditional carpentry industry, Tangshan Fengrun Museum collection of 1 piece of modern traction drill, by the drill handle, drill rod, pull rod, drill rope, chuck, and drill, and its use is mainly for use in the processing of traditional wood products. The drilling tool carpenters in Linhai City, Zhejiang, use a stone drilling screw, a cord, and a pressure rod (Li, 2004: 188).

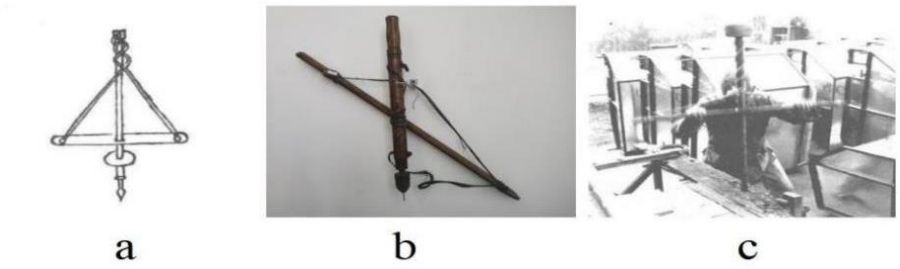

Figure7. a. *A steely screw drill recorded by the "Hegong Qiju Tushuo" (Wanyan, 1836: 309). b. Modern traction drill collected by Fengrun Museum, Tangshan, China. (Photo taken by Author, July 2023). c.A steely screw drill. (Li, 2004: Figure 5-4).*

From the written historical sources and the modern drilling techniques, perhaps some inspirations for examining how the composite drilling tools in prehistoric China got power conditions are obtained, which can help to understand further the production process of the drilling tools and drilling methods, and from the perspective of experimental archaeology, through the simulation of different types of drilling tools and drilling methods, combined with the archaeological discovery of drilled holes with traces of drilling on perforated shellfish materials, to explore the prehistoric drilling technology, and to consider the relationship between the components of drilling tools and the drilling effect in the actual drilling process.

Experimental Method

The experiment is divided into the preparation of experiment, experiment 1, and experiment 2. Each experiment is not isolated, with a certain degree of progressivity and relevance. The core of the preparation of the experiment is to determine the selection of materials used in the experiment. To reconstruct the process of drilling tools and perforated shells, some of the materials required for the experimental production are selected through fieldwork, which has a specific helpful effect on the pre-preparation process of the experiment so as further to explore the issue of shell selection in prehistoric.

The reconstruction planned for Experiment 1 is a reconstruction of a single drilling tool. In contrast, Experiment 2 is a reconstruction of a composite drilling tool, where certain relationships and evolutionary processes of use exist. Experiment 1 reconstructed the process of making and using stone drill bits further to explore the use of drilling technology in prehistoric China.

Experiment 2 was produced to explore further the findings based on the results of Experiment 1. Experiment 2 focused on the production of composite

drilling tools A, consisting of a stone bits drill and a wooden pole, Composite Drilling Tool B, consisting of a stone bits drill, perforated weight stones, a wooden pole, and a thick rope, Composite Drilling Tool C consisting of a stone bits drill, perforated weight stones, a wooden pole, and a thin rope, and drilling of seashells and freshwater mussels, to study the relationship of the perforated shell ornaments seen in archaeology to the drilling tools. The experiment explores the changes in drilling tools while analyzing them in the context of archaeological findings and previous scholarly research and contributes to the study of prehistoric drilling techniques.

During the experiment, the drilling of seashells and mussel shells was microscopically observed at any time using a stereo microscope XTL-165-XTWZ2T to explore the effect of different drilling tools on the drilling effect.

Preparation of Experiment

Prehistoric shellfish material with holes mainly consists of freshwater shellfish and seawater shellfish, freshwater shellfish such as mussels, and seawater shellfish such as clams, conchs, scallops, et cetera. Considering that early drilling techniques were mainly locally sourced, a field collection of wood needed for making drilling tools and mussels and seashells needed for the materials used for drilling is necessary (Figure 8a). Experimentally collected seashells included *Cyclina sinensis, Mactra veneriformis, Reeue and Ruditapes philippinarum,* and prepared seashells included *Monetaria moneta, Monetaria annulus, Monetaria caputserpentis* (Figure 8b). The collected and prepared seashells were then screened and cleaned based on the size of the perforated shell ornaments from the archaeological excavation process, from which medium-sized and undamaged seashells were selected. The mussel shells collected for the experiment included freshwater mussels (Figure 8c). The screening method was the same as for seashells, and the mussel shells

were intercepted after cleaning to obtain freshwater mussel materials that were flatter and less curved (Figure 8d).

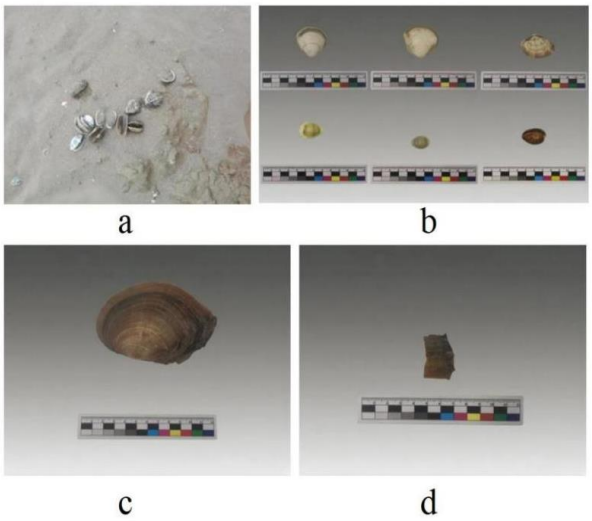

Figure 8. a. *Gathering of seashells. (Photo taken by Author, March 2023). b. Gathered and prepared seashell materials. (Photo taken by Author, April 2023). c. Prepared a freshwater mussel shell. (Photo taken by Author, April 2023). d. Intercepted a freshwater mussel material. (Photo taken by Author, April 2023).*

Although wood materials can be affected by environmental factors during burial and are not easily retained, the experiment still included them in consideration of components for the composite drilling tool. At the end of the organization and screening of the shellfish material, branches were picked up from a location closer to the experiment, straighter and more intact branches were selected whenever possible, and selected branches were sorted according to the size of their diameter (Figure 9). Tools were used to peel off the bark from the branches of the trees, making the wooden poles smoother.

Figure 9. *Collection of tree branches. (Photo taken by Author, April 2023).*

Experiment 1

Stone drill bits of materials selected flint stone, stone colour is yellow, the texture is pure, and impurities. The stone will use a bipolar technique after the formation of stone pieces, after the repair of the two ends to form a more prominent sharp tip, to get stone drill bits a and stone drill bits b. The drilling is done by the bipolar technique where the stone drill bits are first pressed against the top of the seashells and mussels to find a suitable smashing point. Then, the stone drill bits are struck using stones to leave an irregularly shaped hole in the surface of the freshwater mussels and seashells.

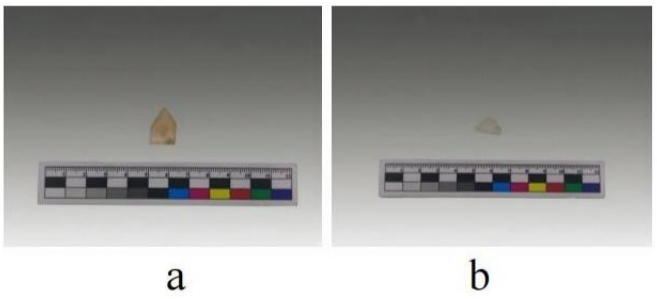

***Figure 10. a**. Stone drill bit a. (Photo taken by Author, April 2023). b. Stone drill bit b. (Photo taken by Author, April 2023).*

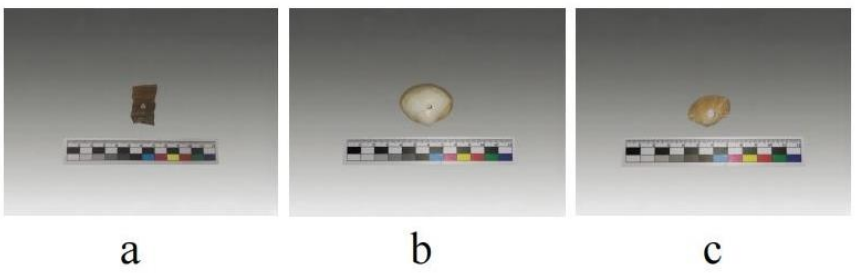

***Figure 11. a.** Perforated freshwater mussel material by bipolar technique. (Photo taken by Author, April 2023). b. Perforated Mactra veneriformis, Reeue by bipolar technique. (Photo taken by Author, April 2023). c. Perforated Ruditapes philippinarum by bipolar technique. (Photo taken by Author, April 2023).*

Considering the phenomenon of freshwater mussel shells and seashells excavated from archaeological sites, the experiment should also make use of the stone drills used in the experiment to grind and drill freshwater mussel shells, select a point on the convex side of the mussel shells, and rotate the

stone drill bit with bare hands at this point, repeat the rotation many times until a small hole is ground out (Figure 12a). A point was selected on the smoother side of the seashells, and the drilling method and process were consistent with using freshwater mussel shells for grinding and drilling, resulting in an oval-shaped hole (Figure 12b-12d).

The drilled mussel shells and seashells were microscopically observed using a stereo microscope at 7x magnification.

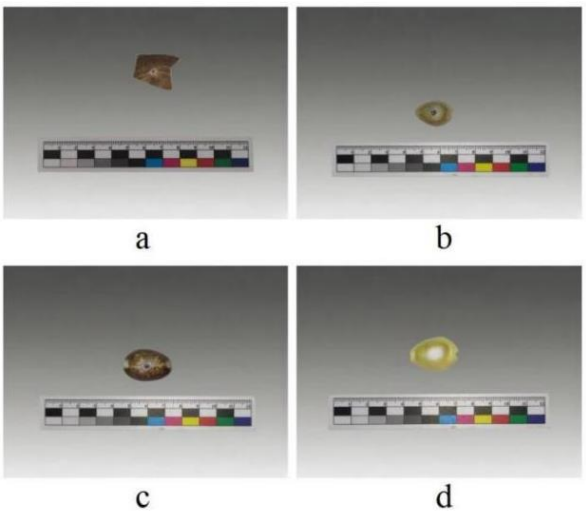

***Figure 12. a**. Perforated freshwater mussel material by grinding method. (Photo taken by Author, April 2023). b. Perforated Monetaria annulus by grinding method. (Photo taken by Author, April 2023). c. Perforated Monetaria caputserpentis by grinding method. (Photo taken by Author, April 2023). d. Perforated Monetaria moneta by grinding method. (Photo taken by Author, April 2023).*

Experiment 2

Experiment 2 used the collection of a large amount of material in the course of the preparatory work to reconstruct prehistoric wooden drilling tools. Since it is too old to find the actual object in archaeological excavations, it was still possible to restore the appearance of the wooden composite drilling tool through the traces of the artifacts.

Wooden Composite Drilling Tool A: Choose one end of a long wooden pole to make a groove, embed the stone drill bits made in Experiment 1 into the groove of the wooden pole, use a coarse hemp rope composed of natural plant

fibers to wind the stone drill bits so that fixed in the grooves of the wooden pole (Figure 13), and rotate the wooden pole after the making of the drilling tool to try to drill freshwater mussel shells using this tool.

Figure 13*. Wooden Composite Drilling Tool A. (Photo taken by Author, April 2023).*

Wooden Composite Drilling Tool B: The same pre-production process was used for the wooden drilling tool A. A hole was pierced through the top end of the long wooden pole (Figure 14a), a groove was made in the lower end of the selected wooden pole, and the stone drill bits made in experiment 1 were embedded in the groove of the wooden pole and wrapped using thin twine (Figure 14b) Choose a short length of wood to act as a short shank, and pierce a giant diameter hole in the centre of the shank, slightly larger than the width of the long shank, and then pierce a smaller diameter hole in each of the left and right sides of the short shank. Subsequently, the short-shanked wooden pole (Figure 14c) was inserted into the long-shanked pole. The two holes of the smaller diameter of the short-shanked pole and the one located at the upper end of the long-shanked pole were threaded using coarse sisal twine to form a triangular structure. The remaining coarse sisal twine was wrapped around the left and right ends of the short-shanked pole. The perforated heavy stone with

the cornstalks wrapped around it was placed above the stone drill bits at the end of the wooden pole. Once the drilling tool was made, attempts were made to drill freshwater mussel shells using the already-made wooden drilling tool B (Figure 14d).

