

Cowry Shell Money and Monsoon Trade:
The Maldives in Past Globalizations

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To the best of my knowledge the research presented in this thesis is my own except where the work of others has been acknowledged. This thesis has not previously been submitted in any form for any other degree at this or any other university.

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Abstract

This thesis addresses remote island occupation during past globalizations, through an examination of the Maldivian archaeological record. The research is underpinned by three connected research objectives: (1) establishing from where and when Maldivian colonization occurred; (2) examining how globalization is reflected in remote island use; and, (3) exploring the impacts of globalization on ethnogenesis in remote island communities. The Maldives are situated on the Chagos-Laccadives ridge beneath Sri Lanka and India in the Indian Ocean and were thought to first be occupied during a Buddhist expansion in the centuries around the BCE/CE transition. The Maldives have been the subject of limited archaeological research and have been exempt from investigations of Indian Ocean globalization and world systems despite their export of one of the earliest global commodities—cowry shell money (*Monetaria moneta*).

The research aims are addressed through the study of Buddhist archaeological sites situated in the north-central, central and southern regions of the Maldives. A detailed assessment of the recovered ceramic material culture, faunal remains and non-ceramic material culture including beads, glasses, metals and carved stones, enables an exploration of a global culture present in the Maldives during the early Buddhist occupation period and also the subsequent Islamic phase post-1153 CE.

This research presents new radiocarbon dates and a revised settlement chronology for the islands, and offers evidence for human presence in the Maldives by ~300 CE. Material culture remains support long-standing trade connections to South Asia (India and Sri Lanka). The thesis concludes that the Maldives were settled from South Asia during an expansion of Buddhism. It also suggests that globalization might be the impetus behind some remote island use and colonization in prehistory, in addition to stimulating ethnogenesis in islander societies. Thus, globalization which is often associated with cultural homogenization is better conceived as also having the capacity to generate significant cultural diversity, especially by implanting highly selected human groups into marginal environments such as remote oceanic islands.

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1

Introduction and Scope

1.1 Introduction

Discussions of early globalization typically centre on complex societies associated with continental landmasses, such as the Roman Empire or Mesopotamian Uruk, to investigate the movement of people and commodities over large areas. Consequently, there is a dearth of research into the role of islands and oceans in early globalization events, despite modern examples demonstrating that islands were strategic and important locations during globally significant expansions, like those of the Portuguese, Dutch, Spanish, English, and French empires in the second millennium CE. It is apparent that remote islands—which are defined here as those located ~250 km from continental landmasses—often have specialized geo-political and economic functions in historical globalizations. For instance, Diego Garcia in the British Indian Ocean Territory currently acts as a US Naval communications and deployment centre echoing the use of 'strategic' islands such as Malta in the past. Islands have also acted as trade entrepôts during periods of heavy interaction, as evidenced by the examples of Zanzibar, Hong Kong and Sumatra. Highly selected populations are also often present on islands during expansions, such as the historical penal colonies of Bagne de Cayenne off the coast of French Guiana and the Christian monks present on Skellig Michael, near the Iveragh Peninsula in the Atlantic Ocean (Anderson 2006). Islands can also be the subject of intensive resource extraction as with the mining of phosphate on Nauru in the Pacific and the sugar crop plantations of the Caribbean islands. It can be proposed, then, that two of the essential markers used to identify past globalizations—the development of long-distance transport systems and large-scale cultural expansions—should be especially visible in the archaeological record of remote islands and are therefore amenable to detailed historical analysis (Jennings

2011). This will enable us to better understand the impetus behind colonization and the subsequent cultural transformations to island societies. Additionally, while globalization is generally associated with cultural homogenization, the specialized function of many remote islands as a result of globalization has, paradoxically, led to the formation of human communities and lifeways that are highly distinct and which have diverged significantly from parent societies. This divergence is likely the result of cultural resistance to the centripetal tendencies of globalization and the distinctive demographic, economic, political, and societal forces experienced by insular societies occupying circumscribed environments (Goodenough 1957; Mead 1957; Vayda and Rappaport 1963; Anderson and White 1991; Irwin 1992; Anderson and O'Reagan 2000; Fitzpatrick 2004; Weisler 2004; Rainbird 2007; Fitzpatrick and Anderson 2008).

As mentioned above, few studies have attempted to investigate globalization from the archaeological record of insular landmasses. This thesis redresses this issue by examining globalization and the attendant processes in the Maldivian archipelago, a group of islands situated ~900 km from continental regions in South Asia (see Fig. 1.1 for location). The Indian Ocean has been a 'commercial nexus' for millennia and therefore provides an appropriate regional context to explore the topic (Hoogervorst 2013). Historians and archaeologists alike have established the presence of a monsoon-driven trade in connecting people from Southeast Asia, South Asia, East Asia, the Middle East, and Africa. The deeply-embedded translocal lifestyles of contemporary communities around the Indian Ocean, such as the East African Swahili, further supports the notion of an early cosmopolitanism, underlining the idea that many systems of livelihood in the region were contingent on externally traded resources. In November 2013, a conference was hosted by Oxford and the Sealinks project, *Proto-Globalization in the Indian Ocean*, which aimed to examine the degree to which the Indian Ocean represented a globalized space in the pre-1000 CE period. A review of this conference suggested that globalization needed to be better articulated by archaeologists, and that multi-site, aqua-centric approaches are the most appropriate for answering questions of globalization in the Indian Ocean archaeological record (Walz and Gupta 2012–13).

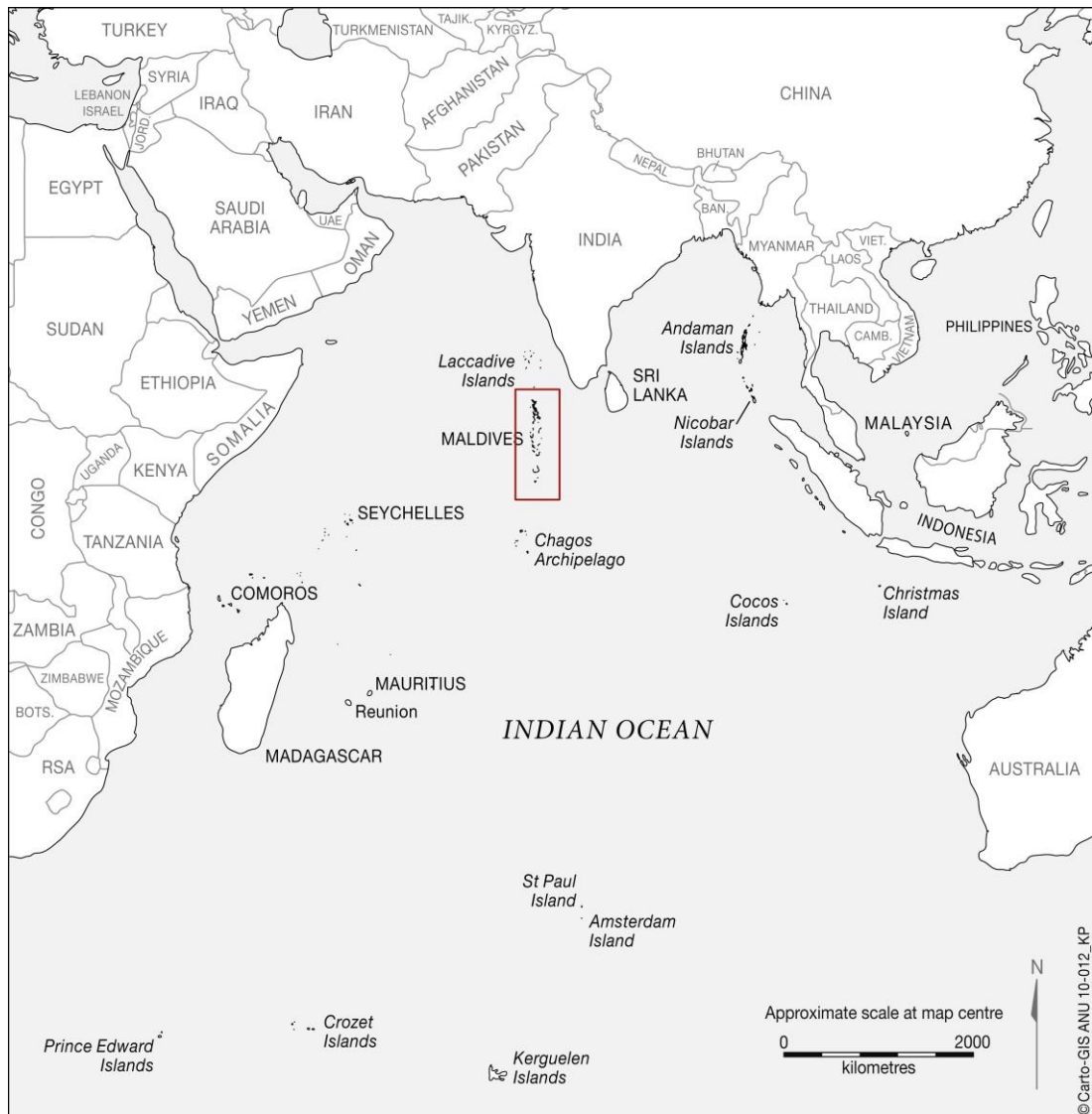


Figure 1.1 Location of the Maldives

Credit: Carto-GIS, Australian National University

On current evidence, the Maldivian archipelago was occupied during an expansion of Buddhism. Buddhism grew out of the teachings of Siddharta Guatama, who lived in the sixth century BCE in north-eastern India. It initially spread from the heartland of Nepal in the sixth century BCE, southwards into India and Sri Lanka and northwards into the higher latitude regions of China (Barnes 1995), incorporating an oceanic expansion that reached the Maldives, likely coincident with the initial colonization of the archipelago. Thus the timing of human arrival in the Maldives, and the source of the founding population can be used as a baseline to examine globalization and the reason for remote colony emplacement. Secondly, the transformations experienced by Maldivian society over almost two millennia illustrate the tensions between the

emergence of local and global forces on an island society that specialized in the production of a preciousness—cowry shell money—that was widely exported and used as currency, likely from the first millennium BCE to ~1850 CE. A momentous event was the arrival of Islam in the archipelago in 1153 CE, which rapidly supplanted Buddhism and integrated the Maldives into the powerful and extensive Islamic world. As Islam also dispersed through other parts of the Indian Ocean, it is probable that pre-existing Maldivian trade links with South Asia, were the conduit through which Islamic influence expanded into the archipelago. This example highlights the role that these islands had as specialized regions in globalization and expansions, with cowry shell extraction a component of both Buddhist and Islamic occupation phases.

This thesis agrees with Mikkelsen's (2000) proposition that it was the presence of *Monetaria moneta* (money cowry), in conjunction with the fortuitous monsoon conditions, which provided the impetus for human settlement of a remote island group by a global culture (Buddhism). It will also argue that on current evidence these islands were some of the first to be settled in the Indian Ocean. These results impact our knowledge of Indian Ocean prehistory and also of remote island use in general, in that the occupation history is distinct from the Pacific, where globalization was not a widespread feature during initial colonization and is associated with the expansion of European powers in the second millennium CE.

1.2 An Early Global Commodity: Cowry Shell Money

Shells of molluscs have long been utilized as a medium of exchange in many contexts, but none more widely than the cowry shell. Cowry shell money mainly refers to the species *Monetaria moneta* (money cowry), but also to *Monetaria annulus* (ring cowry, see Fig 1.2). The Maldives became the major exporter of money cowry until the collapse of the industry in the nineteenth century.

Monetaria moneta is one of ~200 species of gastropod from the family Cypraeidae (collectively also referred to as 'cowry'). These molluscs inhabit tropical and subtropical intertidal areas, mainly on coral-reefs, and are abundant across their distribution range throughout the entire tropical Indian and Pacific Oceans (see Fig. 1.2). Cowry are largely carnivorous and feed on sponges, except for the herbivorous

grazers *Monetaria moneta* and *Monetaria annulus*, which feed on algae. They can grow to a length of 44 mm, although typically only reach 20 mm. The shell of *Monetaria moneta* is heavily margined, with a yellowish-green dorsum (see Fig. 1.2).

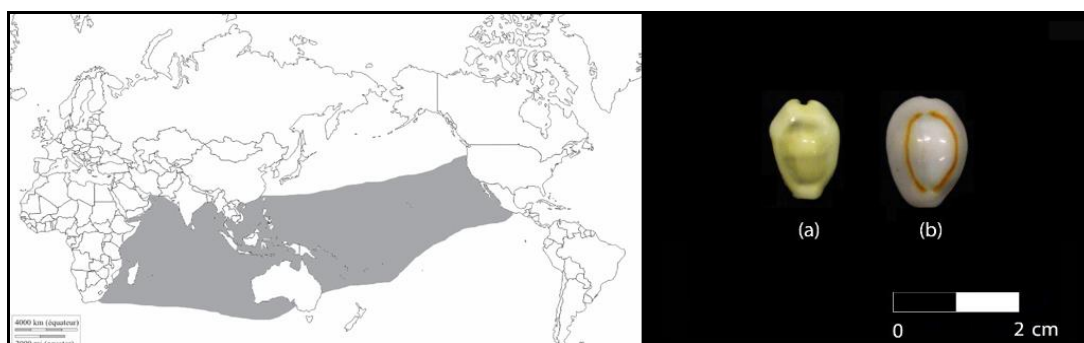


Figure 1.2 Habitat of *Monetaria moneta* (shaded);
(a) *Monetaria moneta* (Linnaeus, 1758); and,
(b) *Monetaria annulus* (Linnaeus, 1758).
Credit: Mirani Litster

The cultural use of cowry has considerable time-depth, and the molluscs were generally not consumed, with many references to the meat having a ‘bad taste’. The earliest records of the shells serving a cultural function have been associated with Upper Palaeolithic sites in France, Italy and Slovakia, with early suggestions that the symbolic importance was associated with its likeness to a female vulva, a half-closed human eye or to a serpent’s head (Kovács 2008). The shells have been found in pre-Dynastic contexts in Egypt, with finds from Central Asia dating to ~6000–7000 BCE and cowries in Chinese contexts dating to the Neolithic from 3300 BCE onwards (Peng and Zhu 1995). Money cowry has also been used in India, Mainland Southeast Asia (MSEA) and Africa. Cowries were used in Europe for both decorative and ritual purposes, potentially becoming incorporated into early amber exchange networks (Hogendorn and Johnson 1986; Mikkelsen 2000) and they have also been used in the Pacific for both ornamentation and as tools (Kirch 1997; Szabó 2004). However, the most conspicuous use was as a widely dispersed currency. The shell readily lends itself to this purpose, for it is physically robust, retains a high lustre for several centuries of circulation and it is also difficult to counterfeit (Chaudhuri 1985; Hogendorn and Johnson 1986; Kovács 2008).

1.2.1 Extraction in the Maldives

Whilst *Monetaria moneta* is found in a variety of locations (there are six major biogeographical regions or ‘cowry provinces’ where wide ranges of species from the family exist) (Moretzsohn 2014), there were several advantages to it being processed in the Maldives. *Monetaria moneta* was abundant and the species could be collected from high-density aggregations in the atolls, unlike East Africa, where it was relatively scarce and the Seychelles, where it was associated with *Monetaria annulus*, which had to be removed by labour intensive sorting. Furthermore, in the major West African markets *Monetaria moneta* were known as ‘small Maldives’. The value of cowry money is contained in the shell unit; hence, smaller shells were more readily sought, as larger quantities were able to be carried and exchanged (Hogendorn and Johnson 1986).

Most information about the extraction and export of money cowry in the Maldives is from historical records. The oldest dates to 851 CE and was composed by the Persian merchant Sulamain who highlighted that ‘the wealth of the people is constituted by cowries; their Queen amasses large quantities of these cowries in the royal depots’ (Renandot 1718). Sulamain described the processing of cowry, which included the collection of the gastropods that had aggregated on coconut fronds placed in reef shallows. The *Monetaria moneta* were then left to dry and the flesh to desiccate. Another mechanism by which the shells were processed involved their burial in sand, a method which was corroborated by Al Masudi’s tenth century account. Arab traders would buy cowries very cheaply from the Maldives, and resell them at a much inflated price in Africa. Soon French and English traders became involved in the lucrative business, exchanging cowry shell for slaves, which were then resold. Pyrard de Laval wrote in the seventeenth century:

They called them (cowries) ‘Boly’ and export to all parts an infinite quantity, in such wise that in one year I have seen 30 or 40 whole ships loaded with them without other cargo. All go to Bengal for only is there a demand for a large quantity at high prices. The people of Bengal use them for ordinary money although they have gold and silver and plenty of other metals; and what is more strange kings and great lords have houses built expressly to store these shells and treat them as part of their treasure. (de Laval 1619:251)



Figure 1.3 A summary of the use of cowry shell money (*Monetaria moneta*) in different contexts
 Credit: Mirani Litster

However, by the nineteenth century the trade in cowry was threatened by inflation and eventually destabilized (Hogendorn and Johnson 1986). The Maldivian Sultanate also introduced the Borah into Male', who were Gujerati Muslim merchants concerned with establishing warehouses and shops. Borah monopoly over foreign trade was achieved by 1887, before their ousting from the Maldives in 1950. By this stage the Maldives began to rely on other exports to sustain the local economy, which was subsequently replaced by the marine resource industry and the later introduction of tourism in the twentieth century (Chaudhuri 1985; Hogendorn and Johnson 1986; Maloney 2013).

Despite, the significant export cowry and its use as a currency from China through to Africa, little archaeological research has been conducted in the Maldives to better elucidate the timing and nature of the processing of cowry shell and its export. Did humans colonize the Maldives and only later start to exploit the cowry, or as Mikkelsen (2000) has suggested, was colonization intended to exploit the wealth of cowry from the very start? The difference is crucial for understanding remote island use and the impact of globalization on isolated environments. Mikkelsen (2000) reported direct dates on cowry shells deposited in large caches at the Kuruhinna Tharaagadu monastery ~50 BCE (radiocarbon chronologies are discussed in Chapter Five) suggesting that cowry shells were exploited near the start of the Maldives sequence.

1.2.2 China

In China, the cowry symbolized power, prestige and wealth, which is exemplified by the large quantities of *Monetaria moneta* found in Shang dynasty (mid-second millennium BCE) tombs in the Yellow River region and its association with precious items such as bronze and jade (Yang 2011). The earliest evidence for the shells being used as money comes from this region, which is further supported by the adoption of a bronze skeuomorph (*tongbei*). These cowry copies acted as one of the earliest forms of metal money in Chinese history and date to the Shang period (Yang 2011). The source of early cowry shells in China has been speculated to be the South China Sea, although Yang (2011) disputes this suggesting that an Indian Ocean source is more likely. This, is more likely, as the earliest recorded dates of human presence in the

Maldives are considerably later than the second millennium BCE. Furthermore, the early Chinese dates for cowry predate the earliest possible occupation of the Maldivian archipelago (Kench *et al.* 2009), and therefore a South China Sea or other source for early *Monetaria moneta* in China is likely, with Maldivian shells probably becoming incorporated in an intermediate period of their exchange.

1.2.3 India

The use of cowry shell money in India is well documented. The shells were exchanged for rice and cloth from Maldivian traders, with early historical records dating to the fifth century CE. Not all cowries were resold but remained in India. Whilst Kovács (2008) suggests that they were used only in Southern India, where they occupied the lowest ‘niche’ of currency, Deyell (1999) reports that large cowry hoards have been recovered in Northern India. Heimann (1980) highlights that India was subdivided into local market economies based on cowry exchange and transmarket economies based on metal currencies. Cowry shell in India formed part of the state tax system and also acted as a form of donation to monasteries, where the shells would form part of a ritual function or as a component of a hoard (Yang 2011).

1.2.4 Mainland Southeast Asia

Owing to the long-standing connection between India and Southeast Asia, Thailand began to similarly use cowry shell as a form of money, utilizing the shells as small money and for religious dedications (Yang 2011). The introduction of shell money occurred later than in India and in China, and it appears that the cowry was sourced from multiple regions—either from Borneo or the Maldives. Tomés Pires, the first Portuguese ambassador to China remarked on cowries in Thailand during the fifteenth century:

‘Cowries come from the Maldives (Diva), where they make large quantities of towels, and they also come from the islands of Bangaga and of Borneo (Burney) and they bring them from Malacca and from there they go to Pegu...cowries, like those current in Pegu, are current throughout the country of small money, and gold and silver for the larger coins.’ (Cortese 1944:100)

Cowry shell money was surprisingly not used in the adjacent regions of Cambodia or Vietnam or in Island Southeast Asia (ISEA), despite its use in Thailand.

1.2.5 West and East Africa

Radiocarbon dates from West and East African archaeological contexts (excluding Egypt) confirm the presence of *Monetaria moneta* at sites during the second millennium CE. Monod (1969) recovered the remains of a caravan from a twelfth century site in Ma'din Ijafin, in current day northern Mauritania. This discovery included several baskets of cowry shell, numbering in the thousands, and 2,000 copper and brass rods, likely intentionally buried to protect it from theft. Cowry has been recovered minimally from African sites in slightly earlier contexts, such as those from Esouk (c. 950–1200CE) (Nixon 2008). These shells were not sourced from West Africa and would have probably been imported from the Maldives. Cowry shell deposits in early African archaeological contexts were mainly *Monetaria annulus*, suggesting an import of Maldivian cowry into West Africa subsequent to a period when the locally sourced ring cowries dominated.

When Europeans entered West Africa, they began to participate by combining the cowry trade with the Atlantic slave trade. The Portuguese initiated use of the cowries as ballast by stocking up on the shells in Sri Lanka and India. In 1680 European slave traders exchanged 10,000 shells for one slave; however, by the 1770s, 150,000 cowries could be exchanged for one slave (Scales 2015). The Dutch controlled the industry until the 1750s and the British controlled the trade until 1807. The ‘small articles functioned as a lubricant for the European colonial machine’ (Yang 2011:20).

The faltering of the industry relates to the introduction of a competing version that resulted in the collapse. In the case of *Monetaria moneta*, this was the golden ringer or ring cowry—*Monetaria annulus* (see Fig 1.1). In 1845, a German trader was denied the purchase of cowries from the Maldivian king, causing him to seek the shells from Zanzibar. It was here he noted an abundance of *Monetaria annulus*, which he harvested extensively from the East African coast and imported into West Africa. This stand-in was welcomed as a cheaper alternative to the Maldivian money cowry, resulting in hyperinflation and the collapse of the industry, with some shells crushed into limestone and others buried as hoards (Scales 2015). An estimated 30 billion Maldivian cowry shells were fed into international markets before the collapse of the industry.

1.3 Previous Perspectives and Frameworks: The Indian Ocean and Early Globalization

Early Indian Ocean studies were concerned mainly with numismatics, which involved the cataloguing and recording of Roman and Chinese coins recovered in India during the British colonial period. Toponymy also informed archaeological discussions in the nineteenth century, with Western travellers connecting place names to those in classical studies (Seland 2014). However, these numismatic and toponymic studies were soon overturned and it was ‘the sunset of [this] colonial archaeology [which]...became the wellspring of the archaeology of Indian Ocean trade’ (Ray 2003). The first major excavation was of the port site of Arikamedu, located in contemporary Pondicherry, directed by Wheeler in 1945 and attached to the Archaeological Survey of India (ASI). Arikamedu was subsequently excavated in 1989 and 1990 by Begley (Begley *et al.* 1996). Seland (2014) remarked that the excavations of Arikamedu became the ‘blueprint’ for archaeological research throughout the Indian Ocean. The next major port site to be excavated was the Omani site of Khor Rori (Sumhuram) in contemporary Dhofar, which was excavated by Wendell Phillips and the American Foundation for the Study of Man in 1952 and later again in 1996 as part of an Italian investigation (Office of the Advisor to His Majesty the Sultan for Cultural Affairs 2008). During the excavations at Arikamedu and Khor Rori, numerous material culture correlates suggesting links to other parts of the Indian Ocean were recovered, and the archaeology of Indian Ocean trade became a nascent discipline. In the post-colonial era, Indian Ocean archaeological research tended to focus on national sub-disciplines (Seland 2014:4). Hence, it adhered largely to particularistic micro-regional approaches, otherwise known as ‘culture-history’. This situation resulted in limited engagement with alternative frameworks to explain interactions at a translocal scale.

Early historical research coincided with the first excavations of major port sites. In the 1950s the pioneering research of Villiers (1952) promoted a history focussed on the remote islands in the region—the Mascarenes, the Seychelles, and Chagos. However, until recently the Indian Ocean has remained relatively understudied compared to the Atlantic and Pacific (Vink 2007). It was when attempts to deal with the conceptual challenges presented by the historical study of the Indian Ocean, involving an apparent

‘hundred frontiers’ and a ‘globalized, interregional ... seascape’, that a theoretical framework known as the *New Thalassology* was developed in the 1980s (Vink 2007). The new school represented a hybridization of both Braudelian *Annales* based research and world systems theory (WST), emphasizing the need to study process and to recognize unity in the Indian Ocean region (Wallerstein 1974; Vink 2007); consequently, Indian Ocean historians developed an appreciation of both long-term histories (*la longue durée*) and the cosmopolitanism of the space. The *New Thalassology* was also characterized by a search for ‘meaningful units of analysis’, such as ‘parallel Mediterraneans’ (Vink 2007:43).

Vink (2007) lists three major proponents of the school, including Chaudhuri (1993), Pearson (2003) and McPherson (2003). The first author borrowed from Braudel’s (1949) seminal Mediterranean research by accentuating a regional unity ‘cutting across geographical and cultural watersheds’, which was considered a consequence of the capitalist, long-distance trade in luxury goods and bulk commodities (Chaudhuri 1993). Chaudhuri also discussed flexible scales of analysis, suggesting that the Indian Ocean should be treated as a single unit; however, this was neither always beneficial nor relevant in other cases (Vink 2007:44). The discussion also highlighted four major ‘expansionary forces’ which included the rise of Islam in the seventh century CE, the Chinese presence and political power, and the periodic migration of Central Asian nomadic people in the first millennium CE, and the more recent European maritime expansion (Vink 2007). Michael Pearson also adopted a similar Braudelian perspective, by presenting similarities and *la longue durée*. He argued that the physical factors, or the invariant ‘deep structure’ elements, provided cohesion in the region (Pearson 2003). He discussed further common cultural factors including, ‘port-cities, shops and seafarers, long-distance trade in both luxuries and bulk commodities, religious activities among some communities; the dissemination of the *lingua franca*; and, in the early modern period, the politico-military presence of the Portuguese and their string of coastal forts’ (Pearson 2003:3-5). McPherson (1993:15) argued that cultural practices were often connected by trade that shared ‘certain cultural commonalities which set them apart from the peoples of the contiguous worlds’.

Conversely, as Vink (2007) highlights, the *New Thalassology* has been criticized for an apparent ‘false concept of unity’ (Chaunu and Bertram 1979). For example, Horden and Purcell (2000) considered that the region was negotiated through the individual movements of agents, concerned with their associated political states. Outside of these major works, many historical studies exist which further debate this argument in addition to presenting large syntheses of the area, including those by Borsa (1990), Bose (2006), Chandra (1987), Chaudhuri (1985), Dasgupta (1982) and Mukherjee and Subramanian (1998).

Larger archaeological research programmes have been recently developed to mirror the larger historical studies, which examine the entire region and elucidate the processes associated with pervasive interaction in the region. Many discussions have borrowed from both disciplines, with archaeologists referring to the *New Thalassology* and also WST (e.g. Pearson 2003; Ray 2003; Beaujard 2005; Fuller *et al.* 2011; Boivin *et al.* 2013; Hoogervorst 2013; Walz and Gupta 2012–2013; Seland 2014). This thesis research introduces an alternative frame of analysis—Jennings’ (2011) model of a global culture, which enables an exploration of the cultural dimensions of globalization previously unrecognized in the *New Thalassology* and WST models, whilst also addressing the possibility for the existence of multiple past periods of globalization.

1.4 Research Aims

This thesis is structured around three broad research aims that are central to understanding the human history of the Maldives and the role of islands in globalizations:

- 1) *When did Maldivian colonization occur and from where?*

This aim is fundamental to the historical study of remote islands and was examined from the analysis of archaeological materials from four excavated sites: Kuruhinna Tharaagadu, Nilandhoo Foamathi, Bodu Havitha and Dhadimagi Havitha, and a surface scatter on Vadhoo Island. New radiocarbon dates and a revised settlement chronology for Kuruhinna Tharaagadu and Nilandhoo Foamathi provide solid evidence of human occupation in the

Maldives by ~300 CE. Material culture remains and architectural similarities also support a South Asian origin and long-standing trade connections with South India.

2) *How does remote island settlement reflect globalization?*

The motivation for prehistoric migrations is difficult to discern and is especially perplexing in the case of remote island colonization as these landmasses are often resource poor and vulnerable environments for human occupation. The Maldives are low-lying carbonate islands with scarce terrestrial sources, including limited arable land and access to freshwater. This thesis argues that the Maldives were settled relatively early and participated in Indian Ocean maritime networks, largely through their contribution of cowry shell money. This hypothesis provides insight as to why several other remote island groups such as the Seychelles, Chagos, Christmas Island and Cocos-Keeling were left uninhabited until the later European maritime expansions. The pattern of human settlement in the Indian Ocean is very different from the Pacific where almost all remote islands were settled by 3000–700 cal. BP, and this thesis contends that different processes are responsible for these patterns—migration in the Pacific and globalization in the Indian Ocean.

3) *How does globalization contribute to ethnogenesis in remote islands?*

The third question relates to ethnogenesis in remote islands during globalizations. The Maldives experienced the introduction of two global cultures—the expansion of Buddhism and then of Islam—yet the island culture remained distinctly Maldivian. A larger debate exists concerning the reticulate (horizontal) and phylogenetic (vertical) transmission of culture, and whether cultural, linguistic and biological diversity stems predominately from an ancestral package in different environments (phylogenetic transmission) or if it develops through long-term dynamic interaction among communities over large areas (reticulate transmission). The colonization of islands during past globalizations has seen the implanting of select populations of people, which includes people of particular social and religious positions and beliefs (Anderson 2006). The founding population and culture of the Maldives, here

argued to have been Buddhists of South Asian ancestry, was challenged by the arrival of Islam in 1153 CE, which caused rapid cultural turnover. The Maldivian example illustrates that ethnogenesis in a globalized environment can result in extremely rapid and profound transformations to islander society, and neither phylogenetic nor reticulate models fully account for the scale and speed of cultural change. Over the course of two millennia a distinct Maldivian culture emerged, illustrating that globalizations have shaped human cultural diversity.

1.5 Research Background and Methodology

This thesis developed out of a larger Australian Research Council (ARC) Discovery Grant (DP0986991) ‘Crossing the Green Sea: maritime mobility, trans-oceanic interaction and remote island colonization in the tropical Indian Ocean’. The ARC project aimed to examine Madagascar, the Seychelles, Chagos and the Maldives (the ‘Green Sea’ voyaging corridor), for evidence of prehistoric human presence and the ‘timing, nature and origins of trans-oceanic movement’, through archaeological and palaeoenvironmental investigations (Anderson *et al.* 2009). This ARC Discovery was also a partner of the Sealinks project based at the University of Oxford, which aimed to examine early Indian Ocean maritime connections and globalization, through multi-disciplinary collaborations.

In order to address the research aims outlined in Section 1.4, previously excavated materials from Maldivian archaeological sites were analyzed. These collections were housed at two Norwegian institutions—the Kon-Tiki Museum and the University of Oslo—and contained material from four excavated sites. These sites were excavated during the 1980s and the 1990s (see Chapter Five for more detail concerning the excavations and sites). Preliminary analysis of these collections had been previously undertaken in the 1980s and 1990s, which included counts of each cultural material class type (i.e. bone and ceramics); however, no detailed or comparative analyses had been undertaken on the material.

The analysis presented in this thesis was conducted by the author (Mirani Litster), unless otherwise indicated (i.e. specialist analyses, such as aDNA and radiocarbon). The new analysis presented here contributes significantly to our understanding of the

early occupation period of the Maldives, which also benefits from the application of new analytical techniques, as over twenty years have elapsed since their initial excavation.

1.6 Thesis Structure

The thesis is composed of ten separate chapters. *Chapter Two* establishes the theoretical framework, defines globalization and presents a discussion of globalization theory and its application to archaeology. The chapter closes with an outline of the model used in this research.

Chapter Three presents the Indian Ocean context by establishing the physical parameters that limit interaction in the region, including invariant elements such as wind, topography, currents, tides and waves. This outline is followed by a review of the archaeological evidence for interaction, from early maritime initiatives through to the more recent occupation of the Mascarenes in the remote Western Indian Ocean.

Chapter Four outlines the research setting—the Maldives. This chapter reviews the physical setting, the cultural context and closes with an overview of the archaeological and historical background.

Chapter Five presents the sites discussed in this research. It overviews the excavation methods, major structural features, non-structural material culture finds and dates. These sections are followed by a discussion which outlines site occupation and formation.

Chapters Six, Seven and Eight present the analytical methodology and results for each material culture class returned from Maldivian investigations. Chapter Six outlines the analytical methodology and results for the ceramics. Chapter Seven presents the methods and results for the excavated faunal remains and Chapter Eight describes the analytical methodology and results for the non-ceramic materials recovered from the Maldivian investigations.

Chapter Nine discusses these results within the globalization framework presented in Chapter Two and *Chapter Ten* concludes the thesis by readdressing the initial research aims outlined in this chapter.

2

Past Globalizations: Defining Concepts and Theories

2.1 Introduction

As the previous chapter outlined, archaeologists have increasingly focused on conceptualizing the Indian Ocean as a place of early globalization. The topic of incipient globalization has been broached predominately through proxy evidence provided by human-mediated crop transfers and other biological translocations (Fuller *et al.* 2011; Boivin *et al.* 2014). For the first millennium BCE and first millennium CE, material-culture connections have been examined in the region, with suggestions that the wide-ranging presence of certain artefact types outside of their production locale, is associated with a degree of intensified and complex interaction (i.e. the distribution of Indo-Pacific beads, Sasanian-Islamic glazed ware, Indian rouletted ware and the later dispersal of Chinese porcelain). However, despite the archaeological discipline's acceptance of the region as an arena of intense interregional interaction, these connections have been ill-defined outside of the application of world systems theory (Beaujard 2005, 2007, 2011, 2012) and a discussion of global capitalism (Croucher 2015). What is left wanting from these previous models, is both a detailed exploration of the cultural dimensions of globalization, and also a mechanism which enables the examination of plural globalizations in the past, so that comparable trends across multiple temporal contexts might be explored. As such, the use of a global cultures framework, as conceptualized by Justin Jennings (2011) has been adopted.

This chapter begins by examining previous definitions of globalization and establishing a useable definition for use in this thesis. A review of major globalization theories follows, including: world systems theory, global capitalism, the network society, transnationality and transnationalism and cultural theories of globalization.

This review is followed by a discussion of how globalization can be isolated and examined in the past. The chapter closes by identifying an appropriate model for application to the archaeological record for use in the Maldivian context in Chapter Nine.

2.2 Defining Globalization

The term ‘globalization’ connotes the present and is typically depicted as synonymous with western cultural imperialism. It is often associated with both negative and positive social impacts—mainly the destruction of local identity (Tomlinson 1999). However, how the process is defined relates much to the theoretical or disciplinary perspective adopted, or as Nederveen Pieterse (2004:46) comments ‘in the social sciences there are as many conceptualizations of globalization as there are disciplines’.

Early specifications of globalization outlined that it is something which extends over a long distance, and this has often been the case in Indian Ocean studies, where the wide-spread dispersal of particular material culture objects, such as Roman coins or Chinese celadon, have often been considered representative of the phenomenon. However, these interpretations preclude a focus on the process of globalization in the definition, which has been rectified in more recent specifications. Robinson (2008) suggested that it constitutes ‘intensified interconnections and interdependencies on a planetary scale and consciousness of them’ and Tomlinson (1999:2) defined globalization as a state of ‘complex connectivity’. These recent versions appropriately advance our understanding of globalization in that they shift the focus from space to process, addressing the range of triggers which can alter the social, political and economic composition of the recipient context. This emphasis on process is incorporated into this thesis research.