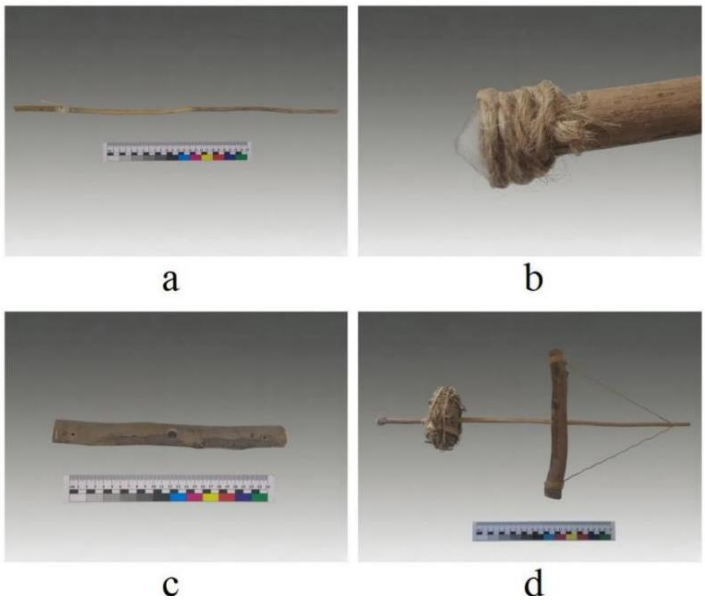

***Figure 14. a**. The long wooden. (Photo taken by Author, April 2023). b. Stone drill bits and wooden poles wrapped in thin twine. (Photo taken by Author, April 2023). c. Short shank. (Photo taken by Author, April 2023). d. Wooden Composite Drilling Tool B. (Photo taken by Author, April 2023).*

Wooden Composite Drilling Tool C: Wooden Drilling Tool C (Fig. 32) is reworked based on Wooden Drilling Tool B. Unlike Wooden Drilling Tool B, the rope used in Tool C is a fine rope, and the perforated weight stone used is first wrapped around with cornstalks, as much as possible, on one side of the outer edge of the perforated weight stone, and then placed at the end position of the long wooden pole.

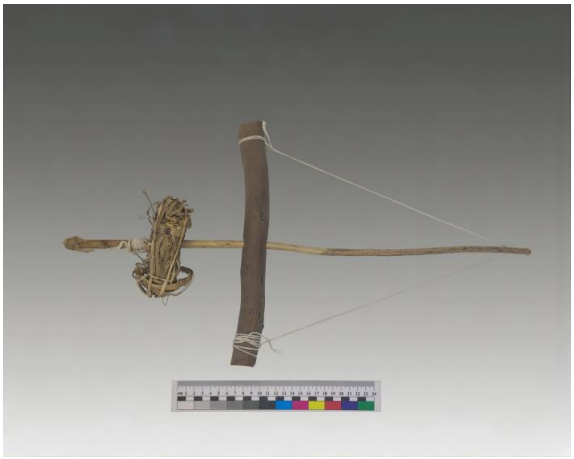

Figure 15. *Wooden Composite Drilling Tool C. (Photo taken by Author, April 2023).*

Once the drilling tool was made, it was used to drill holes in the freshwater mussel shells and selected seashells. During the drilling process, a drilling point was first found on the drilled material, and then the stone drill bits of the drilling tool were aimed at this point. Then, the short-handled wooden pole was pressed downward by hand until several winding circles appeared on the top of the long wooden pole. Then, the short-handled wooden pole was pushed upward by the effect of inertia. The cycle was repeated until the freshwater mussel shells and seashells were perforated entirely, and then it stopped running to get perforated materials (Figure 16). In jamming, it is necessary to manually rotate the long wooden rod to restore the dynamics of the drilling tool, enabling it to operate again.

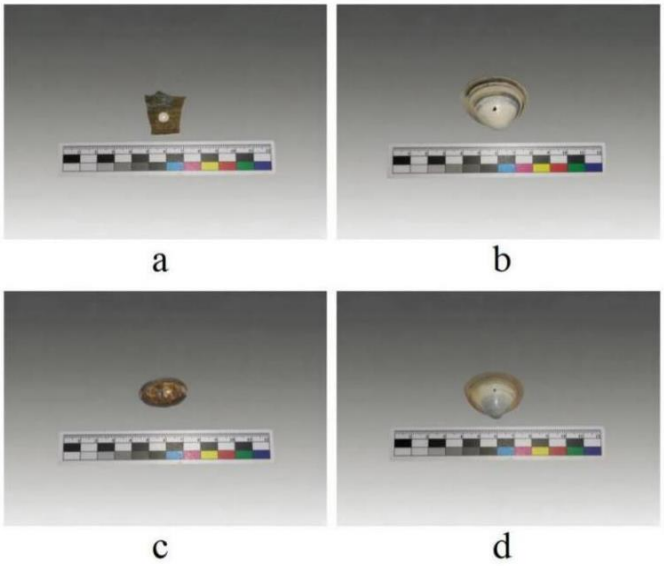

Figure 16. a. *Perforated freshwater mussel material by wooden Composite Drilling Tool C. (Photo taken by Author, April 2023). b. Perforated Cyclina sinensis by wooden Composite Drilling Tool C. (Photo taken by Author, April 2023). c. Perforated Monetaria caputserpentis by wooden Composite Drilling Tool C. (Photo taken by Author, April 2023). d. Perforated Mactra veneriformis, Reeue by wooden Composite Drilling Tool C. (Photo taken by Author, April 2023).*

Results & Analysis

Drilling effectiveness is closely linked to the type of drilling tool, as the hardness of the drilling material chosen for the drilling process is different, for example, the drilling method and the making of the drilling tool may be customized to suit the characteristics of the drilling material. In addition, drilling efficiency may be related to the dynamics of the drilling tool when using the same texture of the drilling material, with the use of a composite drilling tool resulting in more efficient drilling than the use of stone drill bits.

In terms of a single drilling tool, the results of Experiment 1 show that the use of stone drill bits can be used to drill freshwater mussel shells and seashells, and there is a close relationship between the use of drilling tools and the characteristics of the drilling material, the drilling process use of grinding for drilling. Due to the fragile texture of freshwater mussel shells and their roughness, it is easier to find the drilling point, increasing the drilling process's efficiency. Under the same conditions, the drilling of seashells, due to its more complicated and smoother texture characteristics, makes it challenging to find the drilling point, and the phenomenon of slippage often occurs, resulting in a reduction in drilling efficiency.

In the case of freshwater mussel shells, due to the fragile nature of the freshwater mussel shells, the drilling material may be easily damaged during the initial stage of drilling and may break. Similarly, although the texture of seashells is relatively complicated compared to freshwater mussel shells, if a person who is not skilled in drilling is allowed to drill the holes, the drilling material will be subjected to too much impact due to over-exertion of force, and it will also be fractured. The drilling method used in excavating freshwater mussels and seashells is a choice made by the ancients through the accumulation of long-term practice and according to the hardness and smoothness of the drilling material.

Concerning the composite drilling tool, the experimental results show that the drilling effect is related to the dynamic conditions of the drilling tool. Composite Drilling Tool A and Composite Drilling Tool B consume too much manual pulling force and fail to achieve the effect of saving labour. Although Composite Drilling Tool B forms a triangular rod bearing, which can stabilise the axis of the drilling tool and play a balancing role, because the use of the rope is too rough, the friction between the rope and the rod is too large, which

hinders the inertia produced by the drilling tool in the process of operation and fails to achieve the effect of the dynamics of the Composite Drilling Tool C. Therefore, there is likely an operational process of component commissioning before drilling with the composite drilling tool.

The experiment shows that the drilling effect is also related to the bending degree of the long wooden pole. Using a straighter wooden pole as the long wooden pole can keep the centre of gravity of the drilling tool on the stone drill bits, increasing the number of winding loops of the rope and increasing the rotational speed of the drilling tool, and the dynamics have been maintained. The use of bent wooden poles as long poles will easily cause the centre of gravity of the drilling tool to deviate, resulting in the stone drill bits not being able to stay stably at the drilling point of gravity, leading to a reduction in the number of wrapped turns of the rope, a reduction in the rotational speed of the drilling tool, and a loss of dynamics. In conjunction with the results of the experiments, if flat, straight wooden poles that can be shanked are found at archaeological sites, it may be possible to speculate that they may have had the ability to drill holes based on the selection of material for the drilling tools.

The perforated weight stone of Composite Drilling Tool B and Composite Drilling Tool C is of significance to improving drilling efficiency. In the drilling process, the perforated weight stone can increase the overall weight of the drilling tools so that the stone drill bits have been kept on the relatively stable drilling holes without deviation and play a balancing and stabilizing role for the centre of gravity, resulting in the dynamics of the drilling tools being guaranteed. In conjunction with the experimental results, it may be possible to decipher the function of perforated weight stones excavated from

archaeological sites, suggesting that they could have acted as a counterweight as part of a composite drilling tool.

Cornstalks are used to prevent and protect against accidents during the drilling process. During the making of Composite Drilling Tool B and Composite Drilling Tool C, the cornstalks are wrapped around the perforated weight stone on one side of the outer edge. If the perforated weight stone is not wrapped, it is likely to accidentally injure the hand due to the sharpness and roughness of the outer edge of the perforated weight stone when the tool is running at high speeds. Therefore, wrapping the perforated weight stone with cornstalks protects the hand.

The effect of the drilling tool on the drilling effect was significant, as shown by stereomicroscopic observation (Figure 17). the shape of the holes obtained from drilling the material with holes using stone drill bits is round mainly or nearly oval irregular shape. The edges of the holes are primarily jagged, while the shape of the holes obtained from the material with holes using the composite drilling tool is primarily round, and the edges are Un-jagged. The ability to drill holes is also related to the drilling tool's hardness, smoothness, and wear. The use of lower hardness or thinner stone drill bits was unable to drill holes in harder and smoother seashells, leaving only traces of wear and tear on the surface, as shown in Figure 12d and Figure 17g. The drill bits of the composite drilling tools need to be polished in the process of use to increase the sharpness of the drill bits. If not polished, it will make the stone drill bits blunt, resulting in the appearance of jagged material with holes, as shown in Figure 16c and Figure 17j. In addition, the drill bits need to be replaced on time in the case of long-term use to ensure the drilling efficiency of the drilling tools. The microscopic observation of these perforated materials is similar to the actual visual observation. Suppose the perforated materials are

found in the archaeological sites. In that case, the drilling tools and methods can be deduced based on the perforated materials' traces, experimental results, and microscopic observation.