Robinson (2008) has also identified major domain questions which feature across different theoretical perspectives and those relevant to the research aims of this thesis include:

- When does globalization begin?
- What are the causal determination(s) in globalization?
- What is the relationship between globalization and the State?

Multiple approaches to the first question exist; with some scholars arguing for a 5,000–10,000-year time frame, which correlates to the ‘long-term’ approach adopted in this research and is further outlined in the forthcoming section on ‘Past Globalizations and Archaeology’. Other approaches have a smaller 500-year context which is coterminous with the expansion of capitalism and modernity. The final considers globalization as much more recent and suggests that it occurs in the 30–40 years post industrialization (see Fig. 2.1).

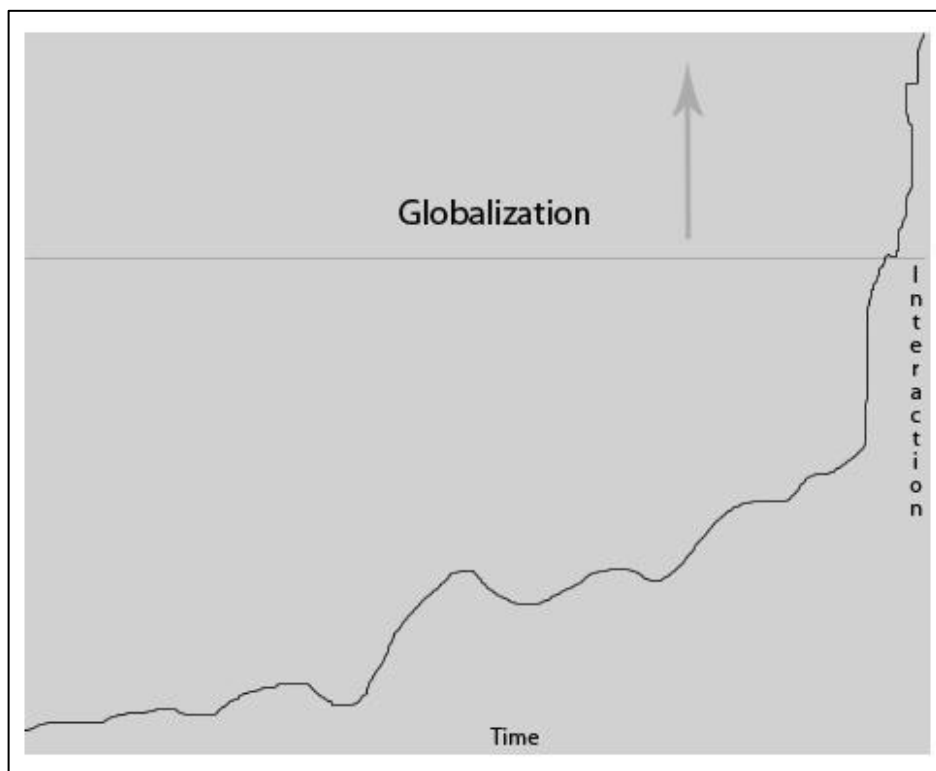


Figure 2.1 Globalization as a modern phenomenon

Credit: Adapted from Jennings (2011:9)

This domain question is outlined in further detail in Table 2.1. The second major domain topic with which this thesis is concerned, is associated with the major cause/s of globalization episodes. Robinson (2008) outlines that there may be multiple determinations and that different theoretical perspectives will emphasize distinct causative factors. This thesis highlights a case for multiple causes in the Indian Ocean, including economic, political and cultural reasons but also suggests environmental factors were present which were supportive or inhibitive of globalization processes. Finally, this thesis also examines the relationship between globalization and individual

territories, by investigating the manner in which the relationship between social structure and territoriality is redefined by the phenomenon.

2.3 Theories of Globalization

Globalization studies are transdisciplinary and include approaches founded in cultural studies, international relations and post-colonial studies and consequently they fall under several larger theoretical paradigms i.e. functionalism and postmodernism (Robinson 2008). Globalization research emerged as a subfield from the 1970s onwards and it involved the study of a globalized economy with new and particular systems of production, finance and consumption (Robinson 2008). Other particularities came to be studied including transnational and global patterns. International institutions such as the International Criminal Court (ICC) and the United Nations (UN) were also discussed, feeding into discussions concerning global political processes. Migration and the international movement of people were also studied, in addition to the shifting power relations developed during the globalization process (Appelbaum and Robinson 2005). This sub-section outlines and evaluates major globalization theories that emerged from these studies including: world systems theory, theories of global capitalism, network theory, transnationality and transnationalism and cultural theories, and how and if they have been applied to Indian Ocean research.

2.3.1 World Systems Theory

World systems theory has been the most extensively used 'globalization' theory in Indian Ocean studies (e.g. Beaujard 2005, 2007, 2011, 2012). WST was initially conceptualized as a reaction to functionalist theories in the social sciences by sociologist and historical social scientist Immanuel Wallerstein (1974) to better understand capitalist economies within larger systems (Shannon 1996). Wallerstein developed the theory out of the prior work of dependency theorists (Amin 1975) and was also influenced by the *Annalists*, including the aforementioned work of Braudel (1949). The theory underlines that the development of one society is contingent on economic processes, commodity exchanges, labour division and geo-political relationships that operate at a larger scale (Klak 2004:121). WST challenged previous notions that the unit of analysis should not just be a state/society—rather it should be the larger integrated system (Robinson 2008:128). It has been broadly defined as that

‘which examines ‘macro scale culture-historical phenomena that, in essence have three denominators’ (Robinson 2008:128). These factors include a rejection of socio-historical groups being self-contained units, an emphasis on establishing the relationship between such groups in spatio-temporal examinations and an understanding of the systemic processes that illuminate the ‘nature of these relationships’ (Peregrine 1996).

Some researchers view WST as preceding globalization studies; however, Wallerstein conceived of globalization within the original theory as something which could be equated to the spread of world capitalism at approximately 1500 CE. Wallerstein’s (1993) temporal boundary of the recent five centuries has been ignored by archaeologists and historians who have engaged the model to apply to the longer-term record (Hall *et al.* 2011). Proponents of the archaeological approach implore that the accumulation of capital as abstract wealth is both a contemporary and ancient phenomenon and generally reject the idea of *Homo economicus* (Ekholm and Friedman 1982).

One of the central themes of WST is the differentiation between core-periphery power relations. The world system is divided into three areas—cores and peripheries, with a semi-periphery existing between the two (Stein 2002). The core is economically and politically developed, with centralized authorities directly supporting exchange relationships within the world system, in addition to facilitating accumulation and investment of surplus. The cores have diversified economies which specialize in the production of complex products of high-value for use both in the core and the periphery. Staple goods have also been more recently incorporated into world systems models as exports emanating from the core (Blanton and Feinman 1984). The core ‘creates’ the periphery through this exchange relationship, thereby pulling it into its control (Stein 2002:224). The periphery is often considered ‘less-developed’ than the core and exists spatially at the edges of a particular world system. It is usually considered to be controlled either by colonial administration or by weaker local rulers who depend on the core-exchange relationship. Peripheries tend to focus on monoculture and the provision of raw materials to the core (Stein 2002). The role of the periphery in the world system becomes limited to the export of raw materials to the core, thus further engendering the dependency relationship and the core’s control

over the exchange system, including their role in manufacturing finished products. This relationship eventuates in power of local elites on the periphery, which can result in complex societies existing in underdeveloped peripheral areas (Stein 2002:224). The semi-periphery exists geographically and organizationally between the two extremities of the world system—the core and the periphery. The political system is often less complex than that of the core, but is more centralized and hierarchical than typical peripheral polities. Stein (2002) further suggests that the semi-periphery also falls between the core and periphery in terms of labour control, and it acts as a buffer zone between the two poles—thereby stabilizing the whole system (Stein 2002:224).

Hall *et al.* (2011) and Wallerstein (2004) have defined the boundaries of a world system as ‘a spatial/temporal zone which cuts across many political and cultural units, one that represents an integrated zone of activity and institutions which obey certain systemic rules’ (Wallerstein 2004:17). The ‘external area’ exists beyond the boundaries of the world system under study (Stein 2002). This external area could also consist over other world systems, for example Stein (2002:224) cites two contemporaneous world systems operating in the first millennium CE—Han China and the Roman Empire.

Since the initial formulation of world systems theory by Wallerstein in 1974, several refinements and elaborations have resulted in the refined comparative world systems analysis (Hall *et al.* 2011:237). World systems analysis (CWSA) introduces comparative analyses into the discussion of such models, involving empirical questions to ‘transform assumptions in early formulations’ and it has been described as a ‘general approach that encompasses several competing theories, all of which emphasize interaction as central to cultural and social change’ (Denemark *et al.* 2002). Hall *et al.* (2011) defend Wallerstein’s original approach as being an initial phase of theory construction and suggest contemporary criticisms of WST typically ignore 40 years of development. They argue that it should be considered a ‘perspective’ and not a ‘theory’, and it exists as a ‘collection of approaches that share key aspects of the early versions’. Hall *et al.* (2011:239–240) more generally suggest that world systems ‘are forms of human organization that are larger than societies or states, and there is a dialectic between the World System and its constituent parts ... [e]ach shaped the other’.

2.3.2 *Theories of Global Capitalism*

Capitalism concerns private ownership over the means of production and global capitalism refers to this on a larger scale. As such, the school of global capitalism, much like WST, is a macro social theory; however, it positions globalization as a ‘novel stage in the evolving system of world capitalism ... [or] global capitalism’ (Robinson 2008:130). Essentially, globalization was responsible for the propagation of global capitalism. Major proponents of the theory include Robinson (2008) and Sklair (2002). Hardt and Negri (2000) adopt a postmodern take on the phenomenon. As highlighted by Robinson (2008:131), other variations of the theory have also been discussed by McMichael (2000), Ross and Trachte (1990) and Went (2002).

Global capitalism is thought to succeed previous national forms of capitalism, and is also considered to be composed of new transnational systems of production and finance which were not present in the prior form. In theories of global capitalism, globalization is responsible for integrating ‘national circuits’ into new global circuits of production and accumulation. Sklair’s (2002) ‘theory of a global system’ present the transnational practices (TNPs) as operational categories which are founded by non-state actors outside of conventional geopolitical boundaries. Three levels of TNPs exist in the ‘global-system’ model, including the transnational capital (economic), the transnational capitalist class (TCC) (political) and the cultural elites (cultural ideological). Robinson (2008) also developed a model which involved three transnational facets, including production, capitalists and a state. Sklair and Robinson differ in their approaches to the political component of the theory (TCC) in that Robinson (2008) adopts a national-global duality approach, by suggesting that the transnational state (TNS) is loosely comprised of ‘supernational political and economic institutions’ together with national counterparts which have been ‘penetrated and transformed’ by transnational forces. However, Sklair’s (2002) configuration suggests no role of the TNS in the formation of the new global system.

Whilst trade has existed throughout most of the human history of the Indian Ocean, by no means was it consistently apparent as a form of capitalism. Global capitalism and capitalism more generally require the technological means able to produce on an industrial scale, which didn't occur extensively until the modern era. As such, the direct relevance to Indian Ocean archaeology is temporally narrow, with applications

currently only seen in studies of nineteenth-century clove plantations on Zanzibar (Croucher 2015). These models conceptualize globalization as a stepping stone in the emergence of a defined period of global capitalism.

2.3.3 *The Network Society*

Castells' concept of the network society is defined by an emphasis on technology: 'Technology does not determine society: it *is* society' (Castells 2005:3). Castells' theory suggests that globalization occurred during the 'Age of Information', or the more recent information technology era. This 'technologicistic' approach is presented in *Rise of the Network Society* (1996), where technology is considered the instigator for globalization. Technology is also a requisite for the emergence of new modes of social organization founded on networking (Castells 2005). Castells suggests that this involves a novel global economy with altered modes of development that is knowledge based, global and networked. He considers that 'the networked enterprise makes material the culture of the informational, global economy: it transforms signals into commodities by processing knowledge' (1996:188). Network society proponents are more positive about the tangible implications of globalization than WST and global capitalism theorists (Robinson 2008); however, similarities with WST are evident. These similarities being the core-periphery relationships that are established based on access to technology i.e. those 'switched on to the new technological system and those switched off or marginalized, giving rise to the oft-cited digital divide' (Robinson 2008:133).

Despite Castells' initial assertions that the concept of the Network Society is a modern phenomenon, like many proponents of WST, it has been presented as a framework for use in understanding prior interactions (LaBianca and Scham 2006). Castells' approach was examined in *Connectivity in Antiquity* (2006), whereby it was raised that network connections were important in earlier periods: 'Those of us who work [in archaeology] can hasten to assure Castells that, while his theoretical framework is wholly innovative, the trends he explicates are quite typical of cultures and societies from previous millennia' (LaBianca and Scham 2006:2). This framework has yet to be adopted in Indian Ocean archaeology, however its relevance is apparent in terms of the region being a 'nexus' or a system of trade network.

2.3.4 *Transnationality and Transnationalism*

When dealing with globalization, immigration studies have focused on theories of transnationality and transnationalism; however, they also appear in dialogues associated with ethnic group formation. Transnationalism is the condition of increased interaction across geopolitical boundaries. Transnationality as a term is defined as ‘the rise of new communities and the formation of new social identities and relations that cannot be defined through the traditional reference points of nation states’ (Robinson 2008:137). It is generally referred to as a concept that includes a variety of processes that takes place concomitantly at the local and global levels. Immigration studies define transnationality as the activities of immigrants to ‘forge and sustain multi-strand social relations that link their societies of origin and settlement as a single unified field of social action’ (Basch *et al.* 1994). Transportation and communication networks have connected origin and settlement locales, forging new ‘transnational spaces’. Theorists have challenged these polarized categories, and see these connections as both forging and fueling globalization. The agents involved are both ‘subjects and objects [of globalization]’ (Robinson 2008:137). Theories of transnationality have had a minimal impact on archaeology although have informed some studies, especially to those of more contemporary diasporas, such as the Irish Diaspora to the United States (e.g. Brighton 2009).

2.3.5 *Cultural Theories of Globalization*

Cultural theories concerning globalization include a range of approaches that address the local or subjective dimensions. These have also been denoted broadly as theories of a ‘global culture’ and differ from the aforementioned approaches where discussions of economic and political components are pronounced. Cultural theories of globalization tend to belong to one of three positions: homogenization, heterogeneity or hybridization and both universalism and particularism are themes found across each (Robinson 2008). Homogenization theories view global cultural convergence, and highlight universal objects and behaviours and cosmopolitanism. The more recent term ‘McDonaldization’, refers to this and is founded in this particular approach (Ritzer 2002; Nederveen Pieterse 2004). Heterogeneity approaches see a resistance to this homogenization, for example, fundamentalism is seen as a rejection of uniformity (Robinson 2008). Appadurai (1990:140–141) further discusses this juxtaposition and establishes it as the ‘central problem of today’s global interaction ... the tension

between cultural homogenization and cultural heterogenization'. Additionally, clashes (warfare) and polarization are also seen as problems associated with globalization. Hybridity approaches stress a merging of culture and identities as a product of transnational processes. These three different approaches present very broadly the different manners in which global cultures may be interpreted. The strength of cultural theories of globalization is that they examine multiple social, political and economic processes. It is for this reason that a global cultures model has been employed in this research, and the model used in this thesis borrows from all three arms: homogenization, heterogeneity and hybridity.

2.4 Past Globalizations and Archaeology

It was in the 1980s that archaeology as a discipline began to stress that understanding a site within the context of the surrounding region was vital to understanding local changes. Effectively, no archaeological site can be understood in isolation, nor can local changes be attributed to the external arena—the interplay between both must be examined to understand these developments (Hall and Chase-Dunn 1993; Hall *et al.* 2011). Prior to this a neo-evolutionary paradigm persisted, which had emphasized environmental factors as the reagent for social complexity. Such dialogues typically excluded interaction as motivating internal changes within a society (Trigger 1984). In these early approaches varied techniques were used to examine interactions including rank-size distributions, catchment analysis, central-place models and spatial statistics (Salisbury 2009). It was also at this stage that Fried's 'pristine social formation'—a model which considered changes occurring in isolation—was challenged and largely rejected (see Sabloff and Lamberg-Karlosvky 1975). Early perspectives include interaction spheres (Caldwell 1964), trade studies (Adams *et al.* 1974), world systems theory (Wallerstein 1974), cluster interaction (Price 1977), and peer-polity models (Renfrew 1986).

Stein (1998:903) highlighted that the archaeological interest in interaction and culture-contact was paralleled by an increasing focus on globalization, transnationalism and colonialism in anthropology. Different theoretical frameworks and a variety of models emerged. These various models acknowledge the diversity of contact relationships, including the variability between the 'degree of negotiation, acceptance, resistance, and tolerance between social systems' (Dillehay *et al.* 2006:249). Schortman and

Urban (1987) and Stein (2002) relate the varied nature of these processes to the local degree of political complexity, geography, cost of transport/distance, military and the objectives of the society involved in the contact i.e. agency.

The above section highlighted globalization theories more generally; however, it dealt mainly with contemporary transdisciplinary applications of these frameworks. LaBianca and Scham (2006) were the first archaeologists to explicitly engage with and discuss the social dimensions of globalization with globalization theorists (i.e. the application of ‘The Network Society’ to archaeological contexts). Investigating globalization in the past in the archaeological record requires shifting the lens beyond contemporary contexts. How then can archaeologists incorporate the aforementioned theoretical frameworks into their disciplinary research? This section aims to address this, by examining how past globalizations will be examined in this thesis.

2.4.1 Globalization in the Past: Varied Approaches

This section deals with the timing of globalization and how this is addressed across disciplines and paradigms. The more conventional approach to understanding the phenomenon treats globalization as the corollary of the modern era. As such, it closely resembles prior Marxist approaches which suggest that the process is contingent on another i.e. the spread of the world-market. Counter-arguments to the paradigm suggest that the approach centres on capitalism, thus being Eurocentric and ultimately a theory of ‘Westernization’ (Nederveen Pieterse 1994). This section outlines two more recent approaches to understanding the process, which bring past globalizations into the ambit of the discourse. These include: (1) ‘long-term’ approaches and (2) WST based approaches (Jennings 2011).