No.	Perforated Materials	Drilling Tools	Drilling Methods	Photo No.	Stereomicroscopic Observation			Hardness Degree	Smoothness Degree
					Hole Formation Situation	Drilled Holes Shape	Drilled Holes Edge		
1	Freshwater mussel shell	Stone drill bit	Bipolar technique	17a	√	Irregular shape, nearly oval	Jagged	General	General
2	*Mactra veneriformis, Reeue*	Stone drill bit	Bipolar technique	17b	√	Irregular shape, nearly oval	Jagged	Hard	Smooth
3	*Ruditapes philippinarum*	Stone drill bit	Bipolar technique	17c	√	Irregular shape, nearly oval	Jagged	Hard	Smooth
4	Freshwater mussel shell	Stone drill bit	Grind method	17d	√	Oval	Un-jagged	General	General
5	*Monetaria annulus*	Stone drill bit	Grind method	17e	√	Oval	Un-jagged	Hard	Smoother
6	*Monetaria caputserpentis*	Stone drill bit	Grind method	17f	√	Irregular shape, nearly oval	Smooth, partly jagged	General	Smoother
7	*Monetaria moneta*	Stone drill bit	Drill with stone drill bit	17g	×	/	/	Harder	Smoother
8	Freshwater mussel shell	Composite Drilling Tool C	Drill with tool C	17h	√	Round	Un-jagged	General	General
9	*Cyclina sinensis*	Composite Drilling Tool C	Drill with tool C	17i	√	Nearly round	Un-jagged	Hard	Smooth
10	*Monetaria caputserpentis*	Composite Drilling Tool C	Drill with tool C	17j	√	Nearly round	Jagged	Hard	Smooth
11	*Mactra veneriformis, Reeue*	Composite Drilling Tool C	Drill with tool C	17k	×	Round	smooth	Hard	Smooth

Table 1. *List of information on perforated freshwater mussel materials and perforated seashell materials produced in Experiment 1 and Experiment 2.*

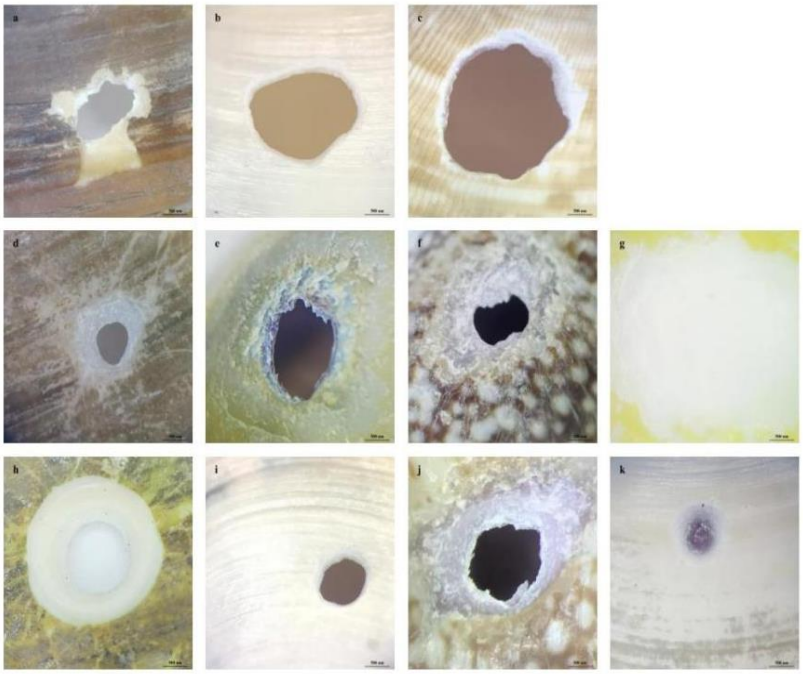

Figure 17. *Perforated freshwater mussel materials and perforated seashell materials at 7x magnification of the stereo microscope. (Photo taken by Author, April, 2023.)*

Discussion

Multiple drilling, it was found that the drilling effect of the composite drilling tool was better than that of the single drilling tool, and the operation of the composite drilling tool existed in a rotational process, with the stone drill bits as the point of focus, which presented a rounded shape of the drilled holes during the rotation. It was found that the drilling marks on the material with holes were different using different drilling methods, the shape of the drilled holes using the bipolar technique were mostly irregular shapes close to an ellipse with noticeable jagged edges of the holes, the shape of the drilled holes using the grinding method were mostly oval shapes with partially Un-jagged edges of the holes, and the shapes of the holes using the composite drilling tool were mostly round with smoother edges of the holes. As the direction of

drilling involved in the experiments was mostly unidirectional, the perforated shellfish materials were mainly characterized by the equal size of the inner and outer holes.

Perhaps accordingly, it is possible to interpret further the traces on perforated shellfish materials found at archaeological sites. Some perforated shellfish materials found at archaeological sites present drilling traces similar to those observed experimentally (Figure 16a and Figure 17h), such as a freshwater mussel ornament No. S12A: 025 excavated from the Shizitan site in Shanxi (Figure 1c; Song and Shi, 2013), which retains the lip of the mussel body as a whole, with the rest of the mussel piece edges slightly oval, and which the researchers believe should have been drilled in a The researchers believe that the drilling method should be unidirectional, and the drilling traces are characterized by the juxtaposition of two holes and the exact size of the two holes. Similar drilling traces have been found in many prehistoric sites in China. Combined with experiments, the shape, edges, and hole diameters of the drilling traces can be used to speculate on the drilling tools and methods used by people at that time.

In addition to the drilling effect, the technology applied in the production process of drilling tools is also worthy of attention, such as in the production process of composite drilling tools used in the shanking technology, which is a kind of technology that can be assembled into a composite tool of stone tools and handles, which can improve the utilization rate of the stone tools and the use of tools, and at the same time, the producers are required to have a pre-design and include a series of processes such as production, assembly, and maintenance (Lombard, 2005), and the materials and methods used for bundling has a certain complexity that reflects the more advanced cognitive and behavioral capabilities of humans (Zhang et al., 2010).

The drilling process also faces various challenges and choices; in this case, the experimenter acts as an ancient craftsman, relying on the drilling material and properties to find a good drilling solution to solve the difficulties faced in the drilling process. Combined with the experimental results mentioned in the previous section, in the drilling process of the composite drilling tool, the experimenter made changes in the drilling program for the characteristics of the sea shell material and adopted the direct drilling method at the initial stage. However, after a few attempts, slipping the drill bit appeared, making it difficult for the drilling tool to find a stress point to pierce the holes. It also forced the experimenter to change the way of thinking and make adjustments and improvement measures for the drilling process, considering the smooth characteristics of the sea shell material. At the same time, the experimenter had to change his thinking and make adjustments and improvements by combining the smoothness of the sea shell material with the characteristics of the stone drill bits, firstly, using the stone drill bits to rotate on the surface of the sea shells in a small degree to form a small concave point, and secondly, drilling the holes on the small concave point, in which way the drilling effect was significantly improved. The reason that the drilling effect improved may be linked to the subjective judgment and proficiency of the experimenter. Therefore, combining the subjective feelings of the experimenter in the drilling process, it can be speculated that the ancient artisans were strategic in the drilling process

Conclusion

As far as the experimental reconstruction of Chinese drilling tools is concerned, since there are few archaeological discoveries of drilling tools from prehistoric China, we can only rely on the traces left on finished or semi-finished products of perforated materials found at archaeological sites, as well

as artifacts that may be related to drilling tools found at archaeological sites, to speculate on the drilling tools and methods of drilling at that time. Experimental archaeology is like a bridge between the past and the present. Through the systematic understanding and analysis of excavated hole-carrying materials and drilling tools, experiments on drilling tools are designed and carried out, transforming static archaeological remains into dynamic experimental processes. It is an analytical method transformed into a dynamic process and product through simulated reconstruction.

Many experimental factors are involved in the reconstruction process, such as type of perforated materials, smoothness, hardness, method of drilling, composition of drilling tool components, and proficiency level to discuss the relationship between drilling materials and drilling tools and methods of drilling. The experiment's stone drill bits and wooden composite drilling tools can drill holes in seashells and freshwater mussels. The dynamics of the composite drilling tool and the addition of critical components affect the drilling effect. The composite drilling tool performs better than stone drill bits in the drilling process, and the drilling traces tend to be smooth and round. The key components are evident in the drilling effect of the composite drilling tools, which will indirectly affect the dynamics of the drilling tools, such as perforated weight stone and the smoothness of the wood poles. The features of the shellfish materials will also indirectly affect the drilling results, such as the roughness and hardness of the shellfish materials. Furthermore, due to the high dynamics and timeliness of the composite drilling tool and its possible use in the processing of shellfish products, it is likely to be applied to jade and stone processing and bone processing to improve the drilling efficiency.

Since the experimental process contains many experimental factors containing various small details, it is challenging to fully reproduce the ancient people's

drilling tools and drilling techniques by relying on more than one reconstruction. The reconstruction of the drilling tools involved in the experiment mainly focuses on the strategies and choices of the drilling tools and shellfish drilling techniques from the perspective of the ancient artisans concerning the drilling materials, in the hope of contributing to the understanding of the drilling traces on the perforated shellfish materials found at the archaeological sites.

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Delineating the Impact of social media Networks on Travel Decision-Making Process: An Experience of University Undergraduates

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Abstract

In Sri Lanka, the use of social media for the travel and tourism industry is in its growth stage. Businesses use social media to be discovered and become part of travelers' engagement in decision-making. This study aims at identifying the impact of social media on the travel decision-making process of travelers. Semi-structured interviews were conducted with 25 hospitality and tourism undergraduates in Sri Lankan universities using cluster and purposive sampling techniques. The collected data were then analyzed by using content analysis to achieve the objectives of the study. The findings revealed a strong effect of social media on university undergraduates' travel decision-making and their willingness to engage with social media as the mode of information source. Further, the most appropriate social media platforms to promote Sri Lankan tourism destinations were also identified through this study. It is recommended that travelers use diversified information sources active engagement, seek authenticity, and exercise caution when verifying information. Put succinctly, the support of the public and private sectors is verily needed for the stability and utilization of social media for promoting Sri Lankan tourism destinations.

***Key Words**: Social Media, Tourism Destination, Travel Decision, Making Process, Undergraduates*

Introduction

The tourism industry is one of the fastest-growing industries as well as one of the largest economic sectors all around the world owning 10.4% of the world GDP (Statista, 2020). According to Industry Research website IBIS World, the tourism industry has become among the top 10 biggest industries in the world. During this decade, tourism industry plays a major role in developing and under developed countries economy including Sri Lanka. In its quest to achieve sustainable economic development, Tourism has also been identified as a focus sector by government in Sri Lanka. The nation has also selected tourism as one of the key development strategies and has made various attempts to boost the tourism sector (Gnanapala, 2017). There are lot of factors affecting for that uncertainty in tourism.

Environment, economy, historical and cultural factors, religious concerns and technology are few of among. Technology is the one of important factor effect on tourism. Information technology is the major function in technology. In the tourism, travel and hospitality sector, Information Communications Technology (ICT) plays a major role. The incorporation of ICT into the tourism industry is vital to the success of tourism companies (Bethapudi, 2013). Hence, along with the internet invention, social media marketing has become one of the critical parts in business marketing. The reason may be the associated advantages with social media marketing; easy to reach large audience, direct connection with audience, free access, easy to access, easy fragmentation, build brand, easily can evaluate performance etc.

As a component in the travel and tourism industry, travel decision making is one of the most crucial aspects. According to Senanayake et al (2019), there is a relationship between the travel decision-making process and the

functionalities of social media. It is important to study the contribution of social media in the travel decision-making process. Because consumers are engaged with social networking sites to research trips, find destinations, explore new activities, find new information, compare budget details make decisions about their travels, and share their personal experiences of a particular hotel, restaurant, or airline with the community.

Research Problem

Social media analysis also existed in the early infancy of tourism. While case studies based on qualitative discussion of the effect of social media on tourism are required, it is important to promote a detailed analysis of the effects and impact of social media on every part of the tourism industry (Zeng, 2013). Worldwide, researchers have moved into identifying the impact of social media on the tourism industry. However, as a developing country still, Sri Lanka is new to using social media effectively. There are few studies relevant to social media and its usage. Further, there have been a limited number of studies focused on the travel decision-making process of travelers which is an important concept in the tourism industry. Accordingly, the following research questions are formulated and explored in the study.

1. What is the importance of social media in the pre-trip stage, during the trip and post-trip stage?
2. What are the influential factors that make tend on social media in travelers' decision-making process?
3. What are the most effective social media platforms that can be used to promote travel destinations in Sri Lanka? (from a Travelers perspective)

Literature Review

Rise of Social Media

In recent decades, evolution of computing and networking has changed way people lives and business operation (Shaqiri, 2015). The world of business has transformed from industrial economy to knowledge economy with the invention of technological solutions and internet usage. After first super computers were created in the 1940s, the revolution was started in the last half of 20th century.

One of the serious steps in IT was the invention of internet. Initially, scientists and engineers began to develop networks between computers, and later it has led to the birth of the Internet. As a result of this, World Wide Web (WWW) was invented by Tim Berners in 1990 (Evan Andrews, 2019) with the invention of internet, the world can be seen through our fingertips. And, 90s and 2000s decades are the most critical periods in the growth of internet.

Social media refers to internet-based applications with functions of sharing, relationship, group, conversation and profile (Kietzmann, Jan Hermkens, Kristopher Mccarthy, Ian P Silvestre, Bruno S, 2011). The advent of social media has revolutionized the individual's decision making and purchasing behavior. Social media become the key marketing tool for businesses to expand the market base and ease the transmission of information about product or service (Gretzel, 2009). According to research by Global Web Index, it shows Facebook as the most engaging social media platform. Nearly 60% of world population use social media which is nearly 4.80 billion people around the world. Therefore, it clearly demonstrates that social media plays a big role in current world of work and living.