Table 2.1. Interpretations of the timing of globalization (after Jennings 2011; Nederveen Pieterse 1995:47).

Author	Beginning	Theme / Paradigm
McNeil	-	Control of Fire
Nederveen Pieterse	-	Origins of Agriculture
Marx	1500s	Modern capitalism
Wallerstein	1500s	Modern world-system
Robertson	1500s, 1870s-1920s	Multidimensional
Giddens	1800s	Modernity
Tomlinson	1900s	Cultural planetarization

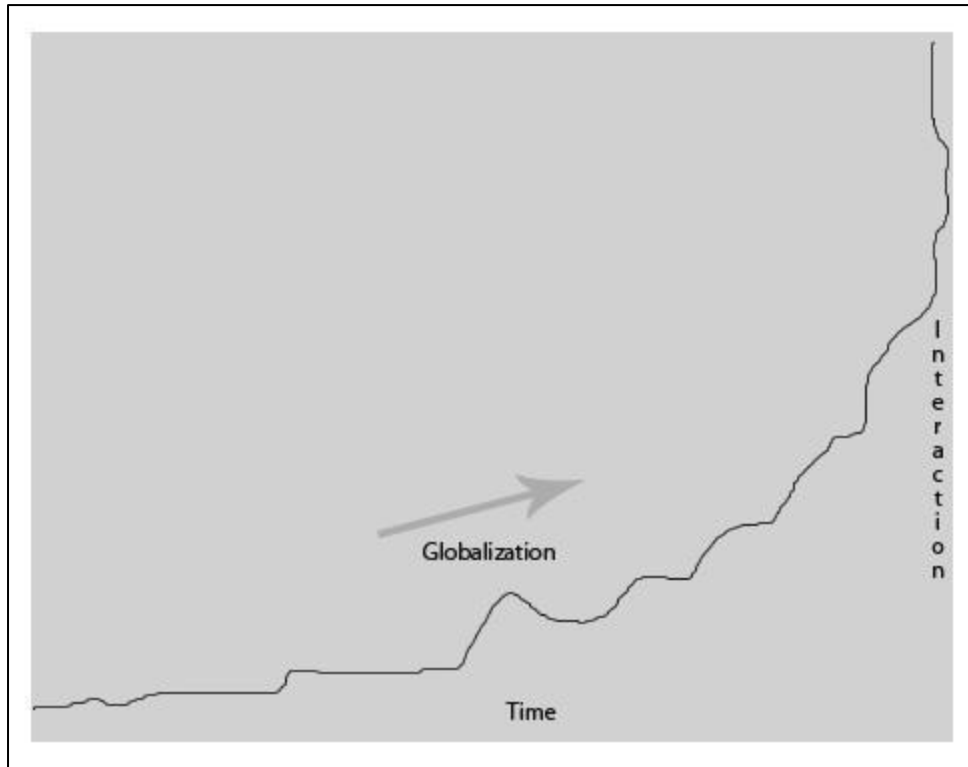


Figure 2.2 Globalization as a long-term process

Credit: Adapted from Jennings (2011:9)

The first considers the phenomenon as a long-term process, with an intensification of interaction in the more recent period. This ‘long-term’ approach became established post-2000 and was a reaction to globalization histories by scholars who considered prior research insufficient, because older events had been excluded from the dialogue. Divergent interpretations exist pertaining to the time-depth at which globalization begins (see Table 2.1). Nederveen Pieterse (1994) considers this to be associated with the development of agriculture. A theory relating it to the initial dispersal of humans is presented by Clark (1997) and Chanda (2007) and McNeil argues the origins emerge from the control of fire and describes it as ‘an age-old process expanding the human niche in the Earth’s ecosystem’ (2008:8). Despite a lack of consensus over the stage at which globalization began, all adherents of the ‘long-term’ approach agree that it involves an intensification of earlier actions and processes. The second approach views past globalization as episodes or as ‘discrete bursts of interaction’. Although, WST does not explicitly refer to globalization, this is the approach to which most WST based approaches adhere.

2.4.2 Identifying past globalizations in the archaeological record

'If we want to explore the possibility of globalizing moments in the past that had similar cultural consequences to those that we are experiencing today [and] then we need to look for globalizations in the plural.'
(Jennings 2011:13)

This thesis combines both the 'long-term' and WST based approaches in order to gain useful insight into globalization. The long term approach identifies past globalizations and the WST approach identifies individual episodes. This hybrid approach developed by Jennings (2011), enables us to examine past globalizations and also the associated processes by identifying multiple episodes that might then be compared.

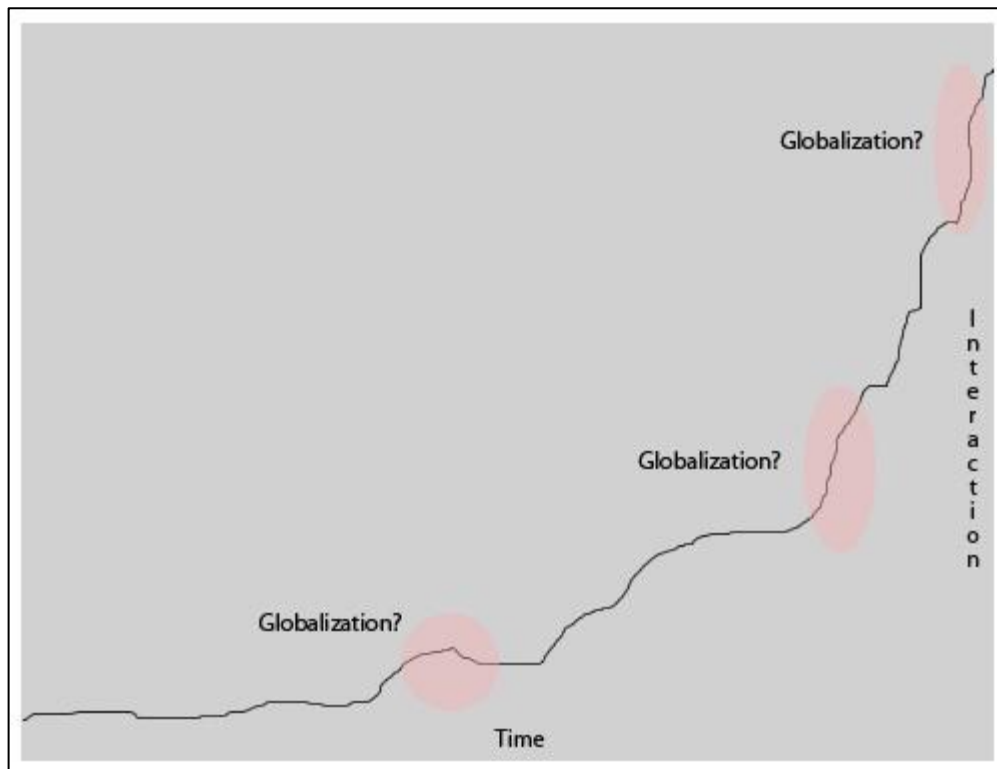


Figure 2.3 Multiple globalizations in the past

Credit: Adapted from Jennings (2011:9)

It is important then to ascertain how past globalization periods can be identified. This cannot be discerned from just identifying increasing interaction, but can be established through examining the impact on the recipient culture. Therefore, past globalizing moments involve:

- (1) an increase in interregional interaction; and,
- (2) the creation of a ‘global culture’.

The first criteria can be plotted according to recognized upsurges in interaction through time (Tomlinson 1999). For example, it is clear that in the recent period, interaction has increased in scale, density and distance owing to technological advancements. For the purposes of this thesis earlier increases of interaction must be considered and phases of interaction in the Indian Ocean are discussed based on the archaeological and historical record in the following chapter—Chapter Three.

The second criteria—the creation of a ‘global culture’ is defined here after Jennings (2011). Firstly, what constitutes a culture, can be seen as a product of daily interactions with the immediate family and community, therefore, by increasing interactions with far-reaching cultures—such as in globalization—an impact on the ‘number, depth and variety of connections between people across regions’ will result in changes witness in the local social context (Jennings 2011:11). These changes result in what has been termed a ‘global culture’.

There are eight hallmarks which Jennings specifies as integral to defining a global culture. These include:

1. Time-Space Compression
2. Deterritorialization
3. Standardization
4. Unevenness
5. Cultural Homogenization
6. Cultural Heterogeneity
7. Re-embedding of Local Culture
8. Vulnerability

Whilst, not all these criteria will be evident in all contexts, as ‘we should expect that past global cultures were as inherently fractured, messy, and contingent as the one we live in today’ (Jennings 2011:123). These are defined as follows, although will be further detailed in Chapter Nine and discussed in terms of the early occupation period

of the Maldives. The first is *time-space compression* and it involves social and economic processes which speed up transport or provide the faster receipt of goods. *Deterritorialization* happens when the local culture becomes ‘abstracted’ from a time and space—or a geographical location (Appadurai 1990). The local and global merge owing to the cultural fusion from a varied range of foreign inputs. *Standardization* is the consequence of multiple people operating outside of fixed locales and facilitates translation between the two. The fourth hallmark is *Unevenness*. This involves a power dynamic as similarly described in WST and the network society. Essentially not all places share the same level of connectedness and not all locations are visible on the world stage, which can also be related to the physical isolation of regions with limited resources and scattered populations. *Cultural homogenization* constitutes the fifth characteristic. This has been previously described as ‘McDonaldization’, where a widespread distribution of objects and people, are adopted by other people. This entails a ‘diffusion of a way of being, from musical forms, architecture, and modes of dress to eating habits, languages, philosophical ideas and cultural values and dispositions’ (Inda and Rosaldo 2008). This is counterbalanced by *cultural heterogeneity*, which involves new modes of living arriving through globalization processes (Gupta and Ferguson 2002). The *re-embedding of local culture* is a reaction to the new influences associated with globalization or the ‘deliberate choice to turn inward’. The final hallmark is *vulnerability* which is associated with locations becoming increasingly dependent on actions which occur in other places around the world.

2.5 Summary

This chapter outlined a useable definition for globalization in this thesis, which follows recent definitions that focus on process. A review of WST, global-capitalism, the network society, transnationalism and transnationality and also cultural theories of globalization followed. The manner in which globalization frameworks might be applied to archaeological research was then discussed, and Jennings’ (2011) hybrid model of a global culture was deemed the most profitable. The global culture model will be explored in Chapter Nine, through the use of the archaeological and historical data presented in Chapters Three–Eight of this thesis to explore past globalization episodes in the Indian Ocean.

3

Periods of Indian Ocean Interaction

3.1 Introduction

The history of the Indian Ocean documents widespread exchanges between people from India, Sri Lanka, East Africa, China, the Gulf, the Red Sea, the Mediterranean and Southeast Asia. It was the movement of commodities and their associated agents, which transformed it into a cosmopolitan space, most famously through the trade in spices from the first millennium BCE onwards—although ‘more ink has been spilt on this than it objectively deserves’ for it was just one component of the larger corpus of traded items exchanged throughout the Indian Ocean (Pearson 2003:153). Evidence for interaction has been documented in the archaeological record, with early examples including the movement of Ubaid pottery, from Mesopotamia onto sites in the Gulf, as far back as the sixth millennium BCE (Boivin and Fuller 2009). Interactions as recent as the import of slaves into the Mascarenes in the latter part of the last millennium have also been documented by archaeologists (Appelby *et al.* 2012; Seetah 2010; Seetah *et al.* 2011).

The previous chapter outlined and evaluated theoretical frameworks able to examine early globalization in the region, this chapter aims to contextualize this study by presenting an established timeline of cross-cultural exchanges and biological translocations during relevant temporal periods. An exhaustive review is well beyond the scope of this research; see Fuller *et al.* (2011), Boivin and Fuller (2009), Pearson (2003), Ray (2003), Sidebotham (2011), Tomber (2008), Seland (2014), Reade (1996), Chaudhuri (1985) and Hoogervorst (2013) for more in-depth examinations of interaction during the time periods discussed. This background chapter has benefitted

significantly from these syntheses and represents an evaluation of phases based on the literature.

3.2 Defining the Physical Parameters

Indian Ocean interaction was shaped by two principle factors: physical limits and social dynamics (Beaujard 2005:411). These parameters comprise the major invariant matters that constrain or facilitate human movement (Lee 1965). Pearson (2003:1) refers to these as ‘deep structure’ elements, a concept borrowed from Braudel and methodological structuralism, suggesting that any interaction exists only on base structures. Whilst Pearson also identifies several non-physical parameters as invariant factors guiding maritime initiatives throughout the Indian Ocean i.e. piracy (Gupta 2007), this section is concerned only with the physical elements.

3.2.1 Geographical Parameters

The geological processes responsible for the contemporary Indian Ocean and its littoral regions began in the early Paleozoic (c. 540 million years BP). By the Miocene period (25–12 million years BP) the Indian Ocean was approaching its current dimensions, when the Red Sea opened and the Afro-Arabian continent separated (Reddy 2013). Today, the Indian Ocean covers 27% of the Earth’s maritime space and is the third largest ocean behind the Pacific and Atlantic (Pearson 2003:14). Pearson provides a definition of the boundaries, which was built on that initially established by the International Hydrographic Organization (IHO) (1953:22). These limits extend from Cape Agulhas in South Africa (20°E to 110°E) around the East African coast to the Gulf to include the Red Sea. The northern limit extends beyond South Asia and the Bay of Bengal, which meets the eastern limit—the Sunda Deep. The eastern edge involves a bathymetric boundary dividing the Southeast Asian and Indian Ocean maritime regions, beyond this area the monsoons shift and a later formation of the south-west monsoon occurs (Pearson 2003:2; Gupta 2004). The western limit stretches southwards along coastal Western Australia to Cape Leeuwin (Pearson 2003); although the IHO (1953) consider these boundaries extend further east to Tasmania and down to Antarctica. There are several smaller seas, gulfs, bays and straits considered a part of the Indian Ocean region, which include: The Red Sea, the Persian Gulf, the Bay of Bengal and the Andaman Sea.

Although it is impossible to outline all physical structures which impacted movement in the region, some select examples highlight the diversity of the area. The presence of impeding geographical entities backing coastal fronts complicated inland exchange in some areas. Examples provided by Pearson (2003) include the southern region of Kerala, which is fringed by the Western Ghats and likewise, the Swahili coast, which is backed by the *nyika*, a 'barren hinterland' (Sheriff 1986:8). Maritime 'choke points' are also very relevant, and their presence prohibits ease of interaction; examples include the straits of Melaka near Singapore or Hormuz in the Gulf (Pearson 2003). Historical sources also highlight some of the dangers present, for example Al Masudi, the Arab historian and geographer, and the anonymous author of the first century CE *Periplus of the Erythraean Sea*, both write of the hazards of the Red Sea. The latter describes it as 'dangerous, without harbours and with bad anchorages' (Casson 1989) and Al Masudi suggests it is the 'most dangerous of the seas and gulfs ... sterile shores and depths of the sea ... (where) ships sail only by day ... (for) its darkness and the fear it inspires (Al Masudi 2007:61–62). Furthermore, reef areas surrounding coral atolls, such as the Maldives, also proved problematic for providing safe anchorage and harbour. Contra to this, several factors facilitated movement, for example the fertile Hadramawt coastal area (Southern Arabia), was strategically located, enabling resupply for southwards voyaging to Eastern Africa or west towards South Asia (Pearson 2003).

Islands in the Indian Ocean include Madagascar, Sri Lanka, Socotra, the Seychelles, Mauritius, Reunion, Comoros and coral atolls such as Cocos Keeling and the Maldives (Pearson 2003:16). A point raised by Anderson *et al.* (2009) was that Indian Ocean seafarers took a relatively long time, with lower success to find fewer islands, than the colonizers of the Pacific. Additionally, with the exception of Madagascar, a large island (587,000km²), the remote islands have a mean size of one-third of that of remote tropical Pacific islands (total land area of 7800km² compared to 166,000km²). The small size of most of these islands could account for their later occupation, despite the Indian Ocean's earlier human use and navigation; however, Anderson *et al.* (2009) suggest the reason for their later occupation still remains somewhat of a 'conundrum', especially in light of the extensively developed continental coastal areas.

3.2.2 Weather Systems: *The Monsoon and Southeast Trade Winds*

Several weather systems are relevant to this research and include the monsoon and the southeast trade winds (see Fig 3.1). The first is the most definitive of Indian Ocean trade and the English name ‘monsoon’ is derived from the Arabic *mawsim*—a term originally employed to signal the fixed period of time required for Arabic *dhow*s to sail between ports (Chaudhuri 1985; Chaudhuri 1993; Reade 1996; Pearson 2003; Gupta 2004; Boivin *et al.* 2013). The monsoon has predictable patterns that reverse seasonally compared to the ‘year-long prevailing winds’ witnessed in other areas such as the Atlantic (Pearson 2003). The South Asian Monsoon, is one of Earth’s most intense annual climatic elements, and is integral to the livelihood of many communities around the Indian Ocean—it supplies moisture to the land, and the wind regime assists ocean voyaging (Betzler *et al.* 2016). Chaudhuri remarked that it was ‘the predictability of a homeward wind [that] made the Indian Ocean the most benign environment in the world for long-range voyaging’ (1993:1). These ‘sea-lanes’ were augmented by the northern caravan routes, which contained ‘two-humped camels, horses and mules as transport’ (Chaudhuri 1985:39).

In very basic terms, as Pearson (2003:19) outlines, the monsoon’s formation is a consequence of the Earth’s rotation and climate—during the summer months, heat warms the continental land mass, causing hot air to rise and the formation of a low pressure area over the Earth’s surface; moisture from the ocean moves into the zone, rises, and results in cloud formation and heavy rain. In winter this pattern is reversed, with wind moving away from the land owing to the slower cooling of the ocean. Monsoon winds have not altered significantly since the time period under investigation, and therefore current navigational charts can be used in concert with historical descriptions to reconstruct seasonal sailing patterns (Seland 2011; Seland 2014). In addition to obvious impacts on navigation, the monsoon also brought precipitation to the connected land masses including the Ethiopian and Yemeni highlands, South Asia and parts of Southeast Asia (Gupta 2004:134).