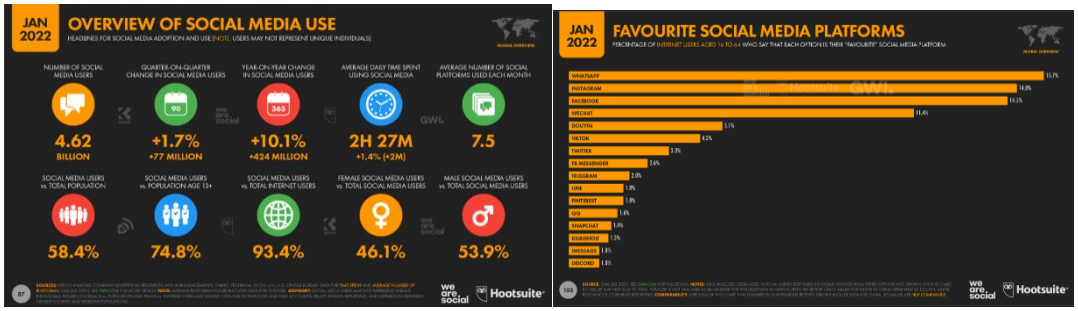

Figure 2: *Social media Usage & World's Most Used Social Media Platforms*
Source: Digital Global Overview Report, 2022

Social media Influence on the Revolution of the Tourism Industry

Tourism industry operations have witnessed the impact generated by social media implementation. Similarly, individuals' travel decision-making has revolutionized due to platforms like Facebook, Instagram, Twitter, and YouTube have transformed the way people gather information, plan, and share their travel experiences (Shyle & Hysi,2015).

"Social networking" has a high effect on shift travel patterns and experiences, as well as promoting tourism companies/destinations and their implementation strategies and tactics" (Leung, Daniel Law, Rob van Hoof, Hubert Buhalis, Dimitrios, 2013). In terms of how travelers view and use information has enormously changed and effect on purchasing behavior of consumers and the brand image of DMC (Destination Management Companies) and tourism service providers (Narangajavana, Yeamduan Callarisa Fiol, Luis Moliner, Miguel Rodríguez-Artola, Rosa Sánchez-García, & Javier, 2017). Moreover, social media is more productive in equipping travelers with detailed knowledge about tourist destinations and alternative information through platforms like TripAdvisor, Airbnb, Booking.com,

Expedia, etc. (Gretzel, 2009). The modern way of discovering, learning, building trust, and generating knowledge about tourism suppliers and destinations is ultimately transformed by social media into cost-effective and efficient for both travelers and local suppliers (Sigala, 2012). In contrast, social networking helps to generate E- word of mouth or called E- feedback after experiencing the destination which helps potential customers to plan vacation based on reviews of previous visitors (Tafveez, 2017). However, social media & Sri Lanka tourism-related research are rarely discussed.

Social Media Influence on Travel Decision Making

Decision making process is crucial for travel industry professionals and researchers to understand and enhance the travel experience by catering to needs and preference of travelers.

According to Briandana & Dwityas, (2017) Pre-Trip Stage consists of desire or motivation to travel and gathering information and evaluation based on aspect of their travel intentions and finally make choices regarding travel plan. During Trip stage occurs while travelers are at chosen location and making decisions actions through searching information to fulfill travel desires. Post-Trip stage occurs after travelers have completed their travel experience and return to home country. This may include uploading post and posting reviews and expose memories with friend and relatives. Finally, travelers preserve future travel plans based on level of satisfactory they experienced. In all phases, social media serves the tourism industry by being the key source of generating information and currently, the travelers are part of the process by creating User Generating Content (UGC) in social media platforms in more attractive way to influence potential travelers (Narangajavana et al., 2017). Since there are few studies undertaken in Sri Lankan context with reference to social media usage and tourism, this study investigates the delineate the impact

of SM networks on the travel decision-making process in perfective of the experience of university undergraduates who belong to Generation Z.

Methodology

This study depends on respondent's behaviors, knowledge, and responses on social media and travel decision-making. Hence, considering the objectives of this study, the researcher adopted a qualitative research approach. The population of this study consists of people who use at least one social media platform and the sample of this study consists of 25 undergraduates who are following hospitality and tourism degree programs in five different universities in Sri Lanka.

In this study researcher employed two sampling techniques to select the sample. In the first stage Cluster sampling technique was adopted to select 05 universities from different state and private universities that offer tourism degrees in Sri Lanka. Thereafter, the researcher chose individual respondents from the selected universities via a purposive sampling technique. In-depth interviews were conducted to gather primary data using a structured interview guideline and interviews were audio recorded after obtaining the prior approval from the respondents. Under phenomenological research design, content analysis was used to analyze data to achieve the objective of this research. Accordingly, interviews were transcribed and significant codes and categories were identified.

SN	Code	Age	Gender	Home Town	University
01	SUSL 01	25	F	Anuradhapura	Sabaragamuwa University of Sri Lanka
02	SUSL 02	24	F	Bandarawela	Sabaragamuwa University of Sri Lanka
03	SUSL 03	26	M	Gampaha	Sabaragamuwa University of Sri Lanka

04	SUSL 04	23	M	Jaffna	Sabaragamuwa University of Sri Lanka
05	SUSL 05	24	F	Trincomalee	Sabaragamuwa University of Sri Lanka
06	CINEC 01	22	F	Mathara	CINEC Campus
07	CINEC 02	24	F	Puththalam	CINEC Campus
08	CINEC 03	25	M	Ehaliyagoda	CINEC Campus
09	CINEC 04	23	M	Gampaha	CINEC Campus
10	CINCE 05	25	M	Awissawella	CINEC Campus
11	NSBM 01	25	M	Kirindiwela	University of Plymouth
12	NSBM 02	23	M	Nuwara Eliya	University of Plymouth
13	NSBM 03	23	F	Colombo	University of Plymouth
14	NSBM 04	22	M	Chilaw	University of Plymouth
15	NSBM 06	24	F	Negambo	University of Plymouth
16	RUSL 01	25	M	Eppawala	Rajarata University of Sri Lanka
17	RUSL 02	21	M	Rathnapura	Rajarata University of Sri Lanka
18	RUSL 03	25	F	Jaffna	Rajarata University of Sri Lanka
19	RUSL 04	24	M	Trincomalee	Rajarata University of Sri Lanka
20	RUSL 05	22	F	Batticaloa	Rajarata University of Sri Lanka
21	UWU 01	23	F	Kandy	Uva Wellassa University of Sri Lanka
22	UWU 02	27	F	Balangoda	Uva Wellassa University of Sri Lanka
23	UWU 03	24	M	Piliyandala	Uva Wellassa University of Sri Lanka
24	UWU 04	25	M	Badulla	Uva Wellassa University of Sri Lanka
25	UWU 05	24	F	Kurunegala	Uva Wellassa University of Sri Lanka

Table 1: *Profile of the Respondents* *Source: Survey Data, 2022*

Results and Discussion

To achieve the objective one of the study, it was necessary to analyze pre, during and post stages in travel decision making separately to gain a successful outcome.

At first, in the pre-trip stage, it was identified that social media unintentionally acted as a motivational factor in travelers' mindsets. According to the respondents' experiences, this motivational factor was inclusive of social networks and media-sharing networks. Networks such as Facebook and Twitter belonged to social networks while Instagram and YouTube belonged to media sharing networks. Further, social media to be an information source was also analyzed by the responses given by the participants.

"When I plan to visit somewhere I haven't visited yet, usually I intend to search it on social media. Most of the time I use Facebook & Instagram to gain additional information and to browse photos".

(NSBM 02, Personal Communication, 2022)

As the most prominent method of searching for information, it was identified that respondents engage with Facebook because they believe it to be a platform that offers real-time experiences of the users with regard to their travel. Facebook pages of hospitality enterprises have created trustworthiness for the respondents in making their travel decisions as they showcase the precise details of the location on the page itself. Moreover, during this pre-trip stage, it was widely explored that social media is a capable platform for communication purposes as well. The nature of this respondent category as per Dimitriou & AbouElgheit (2019) was more likely to travel with friends or with groups. According to the collected data, 58% of respondents were in favor of traveling with friends.

"Usually I have not traveled alone. Every time I travel, I do it with my friends or family or relatives. But mostly, we go on trips by creating a WhatsApp group earlier to discuss what needs to be done on the trip, etc.".

(SUSL 02, Personal Communication, 2022)

Most commonly, it was identified that the respondents were contemplated to share photos of the destination, accommodation sector, meal plan, routes and maps, and etc via most used social media platforms like WhatsApp, Messenger, Viber, Telegram, Skype, Imo, etc.

As per the findings, it was revealed that social media played a prominent role in the decision-making process of a traveler as a motivational factor, information source and communication method. Moreover, it can also be analyzed under a broader stage of planning; processing, decision making, copying, and anticipation.

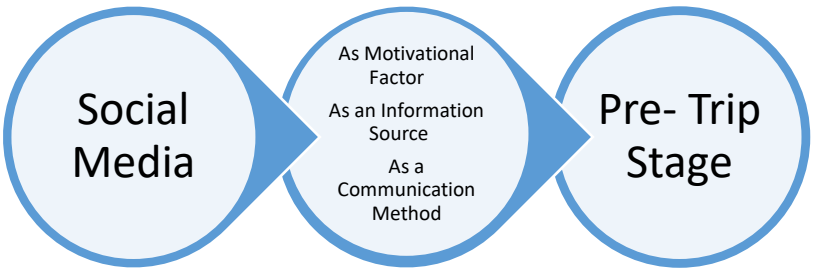

Figure 2: *Importance of social media in Pre-Trip Stage*

Source: Survey Data, 2023

Next, during the trip stage, most of the respondents mentioned that the use of social media was for the internet facility where they sought internet facilities to communicate the locations or destinations with their friends or family. It

was true that even in the pre-trip stage the respondents used social media for communication. But, during the trip stage the use of social media for communication was more likely to keep in touch with the family or friends to avoid getting lost and acknowledging the travel destinations.

During the analyzing of data, it was precise that the respondents used WhatsApp mostly, which was known to be the commonly used media platform to get connected with loved ones (Patmanthara & Febiharsa, 2019). Moreover, they tend to share their travel stories mostly in WhatsApp and Instagram to make their closest circle aware of their travel status.

"I usually share my experiences, by making reels, sharing stories, and making collages and uploading them to WhatsApp and Instagram".

(CINEC 03, Personal Communication, 2022)

Addition to that, respondents intended to engage in unplanned trips during their journey which they believed it as a source of discovering hidden destinations. Further, the major decisions like accommodation decisions, meal decisions, and the destination decision were taken during the trip stage.

In a nutshell, the importance of social media during the trip can be categorized as Connectivity, Navigation, Short-Term Decision-Making, and On-Site Transactions.

And finally, referring to the last phase of the travel which was the post-trip stage can be simply defined as the stage that heading back home and reflecting on the vacation. It was explored that everyone had a habit of uploading at least one capture from the travel on social media.

"I do upload photos and stories in Facebook and Instagram just like others after a trip. It looks like a diary so that I can see them in the future as a collection of my memories".

(SUSL 03, Personal Communication, 2022)

It was precise in data that the behavior of the respondents in the virtual environment was based saving the memories of the trip and influencing on other individuals' travel intentions.

"Normally after the trip I share the photos with each other and upload them in my personal accounts. Sometimes it has helped people who are willing to go on my visited destinations to gather information in the comments section and inbox".

(NSBM 01, Personal Communication, 2022)

It also appeared from respondents that they were performing evaluation after every trip. Some were doing content writing, video creation, reels, etc. The respondents who engaged with content creation in social media after the trip were identified as the ones who were enthusiastic with their travel. Further to that, social media was further used for the purpose of Sharing Documentation, External Memory, Re-experiencing, Reconstruction, and Attachment by the respondents in post trip stage.

As per the study of Matikiti-Manyevere and Kruger (2019), social media sites and trip planning could be impacted from information search through social media which was continuingly play a key role in decision making. The literature review showed that the information search stage (pre-trip stage) and experience sharing stage (after trip stage) were the most pre-dominant stages in which travelers use social media platforms. Platforms such as Facebook, YouTube, and Instagram were the most used platforms by the travelers during trip planning and Instagram was emerging out of them (Matikiti-Manyevere and Kruger, 2019). However, these three stages of travel decision making process were interviewed and analyzed separately in this study by the researcher to gain a successful outcome.

Findings of the second objective of the study which was to explore the influential factors that make tend on social media in travelers' decision-making process was analyzed under three categories which were benefits, uniqueness and, negative and positive factors of social media.

According to the figure 03 it showcased Facebook as the most popular social media platform that was utilized by the respondents in their decision making. Findings of Mariani, Styven, and Julian (2019) too proved it in their study the popularity of Facebook among travelers.

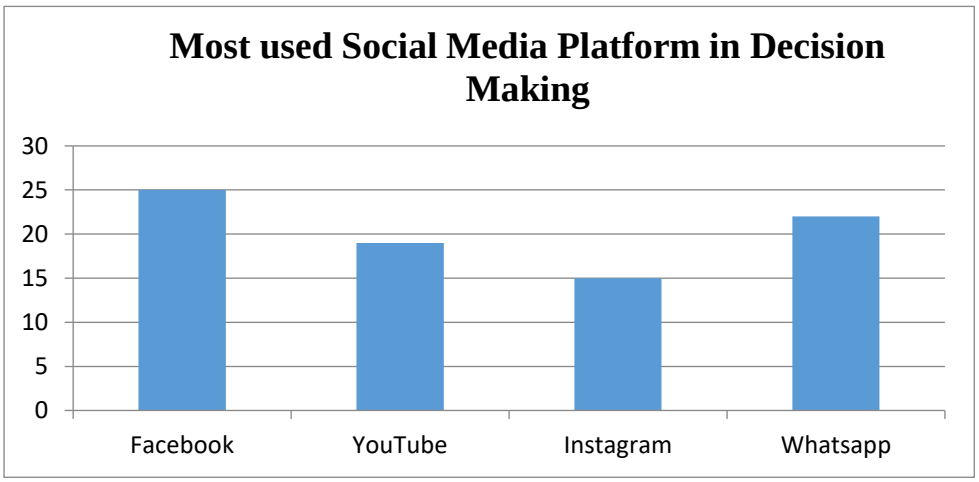

Figure 3: *Social media Usage of Respondents in Decision Making*
Source: Survey Data, 2023

Moreover, in 2018 the Pew Research Center survey of nearly 750 15- to 19-year-olds found that 45% are engaging online almost constantly and 97% of the sample uses a social media platform, such as YouTube, Facebook, and Instagram in their daily chores. Leading the fact, the study too provided some influential factors caused within the respondents to explore the benefits of

social media which made them tend to use social media for their travel decision making. Those benefits were explored under three sub categories which were ease of connectivity, building relationships and self-learning. Under ease of connectivity, it was identified that respondents tend to build trust on social media accessibility to information when they were far away from their home environment. In deciding a novel destination to visit, they tend to accept the results given by social media users at that very moment just because of ease of connectivity.

"As an Information source I usually use Facebook out of other social media platforms as it is readily accessible to gain information from relevant Facebook pages though I don't know the crowd personally".

(SUSL 03, Personal Communication, 2022)

Moreover, it was explored that building relationships in social media led to share the exact experience of a location or an activity with all pros and cons. Similarly, by gaining information from social media, it also played the role of a relationship builder among people with simple set of ideas and thoughts. Social media could be a platform beyond connectivity which vividly allowed respondents to seek for the people with same mindset which deliberately let them to gain accurate destination decisions in making memories (Matikiti-Manyevere & Kruger, 2019). As per the findings of the study, it also revealed that nowadays people take the risk of getting connected to strangers yet social media was believed to be a platform that allowed the respondents to spot the ideal set of people when making their travel decisions.

Technology, education, literature, art, and tourism can now be explored within fingertips with a smart phone in one's hand. Majority of respondents confirmed that the knowledge gained for several years through social media

by themselves activated a strong desire to choose social media for their decision making. As per the findings, it was clear cut that social media has a tendency for people to rely on information after a browse by their own rather than depending on phone calls and reviews in websites. As stated by (Huang, Hong and Burtch (2017)**,** use of social media allows a user to find information readily as each platform states argumentative results shared by other users. Diversified experiences and thoughts shared by rest of the social media users allowed the respondents to make decisions through gather variety of ideas. Therefore, explicitly this study's findings too revealed the tendency of the respondents to make their own decisions through self-learning which has led them to intentionally engage with social media in gaining information.

Moreover, the uniqueness of social media was analyzed by three sub categories; audience level, direction connection and variety of platforms. The findings of the study stated that to learn different cultures and religions social media played a main role. Even though the travelling couldn't be performed, the respondents stated that the experience could be gained virtually. Referring to the direct connection, it was explored that the use of comment sections, inboxes of vloggers and reviews on pages allowed the respondents to build a discussion with social media users in each platform to make their travel decision. This characteristic of social media has influenced travellers in making decisions prior to the visit (Tham, Mair, and Croy, 2020). Proving the fact, this study revealed that the respondents also engaged in those sections of social media to enhance their engagement in gaining an accurate detail about a destination or an activity. Further to that, through variety of platforms, it showcased the purpose of the respondents in travelling to a destination could be varied.

"When I search for user experiences in Instragram sometimes I don't get the real experience I wish to gain. But, Youtube vlogs are my favorite where I gain the real time information of a location I wish to go".
(RUSL 03, Personal Communication, 2022)

Likewise, it can be stated that each and every platform operates in a different manner which would influence the user differently. A growing use of social media was seen growing during the analysis of data of the study. The findings revealed both positive and negative facts which directly influenced the respondents' travel decision making.

"Sometimes the location's beauty in social media is exaggerated".
(NSBM 02, Personal Communication, 2022)

Respondents' experiences disclosed that the nature of the destination is over rated in social media. Sometimes, the real time experiences of travelers were not shared as it was, according to the respondents.

"But I choose travel vlogs of travel with wife and solo traveler all the time because they give real time experience".
(NSBM 02, Personal Communication, 2022)

As per the respondent, it was clear thought there are negative impacts of social media, the usage of social media in travel decisions were always admired. At last, according to the findings of the study, it can be stated that the user content of social media positively influenced the respondents to use social media platforms for their travel decisions though the negative impacts exist. It turned out that, negative impacts of social media were not much cared or taken into account by the travelers when making the decision as vlogs and blogs in

Facebook and YouTube influenced respondents to make the move in decision making.

Despite the unique characteristics of social media, the respondents clearly mentioned only three main points which cannot be taken or presented in traditional media. Thus, those characteristics mentioned can be illustrated as follows that tend them their use of social media in their travel decisions.

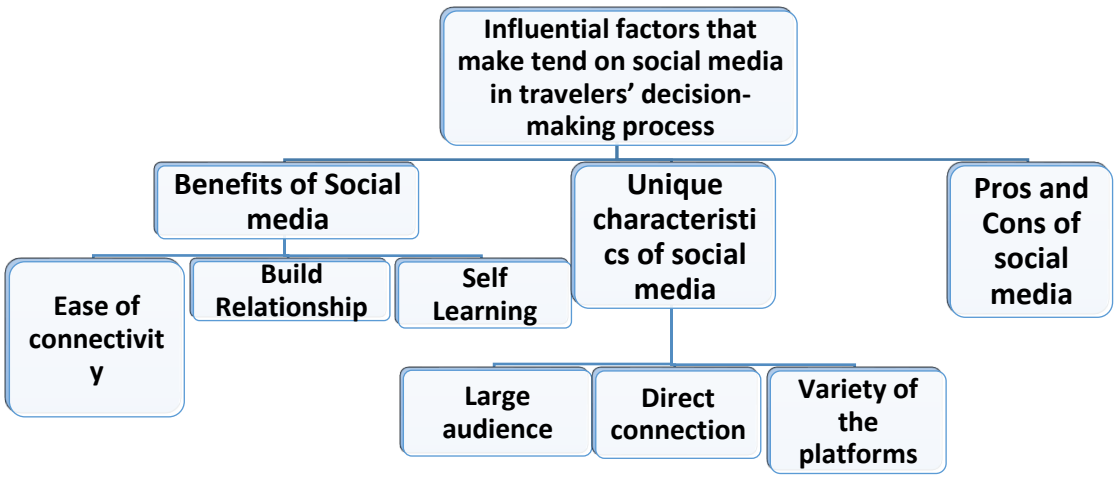

***Figure 4**: Influential factors of social media that tend travelers for their travel decisions* *Source: Survey Data, 2023*

It was significant the attentiveness of the respondents of the study in promoting travel destinations they visited for awareness purposes of other existing travelers in social media to gather information. Hence, objective three of the study which was to identify the most effective social media platform

which can be used to promote travel destinations in Sri Lanka from tourist perspective revealed the following results.

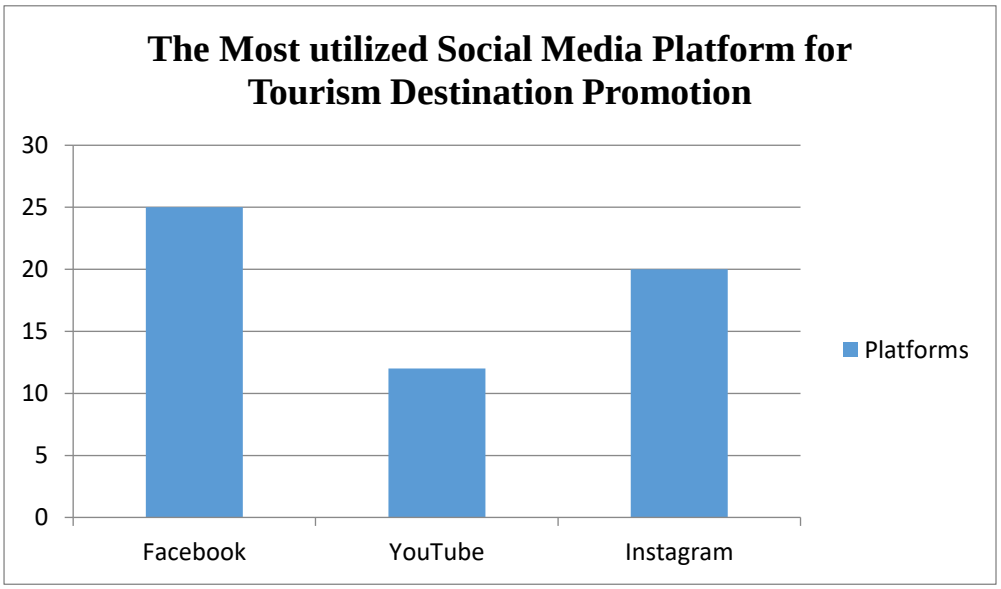

Figure 3: *Top three platforms used for destination promotion*

Source: Survey Data, 2023

Facebook was explored to be the most popular type of social media platform the respondents tend to use in promoting Sri Lankan destinations for user visibility. Further, the respondents asserted these three platforms to be the big three in social media when it comes for the tourism industry. A study, "Tourism destination marketing using Facebook as a promotional tool" conducted by Shahnoor Rahaman stated, "Among the varied social media platforms, Facebook deserves a special mention with regard to promotion of a tourism destination. Facebook offers travel brands the ability to identify prospective travellers, communicate directly with users, engage with advocates and create branded experiences through advertisements and custom-developed Facebook applications" (Rahman & College, 2017). Proving the

fact, the study's findings too showcased the tendency of the respondents to engage with Facebook specifically to gain information as well to promote novel destinations for other travelers for awareness alongside with increased visibility.

As per the findings of the study, the content of social media delivered the importance under three main stages of travel decision making process and the factors why people tend to use social media in their travel decisions. Succinctly, it can be concluded social media as the most effective source utilized by Sri Lankan young travelers for destination promotion.

Conclusions & Recommendations

In today's digital age, the influence of social media transcends boundaries and impacts various industries across the globe. It has become an integral part of marketing and communication strategies for industries as diverse as automotive, politics, entertainment, tourism, and hospitality. One sector that has felt the profound impact of social media is the travel and tourism industry. The travel decision-making process is a pivotal aspect of this industry, as it determines where people choose to visit and how they plan their trips. This study sought to delve into the effects of social media on this decision-making process.

The research uncovered three distinct stages of the travel decision-making process: the pre-trip stage, during the trip, and the post-trip stage. Each of these stages was significantly influenced by social media, and several factors emerged as influential in guiding individuals to use social media for their travel decisions. The three primary categories of factors are benefits, unique characteristics, and the pros and cons of social media. The benefits of social media were highlighted by respondents, who stressed the ease of accessibility

to travel-related information through platforms like Facebook, Instagram, and YouTube. Travelers appreciated the flexibility and real-time updates that social media provided, allowing them to make well-informed decisions.