The division between the south-west monsoon from May to September and the north-east monsoon present during November to March, divided the year into two halves, forming the old Indian Ocean solar calendar. The north-east monsoon was the ‘major player’ as it blows consistently and essentially never reduces to a flat calm. This

monsoon would deliver ships from the Red Sea and Arabian Gulf to India and south to East Africa (Reddy 2013). The Greeks discovered the Indian Ocean monsoon in the third century BCE and called it the *hippalus*. This discovery resulted in the florescence of western commercial interests in the Indian Ocean (Gupta 2004:124). The south-west monsoon was less stable, with stronger winds and heavy rainstorms present. It was as possible though substantially more dangerous to cross the Indian Ocean outside of monsoon seasons (Seland 2011).

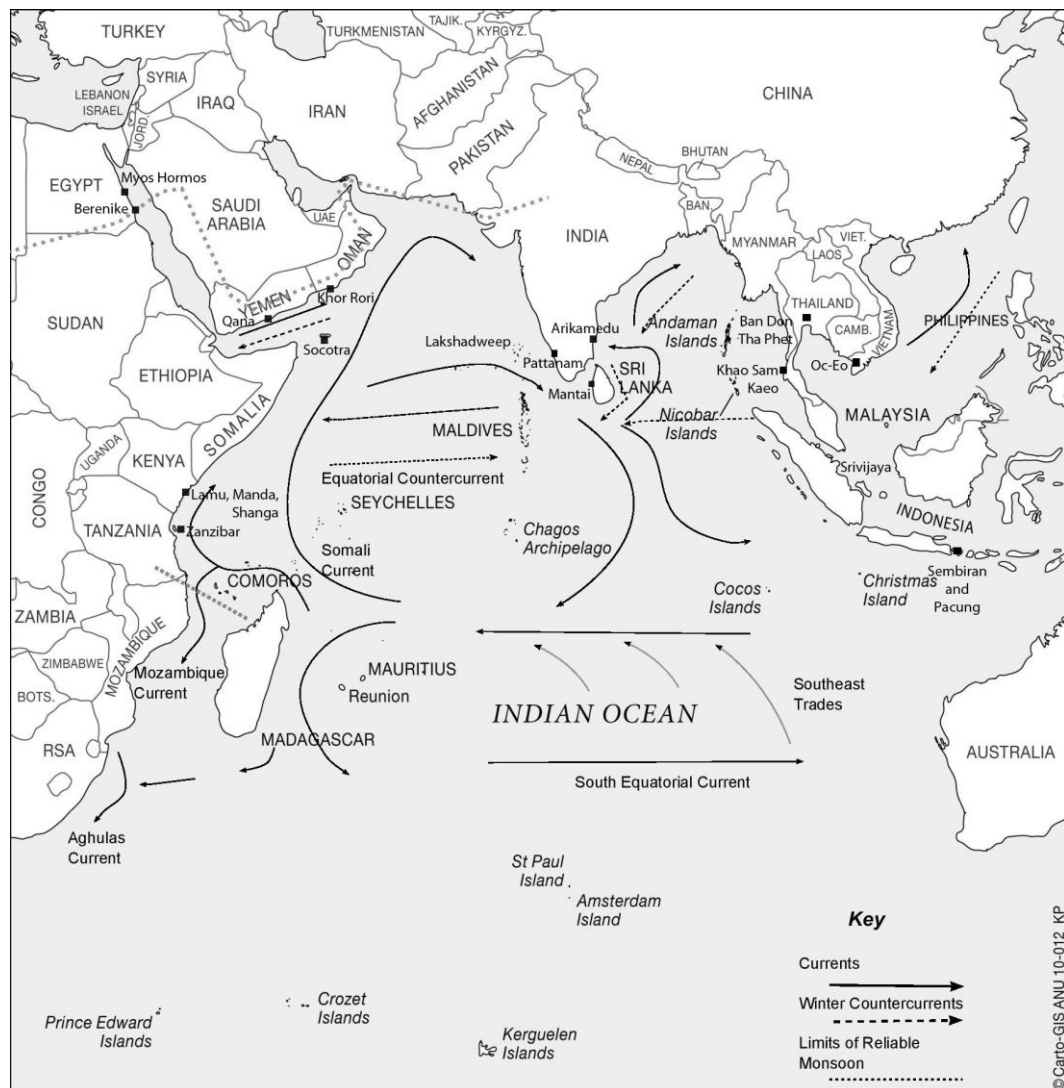


Figure 3.1 The Indian Ocean. Indicating locations discussed in the text, currents and counter-currents and limits of reliable monsoon (after Boivin et al. 2013).

Credit: Carto GIS, Australian National University and Mirani Litster

Between June and August the winds were so strong that the west and east coasts of India were unable to be reached (Agius 2008). The further south travelled, the weaker

the monsoons. Additionally, the southeast trade winds, which are driven partly by the south-equatorial current, are present at 15°S to 30°S and it is through this belt and not within the monsoon system, that the likely movement from Island Southeast Asia to Madagascar would have occurred (Pearson 2003:23).

3.2.3 Currents, Tides and Waves

The presence of particular currents that limited or facilitated maritime travel have been outlined by Boivin *et al.* (2013), which follows Pearson (2003) and are reiterated here. The currents in the Indian Ocean which ‘were more of a problem *or* an opportunity’ were situated along the East African coast and include: the Somali Current, Mozambique Current and the intense Agulhas Current. The South-Equatorial Current (SEC) and the Equatorial Counter-Current (ECC) are situated centrally; the latter is the most relevant to the Maldives, as can be seen in Fig 3.1 (Pearson 2003; Boivin *et al.* 2013). Furthermore, tides were especially hazardous in narrow waterways, such as those in the Red Sea and the Gulf. Pearson (2003:25) describes the effects of tides being felt 160km up the Shatt al Arab and into the Tigris. Waves potentially inhibited safe anchorage along coastal areas, as was the case along the west coast of India and Malaya. Wave action was less of a problem for maritime voyaging along East Africa.

3.3 Early Exchanges (Pre-1000 BCE)

Early examples of interaction in the region can be seen during the sixth millennium BCE, with exotic material culture present in archaeological sites in the Persian Gulf/Gulf of Oman region. The most ‘striking’ is the presence of Ubaid pottery from Mesopotamia found in over 60 Neolithic sites of the Arabian Bifacial tradition (Carter 2006; Boivin and Fuller 2009). Radiocarbon dates for the presence of this pottery span from the second half of the sixth millennium BCE through to the fifth millennium BCE (Boivin and Fuller 2009:123). Early interpretations suggested that the vector for this movement were the Persian Gulf inhabitants; however, recent interpretations suggest an Arabian agency, which is plausible owing to the Ubaid pottery being ‘intrusive’ elements present in sites otherwise dominated by Arabian Neolithic materials (Lawler 2002; Carter 2006; Boivin and Fuller 2009:123). During this period other traded materials were present in the area, such as obsidian recovered in Yemen, with preliminary source studies suggesting an Ethiopian provenance, pointing to movements across the Red Sea (Khalidi 2010).

During the Bronze Age Period from 3500 BCE to 2000 BCE, an intensification of maritime interactions was apparent, building on those networks established by the earlier ‘small scale maritime societies operating in a pre- or proto-urbanized setting’ occurred (Boivin and Fuller 2009). This period as defined by Boivin and Fuller (2009) correlates to that which Gupta defines more broadly as ‘the beginnings of exchange’ involving near-shore watercraft utilizing ‘nucleated communities’ during the fourth to third millennium BCE (Gupta 2004). Incense such as frankincense (*Boswellia sacra*) and myrrh (*Commiphora* sp.) grew in the ‘aromatic rich’ monsoon belt region between the Wadi Hadramawt, Dhofar and northeastern Africa and were traded through networks to Egypt from the fourth millennium BCE (Peacock and Peacock 2006; Boivin and Fuller 2009). In the latter part of the third millennium BCE, as pointed out by Boivin and Fuller (2009), it was apparent that coastal Omanis were heavily involved in trade, with abundant evidence of exchange with Harappa—carnelian, combs, metal, seals, Indus black slipped ware and weights were all present in eastern Arabia (Cleuziou and Tosi 1994; Possehl 1996; Potts 1993; Vogt 1996). Additionally, one of the earliest exotic pieces of wood found in the area, Indian Rosewood (*Dalbergia sissoo*), potentially has an Indo-Iranian provenance although the reliability of the wood identification is not secure (Tengberg 2002). Nonetheless, the overwhelming presence of other Harappan material supports the occurrence of exchanges between these two regions (Boivin and Fuller 2009).

From 2000 BCE, the trading sphere of the Red Sea was brought into ‘the remit of an extended India-Gulf trading network’ (Fuller *et al.* 2011:546). Fuller *et al.* (2011) attribute this to the activity of coastal societies of Southern Arabia or the movements of Gujarati seafarers and also mention an ‘undetermined source in Africa’. Five African crops reached South Asia by the closing of the second millennium BCE; however, the manner in which these were moved remains unknown (Boivin *et al.* 2014). Movement in the opposite direction from east to west c. 2000 BCE is supported by the appearance of the broomcorn millet (*Panicum miliaceum*) in Pakistan, Yemen and Nubia by approximately 1700 BCE, with an original cultivation area of Northern China (Fuller *et al.* 2011). Zebu cattle, contemporarily referred to as Brahman cattle, were also likely moved from India to Yemen and East Africa during this period (Fuller *et al.* 2011). At the end of the second millennium BCE, the recovery of black

peppercorns from the nostrils of Pharaoh Ramses II burial at approximately 1200 BCE, suggests a spice trade between South Asia and the Red Sea area as pepper (*Piper nigrum*) is a spice endemic to southern India (Plu 1985; Fuller *et al.* 2011). This considerable evidence supports a case for intensified interaction in the Red Sea-Gulf-Indian region during this period.

The eastern portion of the Indian Ocean saw other translocations and exchanges taking place in a westward direction prior to the first millennium BCE. This includes evidence for Southeast Asian arboriculture species in India with wood charcoal specimens of probable mango and citrus found in sediments dated to 1300–1400 BCE. Despite these being contextual dates, the additional translocation of Sandalwood (*Santalum album*) from Indonesia to India at approximately 1300 BCE, provides further evidence for pre-first millennium BCE mobility in the region (Asouti *et al.* 2008; Hoogervorst 2013). Hoogervorst (2013:13) highlights that those responsible would have been insular Southeast Asians who acquired the sandalwood from Nusa Tenggara. This coincides with the initial settlement of Remote Oceania by Malayo-Polynesians, indicating that they had the seafaring capacity to undertake such a voyage in an equivalent westerly direction.

3.4 Open Sea Voyaging: First Millennium BCE interactions (1000 BCE–0)

Proxy evidence of widespread transfers between Southeast Asia, India and the Red Sea suggest that the first millennium BCE period involved open sea voyaging and therefore required navigational knowledge of the monsoon and currents. We know that the Greeks understood the monsoon system by at least the third century BCE, and referred to it as the *hippalus*. It was this integration of the littoral regions, which resulted in an extensive and ‘flourishing’ Indian Ocean trade by the two centuries prior to the BCE/CE transition (Magee 2010; Walz and Gupta 2013:45). Major interactions will be reviewed here as defining examples of Indian Ocean exchanges during this period. These are covered in Western Indian Ocean, South Asian and Southeast Asian categories. Finally, links to the Mediterranean are explored mainly through evidence recovered from Gulf and South Asian contexts.

3.4.1 *The Western Indian Ocean*

Both Fuller *et al.* (2011) and Gupta (2005) highlight several intentional transfers i.e. banana, cinnamon and chickens, and other non-intentional transfers i.e. commensal plants and animals, as significant to our understanding of inter-regional interaction during this period and these are summarized here.

Phytolith research suggests banana (*Musa* spp.) was cultivated in the Malesian region, with an arrival on the African continent prior to the colonization of Madagascar c.500 BCE, as documented in the archaeological record of Cameroun (Mbida *et al.* 2000; Kennedy 2009); however, less veracious claims of earlier *Musa* spp. in Uganda exist (Lejju *et al.* 2006). There was also demand for the Sri Lankan spice—cinnamon—in the Western Indian Ocean from the early first millennium BCE (Gupta 2005). Fuller *et al.* (2011) also discuss the use of chicken as a staple in African villages. The red junglefowl (*Gallus gallus*) originated from the expanse of North India, Southeast and East Asia. Historical linguistic data points to three separate introductions to Africa with only one from the Indian Ocean; however, contextual archaeological information for these introductions is still lacking and although ‘chickens appear to be deeply culturally embedded in West and Central African subsistence, suggesting considerable time-depth to their presence’ (Williamson 2000; Fuller *et al.* 2011). Further archaeozoological investigations, especially studies on aDNA, need to be conducted in order to substantiate claims of an early or first millennium BCE introduction of chicken to Africa.

Fuller *et al.* (2011) also highlight non-intentional transfers which shed light on the movement of people during this first millennium BCE context. This involves evidence for the presence of commensal organisms, or those which live in close association with other organisms for the purpose of deriving benefit. Horse purslane (*Trianthema portulacastrum*) has been frequently recovered at Harappan sites in Gujarat (Weber 1991) and in South Indian contexts from Early Historic Period sites (300 BCE) and has subsequently also been recovered in Southeast Asian and African contexts, although no dates for this lateral dispersal exist (Fuller *et al.* 2011). Evidence for the movement of commensal animals also exists, including the movement of the house mouse (*Mus musculus*) during the first millennium BCE, which was introduced to Madagascar via Yemen from India (Duplantier *et al.* 2002; Fuller *et al.* 2011). The

Asian house shrew (*Suncus murinus*) was also introduced to East Africa and the Arabian Peninsula from South and Southeast Asia during this time period (Boivin and Fuller 2009). As with the above mentioned study of chicken, aDNA investigations into the movement of the commensals such as *Suncus murinus* and *Mus musculus* are essential to provide confirmation for these movements, and therefore valuable insight into the movement of people who were integral to their translocation.

3.4.2 South and Southeast Asia

Whilst interaction between South and Southeast Asia tends to be discussed in a first millennium CE context, evidence for exchange exists during this earlier period. These discussions have also tended to focus on a west to east direction, with less evidence for the movement of Southeast Asian material in a westerly direction (Hoogervorst 2013). The majority of studies discuss the timing and incorporation of Indian religious, political and artistic features into MSEA and ISEA (Bellina 2003; Bellina 2004; Manguin and Indradaja 2011; Manguin *et al.* 2011). Additionally, recent interpretations of what has been previously seen as foreign South Asian introductions to Southeast Asia have been revised to suggest that these were indigenous phenomena, such as semi-urbanization and metallurgy (Glover *et al.* 1996:130).

However, evidence for contact between South and Southeast Asia during the mid-first millennium BCE is undeniable—Indian objects and technologies such as beads and iron and glass working appeared in mainland Southeast Asia at this time. The widely accepted earliest evidence for economic exchanges between the two areas is presented by Glover and Bellina (2011) with South Asian finds from Ban Don Ta Phet and Khao Sam Kaeo in Thailand dating to approximately 200 BCE–400 CE. It was this discovery that resulted in the beginnings of an archaeology of ‘proto-historical’ and ‘historical’ Southeast Asia (Bellina 2003; Glover and Bellina 2011; Manguin 2011).

Manguin terms particular objects during this phase as ‘markers of exchange activity’ (2011:xix). These include Northern Black Polished Ware (NBPW) from the Gangetic Valley in India, dated between 800 BCE to the BCE/CE transition and Rouletted Ware (RW) which has been recorded from the eastern seaboard of the subcontinent down to Sri Lanka with associated dates of between 300 BCE–300 CE (Gupta 2005). Gupta (2005:24) reasonably posits that the distribution of NBPW and RW at sites in

Southeast Asia suggests an intensification of activity throughout the Bay of Bengal in the latter half of the first millennium BCE. Stone and glass beads of an Indian origin are also present at sites throughout Southeast Asia, from the later first millennium BCE, although research has been conducted to investigate local material sourcing and transmission of technology (Theunissen *et al.* 2000; Glover and Bellina 2011). Further investigations into local materials and technological advances will likely resolve this issue further. Pottery recovered at Khao Sam Kaeo, with a borrowed Indian slip technique, suggests that Indian craftsmen were probably on the Thai peninsula during the same period (Bouvet 2011). Phu Khao Thong on the Andaman Coast of Thailand has also returned pre-first millennium CE dates associated with foreign exchanges, including rouletted wares from the second century BCE—a period similar to those recovered at Arikamedu (Chaisuwan 2011).

All of this evidence, considered to be ‘markers of exchange activity’, reasonably establish an intensification of interaction in this region. However, the presence of South Asian material culture in MSEA and ISEA does not indicate direct exchange, as it may well have been traded down-the-line. Moreover, unlike carnelian bead studies, limited research into the chemical characterization of Indian ceramics in MSEA and ISEA have been conducted to confirm their Indian origin, which would serve to scaffold their purported South Asian provenance.

A more concrete line of evidence indicating direct Indian and Southeast Asian interaction during this period, includes the presence of a likely trader of ‘Indian’ extraction at Pacung III, Bali during the late first millennium BCE (Lansing *et al.* 2004). A human tooth was recovered from these excavations, and aDNA analysis of the material revealed it to be of a likely Indian ‘extraction’ (although the reliability of the study has been questioned). Recent excavations at Pacung and Sembiran have strengthened the arguments for these late first millennium BCE dates for Indian-ISEA contacts, based on a series of new dates, and further comparative analytical evidence. RW has been recovered in newly dated contexts at Pacung (200 BCE), which is contemporary to that previously recovered at Batujaya in Java (Manguin and Indradaja 2011; Calo *et al.* 2015).