For both travelers and the travel industry, there are several recommendations to maximize the benefits of social media. Travelers should diversify their sources, actively engage with others, prioritize authenticity, and exercise caution when verifying information. The travel industry, in turn, should diversify platforms, invest in visual storytelling, leverage user-generated content, embrace interactivity, make data-driven decisions, and collaborate with influencers. By understanding the influential factors and adopting these recommendations, both travelers and the travel industry can make more informed choices and effectively promote destinations,

Generally, social media plays an indispensable role in influencing travel decisions. It serves as a dynamic platform for information sharing, inspiration, and peer recommendations. Travelers and the travel industry, by understanding these influential factors and selecting the right social media channels and strategies, can make more informed choices and effectively promote destinations. The impact of social media on the travel industry will continue to evolve, making it imperative for all stakeholders to adapt and harness its potential for mutual benefit.

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Reconstruction of The Historical Landscape of Colombo with Archaeological References.

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Abstract

There are several theories as to how the name 'Colombo' came to be. During the Middle Ages, it was known as 'Kolontota' in Sinhala and 'Calenbo' by the Arabs. The Chinese explorer Chan-ta-yuan referred to Colombo as 'Kolanapu,' a hot swampy city, in the 14th century, and the Arab explorer Ibn Battuta, who visited Ceylon in the same century, described Colombo as a beautiful, large city. Researchers of the present study adopted the mixed approach to accomplish the previously explained research objective which was setting a proper reconstruction of the historical landscape of Colombo with archaeological references. The research was conducted with the support extended by the National Museum and the survey department in Sri Lanka. Researchers went through all the maps and archaeological landscape evidence mentioned in previous archaeological research like Archaeological Geophysics. The results were listed down as periodical landscape changes and how the changes happened vertically from the Colombo prehistoric era until the Kotte period, Colombo during the Portuguese period, Colombo's landscape at the conclusion of the Portuguese period, and Colombo's Dutch period.

Keywords: *Archaeology, Dutch, Landscape, Portuguese, Reconstruction*

Introduction

There are several theories as to how the name 'Colombo' came to be. During the Middle Ages, it was known as 'Kolontota' in Sinhala and 'Calenbo' by the Arabs. The Chinese explorer Chan-ta-yuan referred to Colombo as 'Kolanapu,' a hot swampy city, in the 14th century, and the Arab explorer Ibn Battuta, who visited Ceylon in the same century, described Colombo as a beautiful, large city. Although there were many Abyssinians in the city, the Arabs had the upper hand in the trade. He was known as 'Kalenpu,' and he traded in timber, silver, gold, and liquor. It appears to have adapted to Persians. The phonetic adjective "Colombo karalu anipan sada piyavi nam" is used as an example of a derivative word derived from the name of Colombo, which is taken from a foreign language, among the earliest expressions of the 14th-century Sidath magazine. As a result, the name 'Colombo' may have been in use since the Dambadeniya Kingdom. Later, 'Colombo Port' may have been referred to colloquially as 'Colombo,' and in Rajavali, it is referred to as 'Kalantota.' The name is thought to have come from the Kolon Oya, which separates the Kelani River. The streams along the Kolom Oya turn the land around Colombo into a swamp, and are located as the water fort on the western side of the Kotte Fort. It also connects with the Kelani River near Colombo. As a result, ‘surrounded by the Colombo Oya' might refer to later Colombo. Anyone who examines the origin of Yai Pali terms can explain why Colombo is shattered due to this Colombo Oya. Kolon Oya is also known as 'Colombo River' or 'Colombo Halaka' in Pali history literature. Gokannathota, Mathota, Kalukota, Ambalantota, and Bentota were formed from the island's major rivers. Since ancient times, the sources of business in the Colombo area have been a mingling of various ethnic groups. The words 'Colombo' and 'Colombo' were used by Europeans, especially the Portuguese. According to Robert Knox, a Kandyan prisoner in the 17th century, the name comes from a green mango

tree west of Colombo Fort. He claims that western nations utilize Columbus as a tribute to Columbus. The mango tree at the edge of Colombo Fort was also utilized by the Dutch as a symbol of the flag signifying their Colombo area. Its birds are likewise shut. 'Columba' means 'dove' in Latin. They consider the scorching green mango tree to be. They consider the glowing green mango tree to be a signpost in the distance.

Methodology

Researchers of the present study adopted the mix approach in order to accomplish the previously explained research objective which was setting a proper reconstruction of the historical landscape of Colombo with archaeological references. The research was conducted with the support extended by the national museum and the survey department in Sri Lanka. Researchers went through all the maps and archaeological landscape evidences mentioned in previous archaeological researches like Archaeological Geophysics. The museum curators and survey department were considered as the population of the study from which a sample of 10 members were extracted through convenience sampling technique through questionnaires consisted with both close ended and open- ended questions. Semi-structured interviews were also conducted. Secondary data was collected from reliable websites, articles and previous research. Papers relevant to the key words of this present study. Frequency measurements of descriptive statistics and content analysis method were followed to analyze the collected data to make conclusions.

Results and Discussion

01. From the Colombo prehistoric era until the Kotte period

Colombo's antiquity stretches back to about BC, according to archeological and historical sources. It has been shown that it extends into and beyond the era. The Asmadalagala cave complex near Akarawita, Hanwella, has been recognized as an ancient human village, according to excavations conducted in 1997. Cry in Pilapitiya, a community on the banks of the Kelani River about 4 kilometers from Colombo. BC There have been prehistoric settlements discovered dating back to the sixth century. Clay pots from this era have also been discovered at Dharmapala Mawatha in Colombo 07. Furthermore, investigations at the Rarana and Alawala caves near Colombo have yielded a variety of significant archaeological relics, including prehistoric and prehistoric human bones. The trawler discovered at the bottom of the Kelani River dating from the 4th - 2nd centuries BC is a monument to the trade that took place along the rivers from the interior of the country to Colombo. As a result, it is obvious that the early settlements in Sri Lanka were extended to the suburbs of Colombo. That town may have gradually extended upstream from Colombo through the Kaduwela Hanwella in the Kelani River valley.

In such a case, BC. The famous 'Taprobane' map made by the Greek Claudius Ptolemy reveals that Colombo was well-known by the 2nd century. Its Colombo neighborhood is known as 'Zeus Point.' The ancient religious places of worship around Colombo include the Kaduwela Korathota Cave Temple (2nd century BC) and the Hanwella Ambulgama Temple (2nd century BC). The Korathota Vihara, which also has two stone inscriptions in Brahmi script, is significant as a site from the oldest historical period. Cave Cree Hanwella Akarawita Alagala Hanwella Akarawita Alagala Hanwella Akarawita Alagala

Hanwella in the third century, it was converted into a Buddhist monastery. At the same period, the Warana and Pilikuttu areas near Colombo were converted into Buddhist monasteries. According to legend, the Kelaniya Rajamaha Vihara near Colombo dates back to the reign of the Buddha. According to legend, there was a significant population of Naga tribes in Kelaniya during the Lord Buddha's third visit to Ceylon. There is also Cree. BC The Mahavamsa also cites a kingdom founded in Kelaniya in the second century that was controlled by King Kelanitissa, the father of Goddess Vihara Maha Devi. With the expansion of Islam in the 8th and 9th centuries, the city of Colombo became increasingly popular in the Arab trade world, and the number of Arabs who arrived here expanded tremendously. Cry when an Arab priest is laid to rest. ඒ. In Colombo, a 10th century tombstone inscribed with the letter 'Kufit' has been discovered. The Muslims in this country brought the cleric 'Ibn Abu Bakr' from the Caliph of Baghdad to perform their religious responsibilities. Muslims known as 'Marakkala' and 'Hamban' had arrived in Colombo by the 14th century to trade in textiles, cinnamon, ivory, gold, silver, pearls, and stones. Colombo became an important port in the South Indian region as Arab-related operations expanded.

By the 14th century, Colombo had become such an important port during the Gampola period that the Aryan monarchs who were controlling Jaffna at the time switched their attention to this area and invaded the western shore. Colombo fell under the control of the Aryan monarchs as a result of this. It is stated that the Aryan emperors took over the revenue of the western ports, including Colombo, which had previously belonged to King Gampola, since they kept a navy here to collect taxes. To repel the invasion of Jaffna, Alagakkonara alias Nissanka Alakeshwara, a nobleman of King Wickramabahu III who controlled Gampola, established the fort at Kotte.

Colombo's port, which was significant for foreign trade, was around six miles long and could be traded across the river from Kotte. One of the key motivations in the selection of Kotte for the construction of the fort was the ease of defending the port of Colombo, which was regularly taken by pirates. As a result, Colombo was the largest fort in use in Sri Lanka at the time.

In 1409, the then-chief of the Kotte, Weera Alakeshwara, was arrested and brought to China from Colombo after a disagreement with the Chinese general Wen Ho, who had arrived in Ceylon. Beginning in 1415 AD, Colombo was the primary port of the Kingdom of Kotte, and the taxes collected from it were a key source of money for the Kingdom of Kotte. Swamps and jungle villages surrounded the densely populated port city. Even as the Portuguese reached me in the early 16th century, the Outer Fort area was still a jungle. Elephants can also be found here. According to historical records, there were marshes in some areas, as well as broken rings in the middle. There was only one route in the Pettah area by 1505. It is also reported that the road is narrow and frequently muddy. According to legend, elephants used to travel long distances by digging big holes in the path.

02. Colombo during the Portuguese period

The arrival of the Portuguese had the greatest impact on Colombo's contemporary history. When Lorenzo de Almeida, the son of Goa's Portuguese lord, arrived in Ceylon in November 1505, Colombo was a popular port and market. At the Colombo Fort ceremony, the Portuguese symbol and cross were carved on a rock in the bay to commemorate the historic trip that began after the then-heroic King Parakramabahu VIII of Kotte committed to trade and defend Colombo. For protection, the bay's tip was named after a saint, St. Lawrence. To celebrate the capture of Colombo, a special ceremony was organized in Rome under the patronage of the then Pope. The Portuguese

designed Kolonnawa's original city plan. The initial fort was a modest wooden building covered in paint. St. Lawrence was the name of the first church established there. It also housed a warehouse. They also hired to protect the cinnamon trade in Kolonnawa from there. There were coconut groves and marshes outside the fort, as well as dwellings, roadways, and storehouses. Outside the fort, the Portuguese's usual commercial adversaries, the Arabs and the conflicted Sinhalese monarch, could not take sides for long. This was exacerbated by the fact that the Portuguese, who had established power in India, required control of the island's ports to preserve that status, protect themselves, and pursue commercial goals.

Thus, in 1517, the Portuguese commander arrived in Colombo with 17 ships and met with King Vijayabahu VII of Kotte in order to capture Gerry's advantage and let him to build a storehouse on the area. When Gerry received the skin cover and claimed ownership of it. The next deceptive strategy was to construct an artillery fortification of kabok and limestone at the mouth of the Colombo harbor overlooking the Gulf, rather than a storehouse where products, including cinnamon, might be tasted. This was known as 'St. Barbara' or 'Black Fort.' The first church in Ceylon built by a western nation was built in this fort. They dubbed it the Yanka Lawrence Church. Because of frequent skirmishes with Islamic merchants, the Portuguese launched artillery fire from this location, destroying many of their markets, homes, and lives. In this context, Colombo Fort was rebuilt between 1521 and 1524, and the defensive line was enlarged. Lapo de Buto and his forefathers, carpenters and soldiers, landed in Ceylon in 1521. Brito's goal was to build a fort wall to divide the area that is now used as a fort and a fortress. The wall was constructed of granite and was protected by a moat and a wall. When the Parangis were constructing the fort previously, they had difficulty obtaining

lime mortar. As a solution to this difficulty, the shells gathered on the shores of Arippu were transported to Kolomiko by 'Sampan' ships and burned, while lime was acquired on the ship itself.

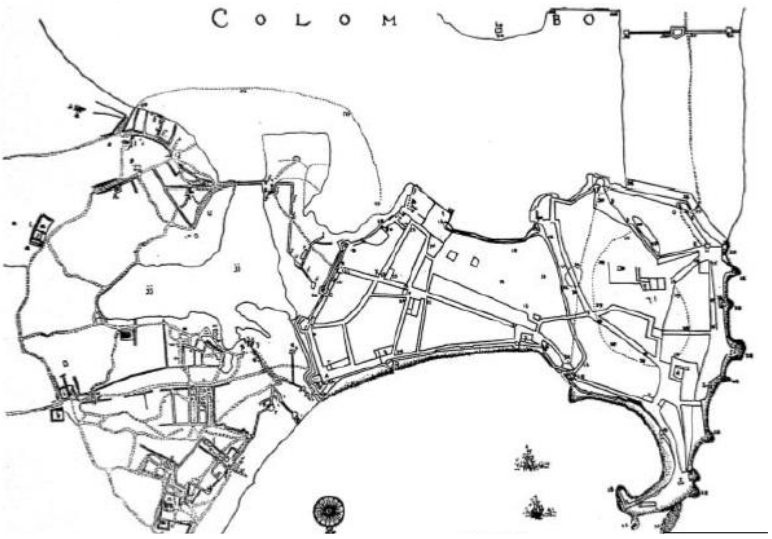

Figure 01 - *Portuguese-era Colombo*

The rampart was three miles long and made of stone, mud, and wood. It was triangular in shape and stretched from the Cayman Gate to the Face of Time. After a period, artillery was stationed on several sides of the fort. On the wall was also the ammo depot. Houses, stores, hospitals, churches, and a prison were built within the fort. The 'St. John' River was utilized to redirect water from the reservoir generated by the flow of water eastwards towards the sea. This was utilized to create a deep moat. As a result, the river aided in the prevention of land invasions. It ran through the location where Gaspaha Street now runs. Many conflicts had place in the Colombo area between the Portuguese and the Kingdom of Kotte. The first battle took place in Modara, Colombo, between King Mayadunne of Seethawaka and the Portuguese. The Portuguese were completely beaten after a violent battle between King

Seethawaka Rajasinghe and the Portuguese at Mulleriyawa in 1561, and approximately 125 of the 1600 Parangi warriors departing Colombo returned to the fort. From 1565, when the Portuguese abandoned Kotte due to constant raids on the fort and came to Colombo Fort with King Dharmapala for security, Colombo Fort was designated the capital. King Dharmapala's body, which died in 1595, was buried at St. Francis Church in Fort.

From 1587 to 1588, King Rajasinghe of Seethawaka encamped with a 50,000-man army in the Rajgeri and Maligawatte hills in order to capture Colombo Fort. Even after 22 months of combat, with the army and troops draining a canal from the Colombo tank, the fort could not be conquered. The Portuguese defended the fort with 237 external assault weapons, 12 forts, and six gates. King Senarath's troops besieged the Colombo Fort once more in 1630. They came through Malwana Biyagama and established camps at Kaduwela, Nakolagama, and Kotalanga. Dom Almeida's army beat the Kandyan army and drove the Portuguese out of Colombo with the support of Goa.

03. Colombo's landscape at the conclusion of the Portuguese period

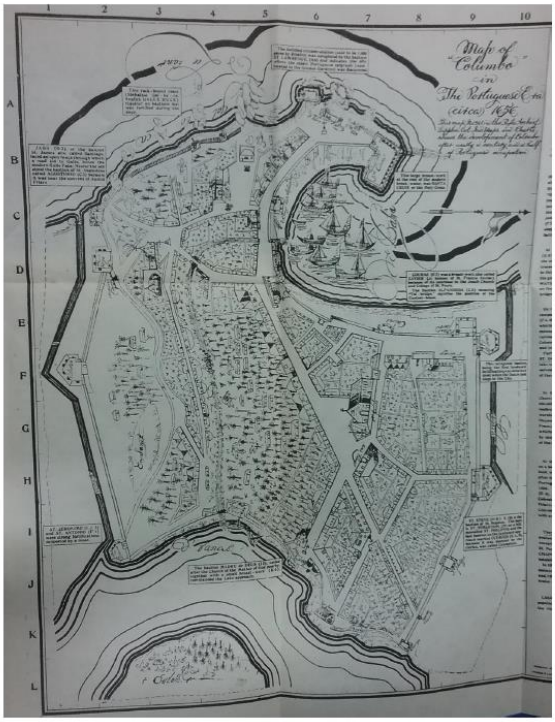

Figure 02 - *1656 Map showing the peak of the city of Colombo under the Portuguese*

The paintings of 1656, which depict the peak of the city of Colombo under the Portuguese, provide a good understanding of the landscape of the time. A dozen war towers surrounded the fort at the time, each with its own rampart. It was surrounded by 10 moats. Colombo Fort was bounded on the east by a kibbutz-filled tavern and on the west by rocky rocks known as Gal Bokka. When looking at this map, the first thing that comes to mind is the large number of churches and other religious structures that are crammed into this small space. This building complex, together with the long-standing policy, is a strong monument to the Portuguese policy of spreading Catholicism.

'Rio Directo,' or Main Street, was the name of the main street in this Portuguese city. This street is the starting point for the straight street that connects the forts. It gradually grew to include a slew of stores erected around it, connecting it to the North Green Network. Today, St. Paul's Church is a short walk down this street. It is based on Corinthian architecture from the 16th century. The City Hall stood in front of this chapel. St. Dominic's Church, located near the end of the spiral to the open bay, is nearby and built-in significant Gothic style. This church was next to the Dominican convent. Adjacent to the Portuguese Governor's or Captain General's office. Near these houses, there was also a promenade. It is now known as Republic Square. The Austin Priests' Church was nearby.

St. Francis Church, dedicated to St. Francis, is located at the city's highest point, on the promenade known now as Gordon's Park. A Portuguese-era prison was eventually demolished to make way for the Police Hospital. Vidye Bandara was also imprisoned in the same facility. He escaped at the request of his son, Prince Dharmapala, by excavating a tunnel with the assistance of church priests and the deity Samudra. The oldest church in the Portuguese, St. Lawrence's Church, was positioned near the beginning of the new breakwater. The churches in the area are as follows. One of these is St. Augustine's Church. Madre de Dios, the current location of St. Philip Neri's Church, will become another church dedicated to Jesus' Mother tomorrow. The parish church and Bishop Covinci's house were also nearby. This is close to the canal leading to the Colombo Lake harbor. The convent was situated on the lake's edge.

A vast battleground was located in the eastern fort's corner. It was named St. John because it rose above the harbor. A path was indicated by the little gate next to it. It is the road that connects Kolokota to Negombo. There were two

more entrances. Putare Mapane, or Mapane Gate, was one of them. This gate also leads to a trail in the suburbs. That's the route that connects Colombo to Galle and the other forts in the south. The Put Water was the name given to the last surviving gate. It was open to the sand. It could only be penetrated by water. It stood on the site of the former passenger jetty. Even after all the other doors had been closed and the keys had been locked, this door was used. This was a unique feature of the network site. That is, only one person at a time may enter. It can also be found in the pelvic girdle. It is a technique employed to keep intruders out of the box. Furthermore, the Aroya Hall, which is located opposite to the fort wall near the network entrance, is an important remaining institution to be mentioned. The ammo stockpile was another crucial place. This warehouse was the location of the current Lake House, which was built on ground protected by a lake. According to the records, two quintals of ammunition are made here every day from lake water. The Portuguese had built a series of tiny regional units named Paris in Modara, Aduruppu Vidiya, and Grand Pass, north and east of the Kelani River, beyond the defenses, by this time. With the progressive creation of estates in these areas, retired Portuguese commanders and warlords settled. In the region now known as Jawatte, there was a well-known chapel and farm belonging to the St. Augustine cult, complete with large cottages. In the Hulftsdorp region outside the fort, a church was also built on a hill near Aduruppu Video.

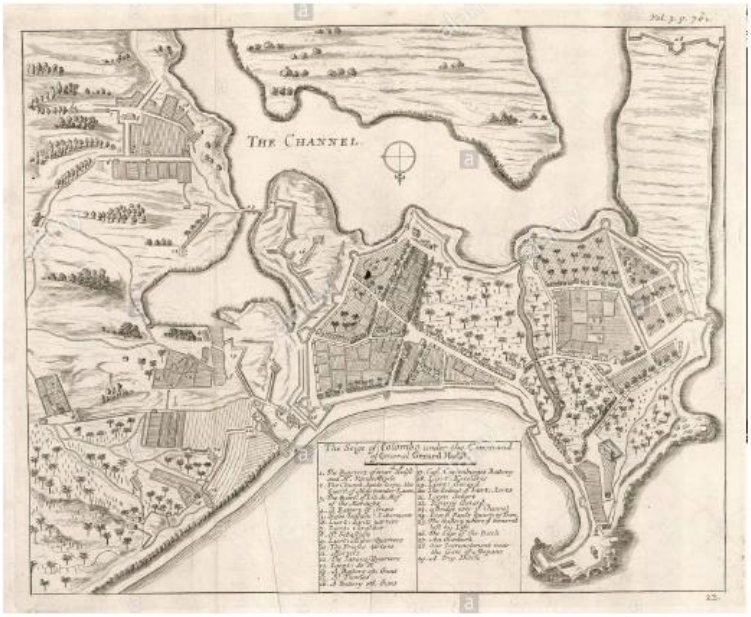

Figure 03 - *Colombo under the Portuguese*

04. Colombo's Dutch period

After a long and bloody fight, the Portuguese fort at Colombo surrendered to the Dutch in May 1656, thanks to King Rajasinghe II's assistance. During Dutch administration, the Portuguese churches in Colombo were destroyed. One such damaged structure is St. Francis Church. The metal bell that was installed there is supposed to have afterwards been installed on the gantry tower near the Cayman Gate. The Dutch demolished churches, governmental buildings, and dwellings in the Colombo area. The Portuguese fort of Colombo was entirely demolished, and portions of it were removed and used to build a new Dutch fort. It is estimated that it took approximately 20 years. The fort's construction was completed in 1690. This was a massive undertaking. Due to the country's affluence, the Batavian authority only

permitted the construction of the inner fort according to the original plan. Under these conditions, the Dutch fort was only one-third the size of the Portuguese fort at Colombo. It runs parallel to what is now known as Colombo Fort. The Great Sea formed its western and northern limits. The star-shaped Dutch fort had nine watchtowers. Strong fortifications added to the security. Around the fort, trenches were built and filled with water from the Cologne River and the sea.

War forts were given the names of their home cities. Lacedon, Date, and Horn were the names of the battlefields on the eastern boundary. The southern frontier battlefields were known as Rotham, Meilberg, Klippenberg, and Enquisen. Meanwhile, to the west, the battlefields of Dan Braille and Astordam were located. At Battenberg and Waterpass, two rows of cannon were built to launch an onslaught from the sea. An artillery line is a cell in which artillery is positioned against a wall. This construction lacks the distinctive shape of a battlefield. These were located outside the fort but were linked to the main fort by two rows of walled store huts. The Buffalo Plane or Buffalo Building was a desolate plain opposite the fort's eastern perimeter, also known as Carls. It's a coconut beginning. This build was used for security purposes. A sluice installed to drain the water might be used to submerge the tank. In the fort, new streets, houses, warehouses, and hospitals were constructed. The fort was expanded and

Figure 04 - *Dig moats around the box and fill them*

guarded while certain parts of the tank were filled by cutting the canal between Colombo Lake and the new fort. De Beer, a Dutch engineer, later became known as 'Beira Lake.'

The Dutch constructed three gates to allow access to this fort. The Delft Gate, which opens to the east, is one of them. The Galle Gate was to the south, and the Water Gate was to the north. The Deft Gate opened from the eastern ramparts between the Delta and the Horn Fortress to Pettah, the populous region. To get to the fort from Pettah, cross the movable bridge over the moat and enter through the deep gate of the tunnel, which was a tunnel through the Great Wall. In the event of an outside attack, a detour to enter the fort was used to prevent a direct attack on the fort. On either side of the gate, there were watchtowers. The Dutch defensive ring was breached, and no attacker ever entered. But it was once entered by a mysterious stranger. On November 27, 1751, around 2 a.m., a wild elephant with tusks breached the city gates and raced into the city. This episode was so significant that it was included in the official Colombo report, which documented all of the significant events that occurred in the fort. By 5 a.m., a number of persons had been forced out into the sea off Mount Rasa Point, where they had been baptized on land that protruded southwest of the breakwater. This incident also depicts the topography of Colombo at the time. This demonstrates how densely forested the city was to the north, east, and south. There were scattered communities and fields in the heart of the bush. Outside the fort, coconut was grown. Houses were typically built on the fort's edges, known as the Outer Fort. It came to an end at the Cayman Gate. There were routes leading from there to Negombo, the upcountry, and Kotte. During this time, numerous stores in Pettah were built in the Dutch style. The Dutch and Burghers erected their homes in the then-quiet districts of Modara, Mattakkuliya, and Kotahena. The Dutch built

Nfandol Church on the ruins of Francis Church in 1749. At the time, it was a prominent religious center in Colombo. Due of the difficulty of acquiring cinnamon from the uplands, the Dutch began producing cinnamon in the lowlands, and Colombo Cinnamon Hill was one such cinnamon growing region. This cinnamon estate is now distributed not only in Colombo 7, Aswattu Junction, but also in locations such as Borella and Maradana. During the Dutch period, vast coconut estates were also constructed in Colombo. Kollupitiya has a lot of coconut plantations.