Hoogervorst (2013) highlights that substantiation for Southeast Asian interaction with South Asia in a westwards direction during this period is largely related to the presence of carved paddle-impressed pottery at sites in India and Sri Lanka (Solheim and Deraniyagala 1972; Selvakumar 2011). Selvakumar (2011:207) argues that the technology has a Southeast Asian origin where it appeared in contexts prior to those in South Asia. The impressed pottery is apparent at sites from the Late Iron Age in the later centuries of the first millennium BCE at Pattanam, India. The initial contexts were associated with the Indian ‘megalithic’ period, however it was more common in coastal areas of South India in the Early Historic context (Selvakumar 2011:207; Hoogervorst 2013). Bellwood (1997) suggests a potential Indian origin for this pottery. Solheim and Deraniyagala (1972) proposed that the ware in Sri Lanka was of Southeast Asian origin. This pottery also occurs in Western Indian Ocean sites, including Egypt, the Maldives, West Africa and Yemen (Begley and De Puma 1991; Selvakumar 2011; Skjølsvold 1991; Tomber 2008). Because of the ubiquity of its presence throughout the Indian Ocean—and the simple method of manufacture—caution needs to be exercised when ascribing cultural diffusion as a vector for its extensive distribution.

Furthermore, as Hoogervorst (2013) points out, Solheim and Deraniyagala (1972) argued for a potential Southeast Asian introduction of the Sri Lankan urn burial tradition, which involved a secondary urn or jar burial. Gupta (2005:22) supports this notion, suggesting that this burial tradition, which has a beginning of the late second millennium BCE, may have been associated with Southeast Asian voyaging across the Bay of Bengal. These burials have a wide distribution across the ‘Indo-Pacific arc’, although are not the same ‘at every point of distribution’, with a presence in ISEA, MSEA (Vietnam, Cambodia, Laos and Thailand), East Asia (Japan) and also in South Asia (northern Sri Lanka and the urn fields of the deep southeast of India) (Gupta 2005). However, this tradition was widespread, with a considerable time-depth in South Asia, therefore this introduction should, as with the presence of paddle-impressed ware, be accepted with caution (Hoogervorst 2013).

3.4.3 Links with the Mediterranean

Early Greek captains were present in the Indian Ocean during this period, including the first Greek captain in the Arabian Sea, Scylax of Caryanda c. 510 BCE, and

Nearchus of Crete in the Gulf c. 326–325 BCE, with the latter providing an early account of pearl fishing (Pearson 2003:52). Several major ports were operational in the Red Sea including Berenike (300 BCE–600 CE) and Myos Hormos, both of which had connections with the Mediterranean and transferred goods to India and Barygaza in the Gulf of Cambay (Blue 2002; Blue 2007; Peacock 2011; Sidebotham 2011). Although their establishment predated the Roman period these two locations would later become major centres through which ‘Indo-Roman’ exchange would take place throughout the first millennium CE.

Material culture finds undeniably support early Mediterranean connections and include the recovery of Roman artefacts mainly from sites in the Red Sea, the Gulf and India; however, further evidence exists in Afghanistan and China among other places during this period (Pearson 2003; Ray 2003; Magee 2010). In India the links to the Mediterranean closely predate the BCE/CE transition and are demonstrated by the presence of Roman amphorae with an ‘uninterrupted ... sequence’ from the mid-first century BCE to the late second century CE (Gupta 2005:26). Important to note, the material found in Indian contexts suggests trade with the Indo-Roman ports in the Red Sea and not a direct link to the Mediterranean. Furthermore, *Terra sigillata* has been found on the South Indian coast, Roman coins have been recovered throughout South India and Mediterranean lead was recovered from the Satavahana coinage of the central and eastern Deccan (Bellina 2004). A type example includes finds recovered from the South Indian site of Pattanam (identified recently as the urban centre and large port of Muziris), which included the recovery of Mediterranean glass, Roman *terra sigillata* pottery and amphorae found in contexts from the first century BCE onwards (Cherian et al. 2007; Seland 2014).

3.5 Indian Ocean Interaction Sphere: First Millennium CE Interactions and Beyond

The first millennium CE is aptly defined by Gupta (2004) as the ‘Indian Ocean Interaction Sphere’, when a trans-regional knowledge of the monsoon was evident, open sea voyaging was well established and ports with wharves, warehouses and crafting centres were established; additionally, this period was accompanied by detailed historical records documenting the exchanges and interactions occurring during this period, namely the *Periplus of the Erythraean Sea*, which describes trade

at the start of this period (Casson 1989) and Ptolemy's *Geography*. This section presents an overview of interactions in the Western Indian Ocean, continued links with the Mediterranean, continued South Asian Links with Southeast Asia, the Swahili and the Indian Ocean World, Austronesian Expansion and the Occupation of the Remote Western Islands.

3.5.1. *The Western Indian Ocean*

Several transformative events in the Western Indian Ocean occurred during the first millennium CE. Indian Ocean trade was substantially altered by the rise of the Sassanian Empire in Persia during the early centuries and historical documents highlight a flourishing trade which existed between Iran, Mesopotamia, Eastern Arabia and the Arabian Sea (Whitehouse 2006). The rule of Ardashir I (180–242 CE) promoted state sanctioned trade and merchants from Persia dominated the Gulf during this period, using Sri Lanka as a trans-shipment point to meet traders from China. Another definitive moment in the western region was the rise of Islam in the Hijaz in the early seventh century CE (Pearson 2003). The impact on the Indian Ocean was pronounced in many ways—soon afterwards most populations along the littoral zones and island areas became Islamic, in addition to adherents of the ideology operating large portions of Indian Ocean trade. Therefore ‘the strong cultural and religious ties that had existed between Southeast Asia, India and Ceylon all through the Buddhist and Hindu periods were modified and enlarged when Islamic influence spread eastwards across the Indian Ocean’ (Chaudhuri 1985:38–39).

The Hadramawt area (South Arabia) was also significant during this period, with a continued export of aromatic resins such as frankincense and myrrh to other places in the Indian Ocean (Avanzini and Orazi 2001). Singer (2007) suggests that the height of the aromatics trade was between 200 BCE–200 CE; owing to the Mediterranean demand for the resins. The *Periplus* documents the history of the island of Socotra, an offshore island near the coast of modern Yemen, which was ruled by the kings of the Hadramawt (Casson 1989). Aloe, dragon's blood (*Dracaena cinnibari*), and several species of *Boswellia* are all present on Socotra (Cheung and DeVantier 2006). The island is ill-suited to anchorage, and rather counter-intuitively, ceramics found during survey indicate that it was well-connected to the larger Indian Ocean World, including material dated from the fourth century CE from: Southern Arabia, the Persian/Arabian

Gulf with some also likely from India and the Mediterranean. This assemblage parallels that recovered at the South Arabian mainland site of Qana (Naumkin and Sedov 1993:229–244). Additionally c. 250 drawings have been found in scripts of South Arabian, Indian Brahmi, Ethiopic Ge'ez, Palmyrene Aramaic and Greek written in various methods and mediums onto face of Hoq cave at some stage near the BCE/CE transition, highlighting the cosmopolitanism apparent during this period (Dridi 2002; Seland 2011; Strauch 2012).

As the Socotra example illustrates, material culture parallels support the history of intensive interaction in the region. Major connections established through these material culture proxies in the Western Indian Ocean include links between the Arabian Gulf and Red Sea areas, connections to the Mediterranean (to be discussed in the forthcoming sub-section), in addition to the longer-distance exchanges with South Asia. An example of the first is the recovery of South Arabian basalt ballast from the port sites of Myos Hormos and Berenike, with a likely introduction from Qana and Aden (Peacock 2011). Proxies illustrating the Indian-Arabic-Red Sea connections are well represented. An oft-cited example includes the presence of Indian Red-Polished-Ware (RPW), a fine paste ceramic likely manufactured in Western India during the Early Historic Period, at first century contexts onwards in the Arabian region i.e. Suhar in Oman (Kervan 1996; Schenk 2014). Pepper (*Piper nigrum*) continued to be exported from Southern India, with 7.55 kg recovered at the Red Sea port of Berenike, in addition to Indian textiles, including cottons woven from a Z-spun yarn (Cappers 2006; Wild and Wild 2001). Additionally, further Indian ware finds were recovered inland at Mleiha in the contemporary United Arab Emirates (UAE), a locale connected to an extensive Indian Ocean network (Mouton *et al.* 2008; Reddy 2013). Finds from Ed-Dur in the contemporary UAE offer further evidence and include: glass, ceramics and coins from both funerary and residential first and second century CE contexts (Haerinck 1998; Mouton *et al.* 2008). Additionally, the regionally distinctive Indo-Arab style of stone anchor has also been studied to highlight movement in the area, although limited quantities have been recovered and have not yet been found in dated contexts (Vosmer 1999:250; Tripathi 2005). Further research into the geochemistry of these anchors will assist with solidly confirming a provenance for their manufacture. Evidence for the reverse of this trade is also present, as West Asian glazed pottery has

also been recovered from South Asian contexts including Sassanian pottery at Tissamaharama, Sri Lanka (Schenk 2007; Tomber 2008).

3.5.2 *Links with the Mediterranean*

As previously mentioned, the Roman period in the Indian Ocean begins from the first century BCE and spans through to the seventh century CE, a phase which has been described by Hoogervorst (2013) as a ‘second boost in Indian Ocean trade’. This section does not aim to provide a detailed overview (e.g. Tomber 2008; Reddy 2013); however, intends to present major examples for context. Roman trade with the Indian Ocean was primarily conducted through the Red Sea and Seland (2014:382) remarks that the two ports, Addulis in contemporary Eritrea and Egyptian Berenike provide a ‘fairly robust impression of Roman Period Red Sea and Indian Ocean trade seen from an Egyptian perspective’. Seland (2014) presents examples of the extensive archaeological evidence for these contacts, such as at Addulis, with Mediterranean ceramics, marble and glass recovered during excavation (Blue 2002; Blue 2007; Peacock 2011). Egyptian Berenike, provided further evidence for these connections as buildings exhibited reuse of Mediterranean style ship timbers, which had been constructed of Indian teak in addition to the presence of sails woven in a Mediterranean style (Wild and Wild 2001). Furthermore, ship fittings from the site of Myos Hormos indicate that the vessels of the area were of a style common to that in the Mediterranean (Blue 2007).

Roman finds at Arabian sites include ceramics excavated at Khor Rori (Sumhuram) in contemporary Dhofar, Southern Arabia (Albright 1982). During this period, the site was a well-protected city with a natural harbour, where frankincense was exported (Avanzini 2011). Imported ceramics such as transport amphorae and amphorae carrying *garum* (fish sauce) and wine were also recovered from excavations at Qana (Seland 2014). Qana in present-day Yemen, was an important location for the aromatics trade, and represented a major node in the Egypt-India maritime trade route (Singer 2007). Additionally, Greek and Roman coins have been recovered in the region although the mechanism through which they arrived is unknown (Potts 1994).

However, the most well-known arm of Roman trade is that which has been defined as ‘Indo-Roman’. By the writing of the *Periplus* in the first century CE direct exchange

between Roman Egypt, India and Sri Lanka was established (Casson 1989). Nonetheless, the agents responsible for such exchanges cannot be discerned from the archaeology alone—a scenario may have existed which involved the Aksumites or Southern Arabians acting as ‘non-Roman middle-men’ (Sidebotham 2002:230). Tomber (2008) has conducted the most extensive research on Roman material in India and states that this period of contact generally falls into the Early Historic period of South Asia. In Southern India this period marks the transition from the megalithic to urbanized societies and closes by 500 CE (Champakalakshmi 1996); whereas, in Northern India it terminated earlier c. 300–500 CE during the Gupta Empire (Selvakumar and Darshana 2008). Roman material culture has also been recovered from contexts into the early medieval phase c. 500–600 CE. Examples of Roman finds from South Asian archaeological contexts during this period are plentiful and include: ceramics, coins, glass and beads (Seland 2014). Evidence of commercial contacts with the Red Sea has been recorded from 36 sites from the coasts of Gujarat, Maharashtra, South India, Sri Lanka and Andhra Pradesh in the form of Roman and late Roman amphorae and Mesopotamian torpedo jars (Tomber 2007). Additionally, early interpretations of the material at Arikamedu suggested that rouletted ware was inspired by Roman designs, although recent investigations indicate it is more locally construed (Begley 1988; Magee 2010; Ray 1994). Investigations in Sri Lanka also evidence Indo-Roman exchanges, with finds of late Roman bronze and copper coins and ceramics found at Mantai and Anuradhapura (Begley and De Puma 1991; Coningham 2002; Magee 2010).

3.5.3. Continued South Asian links with Southeast Asia

During this phase longer-distance exchange connected South Asia with the Far East via two possible routes: one overland across the Isthmus of Kra in Southern Thailand or another across the straights of Melaka (Pearson 2003). Pearson (2003) comments that the land route was preferred to the sea route throughout the first century CE until two centuries later when the development of larger ships made the sea route more economical. Gupta (2005:27) argues for a process of reciprocal exchange across the Bay of Bengal rather than a process ‘set in motion by Indian trading groups around the mid-1st millennium AD’. These connections between South Asia and Southeast Asia have been the subject of considerable scrutiny and debate (Manguin 2013:xvi); and as detailed here and in the previous section far less secure evidence for exchange

in a westwards direction has been found. Bellina (2004) comments that it was the elite groups in Southeast Asia (except some areas in mainland Southeast Asia, Eastern Indonesia and the Philippines) who adopted Hindu and Buddhist practice, political ideologies and ‘ritual languages’. Pearson (2003) supports this and writes that Buddhism and Hinduism were adopted within Southeast Asian contexts as a direct incentive to adopt South Indian ideas of kingship and ritual and they were not ‘passive recipients of a higher culture’.

Buddhist pilgrims travelled from east-to-west and then returned, with many of these exchanges documented in Fa Hsien’s travelogues. Buddhist nuns from Sri Lanka travelled to China by sea c. 420 CE and Chinese traders were present in Sri Lanka (Pearson 2003). Additionally, throughout this period India maintained political plurality with three major entities present in the north including: the Mauryas, Kushanas and Guptas. The Satavahannas were present in the Deccan and the Cheras, Cholas and the Pandyas in South India (Bellina 2004:72).

Another turning point was the rise of the thallasocracy of Srivijaya which regionally controlled ISEA from the sixth to the eleventh century CE. This consolidated the ‘diffuse trade’ of several competing ISEA centres and was succeeded by the rise of Majapahit in the second millennium CE. Srivijaya was situated in contemporary Sumatra and records of the maritime state can be found in Chinese texts (Junker 1999). This was an important locale for the movement of material across the Indian Ocean in the first millennium CE period (Pearson 2003).

Alongside these historically documented occurrences several reliable archaeological correlates have been recovered from Southeast Asian contexts which support an intensification of these trade networks during the first millennium CE (Ardika and Bellwood 1991). Arikamedu Pottery continued to be exported to ISEA (Ardika *et al.* 1994; Manguin and Indradjaya 2011; Calo *et al.* 2015). Spindle whorls containing traces of iron spindles were recovered from the Thai site of Thae Kae in contexts dated earlier than the previously thought Dvaravati period (sixth to thirteenth century CE), indicating connections with India (Cameron 2011). A proliferation of Indo-Pacific beads throughout the Indian Ocean was witnessed. Indo-Pacific beads were originally produced at Arikamedu (Pondicherry) in the first few centuries prior to the BCE/CE

transition; with a use range from third century BCE to the fourteenth century CE (Katsuhiko and Gupta 2000). A notable increase in their presence was witnessed in Southeast Asia during the first millennium CE, which has often been attributed to increasing trade and the formation of local secondary production centres in Southeast Asia (Katsuhiko and Gupta 2000). Additionally, as previously mentioned carnelian objects have also been studied to better understand this exchange (Theunissen *et al.* 2000). The presence of these traded materials has been said to represent a ‘vast network of trade stretching from the Mediterranean basin and the Red Sea to South China’ (Glover and Bellina 2011).

3.5.4 The Swahili and the Indian Ocean World

The Swahili have inhabited the East African coast as a mercantile society controlling trade with the Indian Ocean and interior Africa since approximately the seventh century CE (Kusimba 1999; Horton and Middleton 2001; LaViolette 2004). Swahili society can be defined as Islamic and speaking varied dialects of Kiswahili, a language which shares commonalities with the Mijikenda and Pokomo languages of the immediate coastal hinterland (Horton and Middleton 2001). East Africa’s pre-Swahili connection to the Indian Ocean World has been hinted at in the *Periplus* (Casson 1989); however, very little information concerning the region’s coastal and maritime connections is known prior to the establishment of the urbanized Swahili coast sites (Boivin *et al.* 2013). Additionally, assemblages from the earlier period remain largely unanalyzed hindering interpretations.

Commerce was the driving force behind Swahili traders who acted as middle-men exchanging raw materials (i.e. ivory and gold) between the Indian Ocean World and the African interior. The apogee of the Swahili was the sixteenth century when they occupied a region from Somalia (Mogadishu) to southern Mozambique and the offshore islands of Zanzibar, Pemba, Mafia, the Comoros and Madagascar (Horton and Middleton 2001). Horton and Middleton (2001) suggest that the Swahili represent a ‘specialist coastal adaptation’ to widespread farming practices. The presence of Islamic architecture in East Africa at a later date than the attendant ceramics also confused initial interpretations. This can be explained by more recent scholarship which rejects previously held ideas suggesting the substantial input by Arabian and Persian colonists into the formation of the Swahili culture, as recent studies into the

ceramic sequences from major Swahili sites including: Shanga, Manda, Kilwa, Kisimani Mafia and Ungwana, parallel those of the coastal hinterland, a linguistic area which shares commonalities with Swahili (Boivin *et al.* 2013).

3.5.5 Austronesian Expansion

The seminal linguistic work by Dahl (1951) established links between Malagasy, the language of Madagascar, and Maanjan a Southeast Barito language of Kalimantan in Borneo, which stimulated research into a western Austronesian migration. Studies into the movement of Austronesian speaking people between Southeast Asia and East Africa during the first millennium CE have focused on evidence recovered in Madagascar and the Comoros (Dahl 1951; Adelaar 1989; Dewar and Wright 1993). The timing of these contacts has been contentious, for example the previously mentioned banana phytolith research has suggested a first millennium BCE transfer, although some have argued that this relates to visitation as opposed to colonization, which occurred in the later first millennium CE (Beaujard 2011). Madagascar is located east of Africa and the Comoros island group consists of four major islands, these include Ngazida, Mwali, Ndzuwani and Maore (Mayotte). Wright (1984) proposed that the Comoros acted as a trans-shipment locality between Madagascar and East Africa. No historical records of early migration exist (Boivin *et al.* 2013), although oral histories include references to people travelling from South Asian and Southeast Asian contexts (Ingrams 1967; Walsh 2010) and there is the fourteenth century historical account by the Arab historian Ibn al-Wardi describing the Waqwaq islands—otherwise known as Sumatra (Mauny 1965).

Blench (2010) hypothesized a timeline for culture-contact between the two regions. He suggested that there were Austronesian interactions with East Africa slightly prior to the BCE/CE transition and not related to the settlement of Madagascar. He argued that these were direct voyages utilizing the outrigger, bringing spices and taking back Mediterranean commodities along the Equatorial Counter-Current. This argument is reasonably countered by Manguin (2011) who proposes that Southeast Asian traders would have needed larger vessels, as opposed to outrigger canoes, owing to the distances travelled. Moreover, no Southeast Asian material culture appears in the East African archaeological record, which seems unlikely, if these return voyages incorporating trade were undertaken. Blench's (2010:246) proposed timeline closes

with a later Malay speaking group instigating voyages, resulting in the transport of Barito- and Sabaki- speaking people from Borneo to Madagascar, with a ‘trading and raiding culture’ existing from between the sixth and twelfth centuries. Blench’s evidence for this hypothesis is associated with cultural diffusion, such as the presence of the stick zither and leaf-funnel clarinet in Madagascar, which he suggests would likely be a Southeast Asian introduction (Blench 2006). Blench (2010) also argues that the ‘Zenj’ or East Africans, moved the xylophone from East Africa to Asia. However, this concept of a ‘trading and raiding culture’ remains somewhat unresolved owing to a lack of definitive evidence (such as material culture).

Another line of evidence presented to suggest Austronesian movement, refers to the presence of elephantiasis in East Africa, which was thought to be transmitted from Southeast Asia (Laurence 1968). It is a disease transmitted by mosquitoes infected with parasitic worms, resulting in the enlargement of the skin and underlying tissue; however, this is unlikely and as Hoogervorst (2013) counters it was also present in Egypt in the late third millennium BCE, which confuses the point of introduction. Moreover, as Hoogervorst (2013) highlights, additional research indicates that elephantiasis can only be spread through large numbers of infected humans, which would suggest a transmission via a small group of Southeast Asian mariners less plausible (Dean *et al.* 2011).

Ethnographic evidence has also been used to infer potential connections, for example the contemporary diet of the Dembeni population (Comoros) also correlates to Indian Ocean participation—subsisting on rice, possibly indicating Southeast Asian cultural input. Additionally, Allibert (2008) presented Malagasy cultural affiliations with Southeast Asia such as: the role of the maternal uncle in rites of passage, secondary and canoe burials and the significance of the number eight to the concept of death. Hoogervorst (2013) also discusses a turtle catching method, involving a sucking-fish or remora (*Echeneidae* sp.) that is present in both East Africa, parts of the Pacific and the Torres Strait (Hornell 1950). The Malagasy term for this appears to be related to the Malayo-Polynesian (Blust 2002); however, other East African terms for the practice are Indigenous. Hoogervorst (2013) also suggests that the bat-eating witnessed on Pemba, which is also practiced in the Comoros, Madagascar and Island Southeast Asia, represents another Southeast Asian introduction, as it is taboo in

neighbouring East African communities (Walsh 2007). Nonetheless, this may be coincidental.

Material culture evidence has also been used to attest to this movement, although definitively ‘Austronesian’ material from East Africa is lacking (Boivin *et al.* 2013). As pointed out by Boivin *et al.* (2013), Chinese Dusun ware is present in East African archaeological contexts from the late eighth to ninth century CE, although this material has also been recovered in Gulf sites, which highlights a potential northern introduction (Wilson and Omar 1997). Moreover, as with Indo-Roman trade, it is likely that middlemen or other traders were also responsible for its dispersal and therefore its use as a proxy is limited. Shell impressed pottery was also found on the East African coast and in Madagascar and this has been loosely and unconvincingly linked to Southeast Asian design influences (Allibert 2008:10). Pottery recovered from the Comoros also included a shell impressed type which Wright (1984) linked to similar types in Madagascar. Most ceramics from Dembeni phase sites in the Comoros were imported from the Gulf region, which included Sasanian-Islamic wares (Wright 1984; Allibert 2008). Other locally produced pottery in Madagascar was similar in type to that of Chibuene and Manda in northern Kenya.

Convincing evidence for Austronesian movement relates to the genetic evidence from Madagascar, based on Y-chromosomal and mitochondrial genetic variation, which has confirmed the partly Southeast Asian origins of the population (Hules *et al.* 2005). Genetic research on the Comorian population suggests a ‘genetic mosaic’, related to the ‘tripartite gene flow from Africa, the Middle East and Southeast Asia’ (Msaidie *et al.* 2011).

The human-mediated movement of particular plants also supports the case for westerly Austronesian migration. One includes a recent study into coconut genetics, which indicates an admixture between Pacific and Indo-Atlantic types in the Western Indian Ocean (Gunn *et al.* 2011). Because of the predominance of admixture in the Western Indian Ocean, ‘it is likely that humans played a prominent role in the establishment and propagation of coconuts in that region’. Three current African tubers have origins in ISEA, including taro (*Colocasia esculenta*) and yam (*Dioscorea alata* and *Dioscorea esculenta*) (Murdock 1959). Hoogervorst (2013) examines the linguistics

associated with these crop movements with several East African languages (although not all) incorporating Southeast Asian acquisitions into their lexical corpus. Recently, Crowther *et al.* (2016:6637–6638) presented new archaeobotanical findings, suggesting ‘the overwhelming dominance of Asian crops in the earliest records of the Comoros and Madagascar is consistent with patterns observed when crops move through human colonization’.

However, the most convincing evidence for the movement of Austronesians, aside from the genetic, recent archaeobotanical and linguistic information, is the wayfaring potential established by modeller Callaghan and archaeologist Fitzpatrick, which lends credibility to the plausibility of this migration (Fitzpatrick and Callaghan 2008). The results indicate that the Maldives, and to a lesser degree Chagos, would have been important waypoints through the Indian Ocean voyage when models were applied to Sumatra or Sri Lanka/India.

3.5.6 The Remote Western Islands: The Seychelles and the Mascarenes

Here the Seychelles and Mascarene island groups are reviewed: both are positioned east of Madagascar. East African near-shore islands such as Pemba, Zanzibar and Mafia Island are included in the Swahili review section whilst Madagascar and the Comoros were considered in the previous section ‘Austronesian Expansion’. These western islands are often under-reported on in both the historical record and archaeological syntheses of the western Indian Ocean, likely owing to their later colonization dates and a dearth of archaeological research.

Archaeology in the Seychelles has been limited to the recovery of a mid-sixteenth century Portuguese shipwreck off the coast (Blake and Green 1986), and preliminary investigations undertaken by Atholl Anderson, Geoffrey Clark and Simon Haberle in 2010 (Geoff Clark pers. comm. 2010). Most cultural information is derived from the historical record, which suggests an initial settlement by the French in 1770, with a population of Europeans, Indians and Africans. British occupation succeeded French occupation in 1813, until it was declared a republic later in 1976.

The Mascarenes consist of Rodrigues, Mauritius and Réunion. Alongside the Seychelles, this island group was occupied later than other islands in the Indian Ocean,

with most colonized during the late second millennium CE. Previous visitations by Arab traders were recorded by Al Idrisi, an Islamic geographer. Mauritius has been the subject of the most archaeological research; despite this, the historical record has provided the main narrative with archaeology ‘lagging behind’ (cf. Seetah 2010; Seetah *et al.* 2011; Appleby *et al.* 2012; Teelock 2012). A cemetery in Le Morne dating to 1830 was examined, which contained the burials of freed slaves or ‘freed Madagascans’ in addition to investigations of barracks dating to the latter half of the nineteenth century (Albright 1982; Appelby *et al.* 2012; Calaon *et al.* 2012). Further archaeozoological work involved the recovery of Dodo remains (Hume *et al.* 2014). Réunion has not been the subject of archaeological research, although Arab sources suggest potential early, first millennium CE knowledge of the islands, in addition to potential Swahili or Malay visitations. French colonization occurred in 1655 by the French East India Company. In the later seventeenth to nineteenth century, the migration of Africans, Chinese and Indians supplemented French immigration (Littrell 2012). Similarly, Rodrigues Island has received no attention by archaeologists. It was first colonized from 1691 by a group of protestant refugees. The eighteenth century saw French occupation resulting in African slaves being brought over from mainland Africa and British troops took possession in 1809.

3.6 Conclusion and Summary

The aim of this chapter was to present a timeline of major interactions in the Indian Ocean and the associated evidence, in order to contextualize this research, and to also identify major phases of change in the larger region. What is apparent, is that most of the evidence for interaction is based on material culture, which is attributed to particular types, or classes, based on style. Although chemical characterization of carnelian and glass has been conducted, this has not commonly been the case with ceramics. Further geochemical provenancing will assist with firming up these arguments. Until recently (e.g. Fuller *et al.* 2011; Crowther *et al.* 2016), evidence concerning human mediated crop and animal introductions has not always been based on aDNA studies or rigorous archaeozoological and archaeobotanical studies, but on ethnographic and linguistic estimations. Chronologies have also often been founded on contextual and an uncritical use of radiocarbon dates.

In summary, early examples of exchange in the region includes the movement of Ubaid pottery as far back as the sixth millennium BCE (Boivin and Fuller 2009). Other well-known early examples include the trade in frankincense (*Boswellia sacra*) and myrrh (*Commiphora* sp.) from the incense region of Southern Arabia and the movement of pepper from South India to Egypt c. 1200 BCE (Plu 1985). By the first millennium BCE deep sea voyaging was underway which was facilitated by knowledge of the monsoon. During this period, Indian material culture was traded into MSEA and ISEA (Glover *et al.* 1996; Manguin and Indradaja 2011; Manguin *et al.* 2011; Calo *et al.* 2015). The time of ‘flourishing exchange’ occurred in the following period—the first millennium CE, where cosmopolitanism was ‘rendered ordinary for the wider ocean and not just India and the proximal areas ... and specialized merchants and travellers appear on the scene’ (Walz and Gupta 2011). The toponymy highlights this as the English name for the region is linked to the Arabic phrase for the ‘Indian waters’—*al bahr al Hindi* (Pearson 2003:14). Trade and movement was widespread as was the transfer of Buddhism and Hinduism into Southeast Asia, which was subsequently followed by the dispersal of Islam across the Indian Ocean after the eighth century CE (Ray 2003). Evidence for Austronesian movement across the Indian Ocean from Southeast Asia to East Africa has been found mainly in first millennium CE contexts (Adelaar 1989; Dewar and Wright 1993; Beaujard 2005; Hoogervorst 2013). The Swahili mercantile centres of the East African coastline traded into the larger Indian Ocean World in the later part of the first millennium CE (Horton and Middleton 2009). Later colonization of the Seychelles and the Mascarenes occurred in the recent part of the last millennium. The archaeology of these island groups is extremely sparse; but produces an archaeo-historical record of slavery in the region (Seetah 2010; Seetah *et al.* 2011; Appelby *et al.* 2012). Further investigations in the Western Indian Ocean will clarify the early occupation histories of the island groups. All of these regional events contextualize Maldivian engagements with the Indian Ocean World, which will be presented in the next chapter.

4

The Research Setting: The Maldives

4.1 Introduction

The previous chapter outlined phases of interaction in the Indian Ocean that contextualize this research. This chapter introduces the research setting by establishing the physical setting, which includes: the geology, relevant sea-level history, climate and vegetation of the Maldives. The cultural context follows, which is based on major ethnographic works concerning the *Divehi* population. Here the generally accepted Maldivian culture-history timeline, language, local resource exploitation, craft production, systems of kinship and socio-political development are discussed. The archaeological and historical background follows, which includes a review of major research. This section begins with a history of archaeology in the Maldives, followed by more focused thematic discussions, the first discusses initial colonization; the second outlines the relationship between the Maldives and the larger Indian Ocean World. A subsequent section on major world religions in the Maldives reviews the evidence for and timing of Hinduism, Buddhism and Islam in the archipelago. The potential for Austronesian contact occurring in the archipelago is presented, before an overview of maritime technologies and early subsistence strategies closes the chapter.

4.2 The Maldives: The Landscape and Location

The Maldives are located in the centre of the Northern Indian Ocean, south-west of India and Sri Lanka; see Figs 1.1 and 4.1 (Lüdmann *et al.* 2013:237). The island chain is an isolated carbonate platform, located midway on the Chagos-Laccadives Ridge, and consists of a double row of atolls extending from Addu (Seenu) Atoll in the south to Ihavandhippolhu (Haa) Atoll in the north, from 0°34' S to 6°57' N (Risk and Sluka 2000:328; Naseer and Hatcher 2004). The Maldives were formed on the Chagos-

Laccadives submarine ridge, and are ~850 km long and ~125 km wide, constituting the largest chain of atolls in the world (Kench *et al.* 2009; Lüdmann *et al.* 2013:327). The archipelago consists of over 1,200 individual mid-to-late Holocene reef islands, with ~20 atolls (Woodroffe 2005:127; Kench and Brander 2006:4). The coral islands have extremely low elevations and surface areas, with an average ground surface elevation of 1.4 m and the average surface area of many inhabited islands being less than 1 km² (Bailey *et al.* 2014).

The long-term geologic history of the Maldives has been reconstructed from seismic data and industrial wells (Aubert and Droxler 1992; Purdy and Bertram 1993). The atolls are situated on up to 3km of limestone, on a 55–57myr old subsiding volcanic plateau, which was dissected during the early Eocene (Kench *et al.* 2009; Betzler *et al.* 2013). The Inner Sea formed during the Miocene and was enclosed by two north to south facing atolls, lined by reef margins facing the Indian Ocean. In the middle Miocene partial drowning separated the atolls by forming passages (Betzler *et al.* 2013). During the Holocene, sea-level rise resulted in a newer physiography, involving shallow reef accumulation on top of the older Pleistocene karst horizon (Risk and Sluka 2000:237). Risk and Sluka (2000:328) remark that there is considerable physical variation between the northern and southern atolls; in the north there are broader banks, smaller peripheral islands and large numbers of farus (ring reefs). In the south, the lagoons are deeper, farus are not as numerous and in some instances absent, and the atoll rim is more cemented.

The Holocene sea-level history of the Maldives has been the subject of debate throughout the last century (Woodroffe 2005; Gischler *et al.* 2008). Gardiner (1904) was the first to engage in these discussions and did so with remarkable ‘prescience’ by hypothesizing a high stand at approximately 4000 years BP, owing to the presence of fossils in conglomerate rocks (Woodroffe 2005). Gardiner’s hypothesis was later dismissed by other researchers and these deposits were said to be associated with storm action (Curry *et al.* 1970).

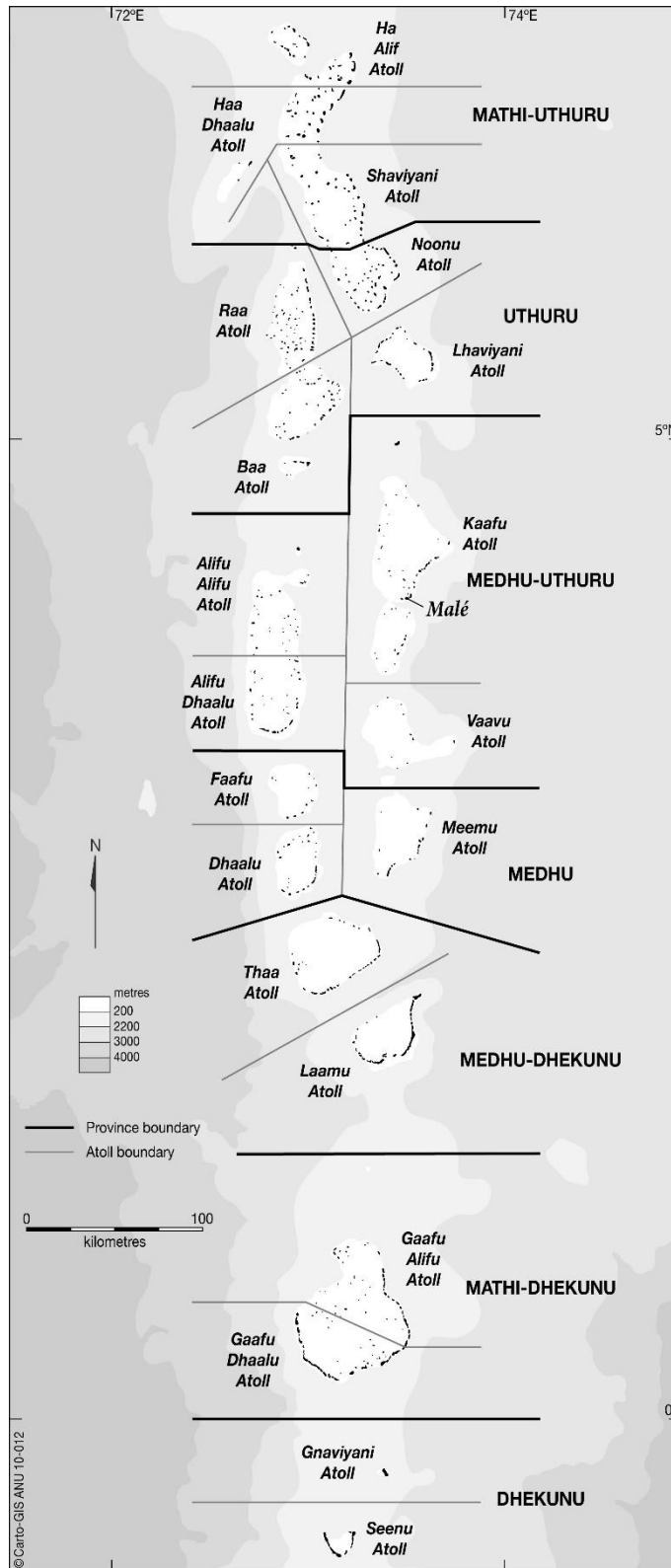


Figure 4.1 The Maldives

Credit: CartoGIS, Australian National University

Mörner *et al.* (2004) suggested a high stand in the Holocene between 1–1.2m above present at 3,900 years BP, although this has been contended owing to the material dated and poor elevation control (Kench *et al.* 2005). Gischler *et al.* (2008) found no clear indication of a higher than present sea-level in their studies in the central Maldives. Recent investigations by Kench *et al.* (2009:445) indicate a late Holocene high stand between 4–2,000 years BP, with a sea-level increase of +0.50m (+/- 0.1m) above present levels. These results fill a gap in regional patterns of sea level change, by confirming that the central region agrees with island records in the Eastern Indian Ocean, and not the Western.