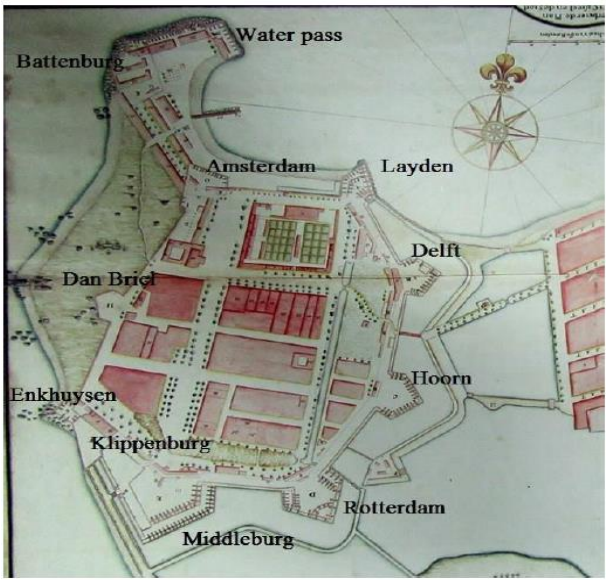

Figure 05 - *War towers in Colombo Fort*

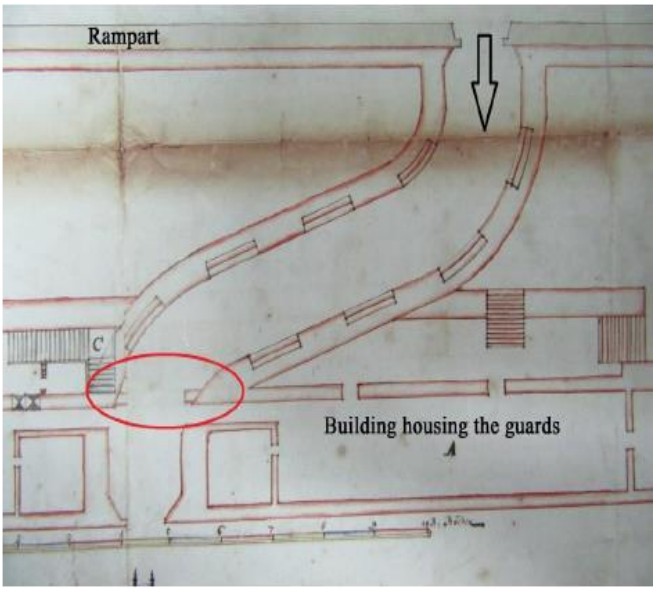

Figure 6 *- Plan of the Deft Gate drawn in 1690. The black arrow here indicates entry from Pettah. The red circle shows the remnants of this gate today. The curved path is clearly shown here.*

Conclusion

Colombo Fort, which had been finished by 1690, was occupied by the British in 1796 for extensive renovations. They did, however, stick to the original Dutch concept, making the necessary repairs over time. However, as the city grew for commercial interests, it was decided in 1869 to demolish parts of the fort to make way for it. Colombo Fort was completely demolished as a result of the works that took place with it, and today the remains of the fort may be seen in around seven sites. The maps and illustrations below depict these components.

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Subject Index

Appendix 01

TRIVALENT

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Journal of Archaeology, Tourism & Anthropology

Department of Archaeology

University of Kelaniya

Sri Lanka

Volume IV *Issue I* *2023*

About

The Journal of Archaeology, Tourism & Anthropology is to provide a platform for researchers and professionals to publish their research findings, theoretical overviews, models, and concepts related to Archaeology, Anthropology & Tourism & Cultural Resource Management with a multidisciplinary research approach. This is an interdisciplinary, open-access journal that is exclusively devoted to the publication of highquality research in the fields of Archaeology, Anthropology & Tourism & Cultural Resource Management. The Journal focuses on new trends in each field.

Intentions & Scopes

The academic journal of Archaeology, Tourism & Anthropology is the official journal of the Department of Archaeology, University of Kelaniya, Sri Lanka. The

journal provides a platform for researchers and professionals to publish their research findings, theoretical overviews, models, and concepts related to relevant fields of Archaeology, Anthropology & Tourism & Cultural Resource Management. Further, the journal encourages collaboration by teams of researchers to create special issues on the latest developments in related topics of national and international importance.

The peer-reviewed journal publishes one issue annually & invites original research articles from diverse disciplines. In addition to original research articles, the journal invites review articles, book reviews, and short communications.

Overview of the Department of Archaeology

Archaeology has become a subject field of studying human culture through human activities beyond a mere appraisal of past cultures & societies. The application of new knowledge & secrets of human history uncovered through that scientific study is the main aim of archaeology. Based on the multidisciplinary & multivocal concept of archaeology, it is an internationally connected subject via likes Tourism & Cultural Resource Management. The department offers a student-centered learning system by instilling in lectures a series of practical skills in fieldwork & research.

Themes

1. Pre & Protohistoric Archaeology
2. Mortuary Archaeology & Social Archaeology
3. Environmental Archaeology, Geoarchaeology, Zooarchaeology.
4. Ancient Art & Architecture, Ancient Technology, Epigraphy & Numismatics.
5. Recent trends in computer applications in Archaeology
6. Field Archaeology & Settlement Archaeology.
7. Archaeological Research, Education, Training & Public Archaeology
8. Underwater and Maritime Archaeology
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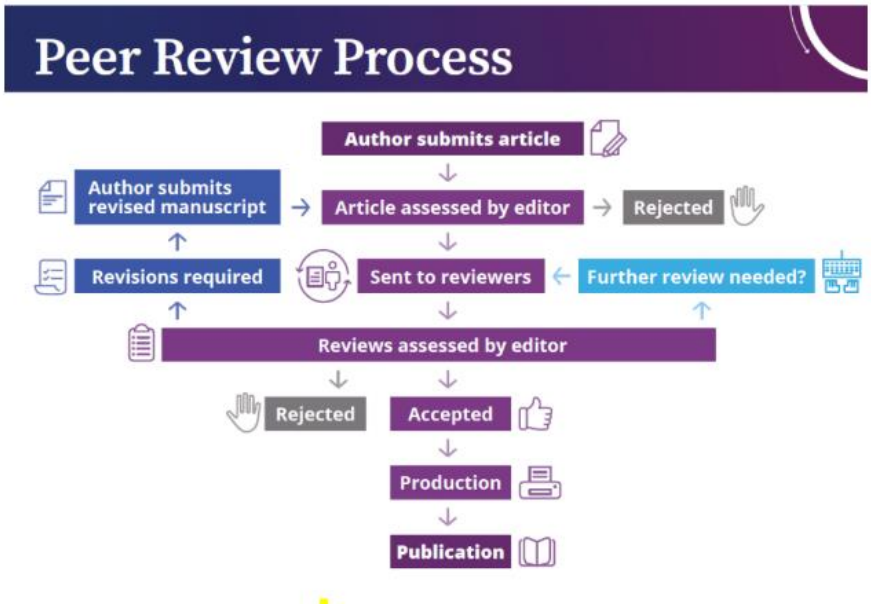
14. Tourism Research, Education and Training and Tourism Crisis Management
15. Destination Marketing, Hospitality Management and Recent Trends in Tourism
16. Role of Technology and Multidisciplinary Approach in the Tourism Industry.
17. Archaeological Conservations, Museums & Heritage Management

Policies

Peer Review Process



1. Submission of Paper

The corresponding or submitting author submits the paper to the journal. This is usually via an online system such as Scholar-One Manuscripts. Occasionally, journals may accept submissions by email.

2. Editorial Office Assessment

The journal checks the paper's composition and arrangement against the journal's Author Guidelines to make sure it includes the required sections and stylizations.

3. Appraisal by the Editor-in-Chief (EIC)

The EIC checks that the paper is appropriate for the journal and is sufficiently original and interesting. If not, the paper may be rejected without being reviewed any further.

4. Invitation to Reviewers

The handling editor sends invitations to individuals he or she believes would be an appropriate board of review.

5. Response to Invitations

Potential reviewers consider the invitation against their expertise, conflicts of interest, and availability. They then accept or decline. If possible, when declining, they might also suggest alternative reviewers.

6. Review is Conducted

The reviewer sets time aside to read the paper several times. The first read is used to form an initial impression of the work. If major problems are found at this stage, the reviewer may feel comfortable rejecting the paper without further work. The reviewers will evaluate the paper based on the following criteria;

I. Statement of Problem or Purpose
II. Relevance of the Topic
III. Importance of the Topic
IV. Contribution to the Literature
V. The proper research methodology adopted
VI. Organization of the contents
VII. Discussion
VIII. Conclusion
IX. Quality of writing & Mechanics
X. Any other comments from the reviewers

Otherwise, they will read the paper several more times, taking notes to build a detailed point-by-point review. The review is then submitted to the journal, with a recommendation to accept or reject it – or else with a request for revision (usually flagged as either major or minor) before it is reconsidered.

7. Journal Evaluates the Reviews

The handling editor considers all the returned reviews before making an overall decision. If the reviews differ widely, the editor may invite an additional reviewer to get an extra opinion before making a decision.

8. The Decision is Communicated

The editor sends a decision email to the author including any relevant reviewer comments. Whether the comments are anonymous or not will depend on the type of peer review that the journal operates.

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If the article is ***rejected*** or sent back for either major or minor ***revision***, the handling editor should include constructive comments from the reviewers to help the author improve the article. At this point, reviewers should also be sent an email or letter letting them know the outcome of their review.

If the paper was sent back for revision, the reviewers should expect to receive a new ***version***, unless they have opted out of further participation.

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Authors should note that proofs are not supplied before publication. The manuscript will be considered to be the definitive version of the article. The author must ensure

that it is complete, grammatically correct, and without spelling or typographical errors. Before submitting, authors should check their submission completeness using the given Article Submission Checklist. The manuscript will be considered to be the definitive version of the article.

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Authors are advised to prepare their manuscripts before submission, using the following guidelines

Format	• All files should be submitted as MS Word-compatible documents. • Times New Roman font, 12-sized, and 1.5 line-spaced. Single columned layout and in B5-sized paper.
Article Length	• Articles can contain a maximum of 10 pages including references.
Article Title	• A title of not more than 20 words should be provided. • Times New Roman font, 14-sized, and 1.5 line-spaced
Author Details	• Name of each author with initials ex: Bandara, A.W.M. • Affiliation of each author, at the time research, was completed. If more than one author has contributed to the article, details of who should be contacted for correspondence. • E-mail address of the corresponding author

Abstract	• A single paragraphed abstract containing maximum of 300 words. • The abstract should include the purpose of the study, research problem, objectives, design/methodology/approach, and findings, and also could mention the originality/value of the work with the conclusion. • Times New Roman font, 12-sized, and 1.5 line-spaced. Single columned layout justified Italic.
Keywords	• Provide up to 05 keywords encapsulating the principal topics of the paper.
Article Format	• The article submission should be compiled in the following order: (I) abstract, keywords • main text including (II) introduction (including relevant literature and research objectives) (III) materials and methods (IV) results and discussion (V) conclusion and recommendations, acknowledgments (VI) references
The text	• Line spacing should be 1.5; with 12-point font Times New Roman Should employ italics • For scientific names, use the SI system/ metric system for units of measurement. • All illustrations, figures, and tables should be placed within the text at the appropriate points, rather than at the end.

References	• Please use the APA (American Psychological Association) reference style. • For detailed information, please see the Publication Manual of the American Psychological Association, Sixth Edition (2010); http://www.apastyle.org/ and http://blog.apastyle.org/ • References should be 1.5 spaced, 1.5 cm 2nd line right indent, and listed alphabetically at the end of the paper

Table of Contents

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