The climate of the Maldives is defined by the two monsoon periods, characterized by reversals in wind direction (Kench and Brander 2006). The Maldives experience the south-west monsoon (wet season) from April to November (with a mean wind speed of 5.0m/s); the north-east monsoon (dry season) persists from November to March with a mean wind speed of 4.8m/s (Department of Meteorology 1995). Humidity is high and the temperature varies little, ranging between 24°C and 30°C. Historically, the relatively thin freshwater lens, which is affected by seasonal changes in rainfall patterns, was the source of potable water for Maldivians (Bailey *et al.* 2014).

The modern vegetation is typical of Indo-Pacific coral island flora; the plants have no significant endemism, and most are pantropical in distribution, with inputs from Sri Lanka (44%), Africa (28%) and Malaysia (25%) (Rao and Ellis 1995). On islands lacking humus soil only salt and drought resistant bushes and *Cyperaceae* species persist (Maloney 2013). This meant poor opportunities for the development of traditional crops and agriculture found elsewhere in the Indian Ocean and ISEA. Additionally, very little of the native ecosystem has been retained and most has been replaced by coconut plantations and other crops with scattered evidence for the original vegetation present on some islands (Saldanha 1989). For example, *Pisonia grandis* ('*Ilhos* in Divehi) is almost extinct (Romero-Frías pers. comm. September 2015). However, Chagos is less disturbed than both the Lakshadweep and the Maldives (UNEP 1998).

4.3 The *Divehi*: The Cultural Context

The ethnic group inhabiting the Maldives are the *Divehi*, which locally means ‘islander’. The language is also known as *Divehi* and the country is known as Divehi Rajje meaning ‘Island Kingdom’ (Maloney 2013:1). The culture has been described as somewhat ‘homogeneous’, by Munch-Petersen (1982), which he attributes to the adherence to a single religion and the widespread use of a single language. The current title the ‘Maldives’ is derived from *Male’ dvīpa*, or the ‘islands under the rule of Male’ (Romero-Frías 1999).

The contemporary population adheres to Islam; however, prior to the introduction of Islam in 1153, a Buddhist tradition was present. Table 4.1 outlines the generally accepted culture-history of the Maldives. This is conventionally partitioned into either the early pre-Islamic or Buddhist phase and the Islamic period post-1153, with some mention of other various occupations post-1500 (Maloney 2013). This culture-history is not always adhered to by contemporary Maldivian scholars, as there is some reticence to acknowledge a Buddhist period prior to the introduction of Islam. This has manifested problems across social science disciplines, particularly anthropological works and studies of early period material culture (Proctor 2013; Romero-Frías 2015). Many Buddhist material culture items have been destroyed before appropriate recovery and protection (Forbes 1984); however, the most deleterious outcome was the recent complete destruction of the early period collections at the National Museum in Male’ in 2012, with virtually all sculptures being destroyed by an opportunistic extremist group (Bajaj 2012:A4; Proctor 2013).

Table 4.1 Timeline of Divehi culture-history (After Bell 1940; Forbes 1987; Mohamed 2005b; Ragupathy 1994; Romero-Frías 1999; Maloney 2013)

Date	Culture-History
1600s–1965	Dutch protectorate and later British protectorate until 1965 when considered a sultanate outside the Commonwealth
1558–1573	Portuguese occupation
1153–current	Islam introduced
Pre-1153	Buddhist occupation
Unknown	?Hinduism present
First millennium CE	Austronesian contacts

The Maldives have been the subject of a handful of anthropological and linguistic works, which have documented contemporary and historical observations of Maldivian culture, including that by Munch-Petersen (1982), Maloney in 1980, with a recent second edition (2013). Romero-Frías (1999) produced the most extensive anthropological work on the islanders in *The Maldivian Islanders: A study of the popular culture of an ancient ocean kingdom*, and more recently *Folk Tales of the Maldives* (2012). Vitharana (1997) discussed the *Maldivian-Sri Lankan Cultural Affinities*. Colton (1995) also described the elite of the Maldives. These studies document several major topics, some of which are briefly outlined below, including: system of kinship, governance, language, resource use and craft production and contemporary demography.

4.3.1 System of Kinship

Several observations about Maldivian kinship have been presented in different anthropological works and some are presented here. According to Maloney (2013) the Maldivian system derives from Dravidian (South, Central and Eastern India), Northern Indian and Arab systems. He suggests that Dravidian systems of kinship suggest that cross-cousins (children of a sister and a brother) may marry, whereas parallel-cousins (children of a brother and a brother) may not, and this is considered incestuous in the Northern Indian system, which according to Maloney (2013) prefers exogamy. He also highlights that Arab systems do not consider parallel-cousin and cross-cousin marriage incestuous, which is consistent with the Maldivian system. Maloney (2013) suggested the Maldives were once matrilineal, although it is now patriarchal, which is similar to Arab and Northern Indian systems. However, Munch-Petersen (1982) notes a bilateral kinship system—involving equal interaction with both maternal and paternal kin—and one that is also ambilocal (Romero-Frías 2015). Munch-Petersen (1982) also observed a system of open marriage (and a high degree of sexual independence).

4.3.2 Governance

The establishment of the Maldivian State was a consequence of Arab trade in the middle to late first millennium CE (800–900 CE) (Munch-Petersen 1982). Political centralization was fast—trade was centralized, alongside trade profits, market information and political control, resulting in a Maldivian trade economy. Little is

known of the ruling lineage during the Buddhist period; however, the first King after conversion was known as the Sultan. In Male' political hierarchy was formed with a Sultan, sometimes a Sultana, as head of state and the monarch was the main trader. There have been 93 Sultans from 1153 through to 1968 when presidency was adopted during the Second Republic in 1968 (Maloney 2013:188).

All land belongs to the State (Munch-Petersen 1982:92). Maloney (2013) argues that three major levels of governance have persisted: the island (village), atoll (district) and the national government. He highlights that the individual is integrated into the political system at island (*ra*) level. Separate administrative districts exist, which are known as *madulu*, this name derives from the Sanskrit *mandala* (Romero-Frías 1999). For administrative reasons the atoll chain is broken up into both geographic and administrative divisions ranging from north-to-south. Maloney (2013) suggests that island and atoll chiefs were traditionally ecclesiastical positions, and subsequently became secular positions. State-imposed punishment involves a system of exile or banishment. Individuals were deported to an 'uninhabited island' which was adopted as a more humane approach to imprisonment (Maloney 2013). Maloney attributes this to a Sinhalese tradition, but further suggests the practice was also employed to take advantage of the physical limits provided by unoccupied islands.

4.3.3 Language

The Maldivian language is known as *Divehi* and linguistic studies have examined the potential origin of this language. De Silva (2009) argued for a simultaneous separation of Sinhalese and Maldivian from a Prakrit language, which was supported by events detailed in the *Mahavmsa* and Dravidian influences apparent in place names in the Maldives. Although many dialects exist, it is clear that *Divehi* is of Indo-Aryan origin and contains other older Indic elements. Geiger (1996) initially compared Maldivian or *Divehi* (of the northern atoll's *mahl* dialect) to Sinhalese and he concluded that Maldivian emerged from Sinhalese no earlier than the tenth century (cf. Vitharana 1997; Reynolds 2003).

4.3.4 Resource Use and Craft Production

Maritime trade was and is essential to the *Divehi*, as Maldivians are highly reliant on a limited set of natural resources (Romero-Frías 1999). Munch-Petersen (1982)

elaborated on the importance of marine resource use in the Maldives, in that not only was cowry (*Monetaria moneta*) exploited extensively, but a variety of other shells served various functions: *Nautilus* sp. was used to produce spoons, conch shells (*Strombus* sp.) as trumpets to signal sunset during fasting periods and tiger cowries (*Cypraea tigris*) as counterweights. The skin of sharks and rays were used as drumskins on the local *Bodu beru* drums and for sanding the Maldivian *dhoni* during construction (Munch-Petersen 1982:90). Ethnographic collections housed at the British Museum support this extensive use of marine resources, with examples of shell used to make ornaments and tools. Additionally, the widespread use of coral-stone as a construction material throughout the islands has considerable time-depth as a practice (see Chapter Eight for further detail). Extra to marine resources, the coconut tree is of extreme importance. It has been categorized separately as *divehi ru'* (coconut palms), whereas all other plants are classified as *gae hae* (plants), highlighting the significance to Maldivians: the palm juice, fruit and sugar are consumed, leaves are used for roofing, the coconut bast for coir rope and twine, the shells are fashioned into containers and the timber for boat construction and housing materials (Romero-Frías 1999; Maloney 2013).

Craft production is generally practiced to supplement primary income and Munch-Petersen (1982) remarked that in previous periods each island had a stonemason and carving was a highly developed craft—the extensive stonemasonry throughout the islands attests this. Stonemasonry has declined in more recent times with Munch-Petersen (1982) reporting that there were only two men on Firubadu Island who continued the tradition in 1980. Cotton weaving is traditionally a male craft and reed weaving a female craft. Moreover, there are carpenters on most islands and smiths on larger ones and individual islands often developed specialized craft traditions (Munch-Petersen 1982), for example the islands of Ribudu and Hulhudeli specialize in gold and silver smithing, Gaddu Island concentrates on grafting patterned sedge mats and Tuladu Island specializes in lacquerware (Ottovar and Munch-Petersen 1980).

4.3.5 Contemporary Demography

The contemporary demography of the Maldives involves a population exceeding 317,932 (Shaljan 2004), with a large proportion of the total living in the capital Male' (n=74,069). Almost one-half of the population of the Maldives lives in high density

conditions, for example Male' has a population density of 325 persons per ha², and others such as North Maalhosmadulu Atoll (Raa Atoll) has a concentration of 629 persons per ha². Large quantities of the inhabitants of Male' have migrated from other islands and the current population distribution throughout the archipelago tends to be concentrated on the larger islands near good fishing waters or channels. In the 1970s only 204 of the islands were inhabited and it appears that the settlement pattern was determined by island size and ecological constraints.

The Maldives currently faces several challenges, owing to the small amounts of available land, the wide dispersal of the population and a dearth of land-based resources, both of economic and subsistence value. The Maldives contain no rivers or freshwater bodies, except two large freshwater lakes on Fuvahmulah Atoll (Gnaviyani Atoll), and limited arable land as the local soils are hypercalcic and exclude use for all but basic agricultural products. All of these factors 'translate directly into severe diseconomies of scale in production, transport and the provision of essential infrastructure and services' (Shaljan 2004). Despite this, the Maldives has performed well economically through the growth of the marine resource and tourism industries, although this narrow economic base promotes vulnerability, which is furthered by a reliance on imports.

4.4 A History of Maldivian Archaeology

The mid-1800s marked the beginnings of Maldivian archaeology. These early investigations were consistent with the style of archaeology present throughout the Indian Ocean, which involved episodes of antiquarianism and were micro-regional in approach (Seland 2014). The Maldivian research emphasized the recovery and identification of potential Buddhist monuments and other associated 'markers' of the early period. In 1836, the Indian Navy's Lieutenants Young and Christopher presented a case for a prior Buddhist period. This involved several observations including: a Sri Lankan Buddhist priest's acknowledgement of extant religious monuments in the Maldives and also the presence of a large Bodhi tree (*Ficus religiosa*) in Male' (Bell 1940:140). Bodhi trees were often considered sacred and found in close proximity to Buddhist monasteries. In the mid-1800s, structures which had been intentionally covered at the arrival of Islam were excavated in order to further substantiate these claims. The first of these investigations was conducted by local Maldivians in 1848

on Landhoo Island in Southern Miladhunmadulhu Atoll (Noonu Atoll) and involved the excavation of an earth-covered *havitha* (the term for the remains of a stupa in the Southern Maldives) known as ‘Maabadhige Haiy Haitha’ (or the alternative name ‘Hatka’). It was subsequently visited by John Stanley Gardiner, a Professor of Zoology at Cambridge, in 1900 during a much larger survey and by Ceylon Civil Service commissioner Harry Charles Purvis Bell (HCP Bell) later in 1922 (Waheed 2003:43). The artefacts recovered from the *havitha* included an unknown number of copper and/or gold discs, which were retrieved from the coral-stone reliquary (a container housing Buddhist relics found within a stupa); however, the coins were destroyed immediately post-excavation (Forbes 1987:282).

Research gained momentum in the latter half of the 1800s with the further discovery of Buddhist monuments and an interest in toponymic research into place names associated with Buddhist traditions. The major works included that of antiquarian C.W Rosset in 1886 (Rosset 1886), Stanley Gardiner in 1900 (Gardiner 1904) and HCP Bell in 1879, 1920 and 1922 (Bell 1940). It was Gardiner’s more extensive research which documented several covered Buddhist monuments in the southern atolls and several structures reminiscent of stupas at the significant Buddhist site of Anuradhapura in Sri Lanka, which motivated a more substantial phase of research in the 1920s. However, despite Gardiner’s cynicism over the merits of his own research, it was well received by others, with Bell (1940:110) commenting that Gardiner’s contribution ‘[built] better than he knew’.

Bell’s archaeological research in the Maldives was completed in 1879, 1920 and 1922 and it aimed to consolidate and confirm previous observations. Bell visited the island chain twice when he produced two seminal volumes on the archipelago: *The Maldiv Islands: An Account of the Physical Features, History, Inhabitants, Productions and Trade* (1940) and *The Maldiv Islands: Monograph on the History, Archaeology, and Epigraphy* (1940). These presented Bell’s investigations, including surveys of Buddhist sites in the south, which involved his survey of a small *vihara* (a Buddhist monastery site) on Gan Island in the southernmost atoll, Addu (Seenu) Atoll and a ruined stupa on Fuvahmulah in Gnaviyani Atoll. Furthermore, he investigated a stupa locally known as ‘Budu-ge’ on Mundoo Island in Haddhunmathi Atoll, as well as a larger Buddhist monastery complex on Gan Island, which had been previously

identified by Stanley Gardiner in 1900 (Forbes 1987:283). The *Dhambidu Lōamaḥānu*, *Isdu Lōamaḥānu* and *Gamu Lōamaḥānu*, an early Maldivian set of inscriptions composed at the transition to Islam in the twelfth century, described the destruction of the Gan temple compound. They document the beheading of Buddhist monks at the site, the destruction of coral-stone statues and the burning of scriptures of pandanus leaves (Romero-Frías 1999:27). The excavation on Gan in Haddhunmathi supported the documentary account of the site being a major centre of Buddhism. Bell (1940) also noted parallels between the Gan structures and other Buddhist monument types in Sri Lanka (Bell 1940).

Four archaeological investigations were undertaken during the 1940–1950s. These were all conducted by local Maldivians, the first by Adam Nasir Maniku and the final three by Muhammad Ismail Didi and all involved the excavation of *havitha* and *gafuuni* (northern term for the remains of a stupa) structures. The first excavation was undertaken in 1948 on Fuvahmulah Island (Fuvahmulah Atoll) and two in 1958 on Toddhoo and Kinbidu Islands. The final investigation was undertaken in Ariadhoo Island in 1959 (Forbes 1987). Varied types of material culture resulted from the excavations including coral-stone reliquary caskets and Buddha statues. The relics found within the Toddhoo stupa included a Roman denarius of a Republican date c. 90 BCE, which was photographed before being misappropriated in Male’ (Forbes 1984: 53). The final excavation in Ariadhoo recovered an alleged coral Hindu *siva linga*—these are generally associated with siva worship; although the statue itself was not retained, and was likely a votive stupa (Gippert 2004; Romero-Frías pers. comm. September 2015).

While no archaeological research took place in the 1960s, a significant find came to light during this period. This was the accidental discovery of four carved coral heads depicting aggressive fanged faces in Male’, which were unearthed during construction in 1962. Two of these were deposited in the National Museum and survived there until their destruction by extremists in 2012 (Forbes 1987:286; Bajaj 2012). Two of the coral heads were also reported to be four-sided *siva linga* and there was also some indication that symbols associated with Siva are depicted on one of the coral stones (Forbes 1987:286). This further contributed to the argument of pre-Islamic Hindu

influences present in the archipelago. However, these likely represent Buddhist guardian figures (Romero-Frías 1999; Gippert 2014).

The 1970s witnessed a re-instigation of research, although it was restricted mostly to surveys by Nils Finn Munch-Petersen and Jon Carswell. Munch-Petersen, a Danish social scientist and botanist, carried out research in the southern atolls of the Maldives in 1974 and 1977–1981. It was from these investigations that he proposed a ‘rather sketchy’ picture of the pre-Islamic period, which resulted in the development of a hypothesis that the early Buddhist period involved taro cultivation (Munch-Petersen 1982). Other research in the 1970s was conducted by archaeologist Jon Carswell, who was then attached to the Ashmolean Museum at Oxford. He conducted the first research on traded materials and investigated the presence of Chinese and Islamic ceramics in the Maldives and contextualized their presence into a broader Indian Ocean context. During these surveys he found an abundance of Chinese sherds in Male’ during both surveys and test excavations, although the exact amount remains unpublished. These were collected and are now held at the Ashmolean in Oxford (Carswell 1976:144).

The 1980–1990s marked a more scientific approach. A series of excavations were conducted jointly by the Kon-Tiki museum, the University of Oslo and the Maldivian Government from 1981–1984 (Skjølsvold 1991:1). The South Asian Association for Regional Cooperation Technical Assistance Programme (SAARC) conducted another in 1986–1987, which was followed in the consecutive decade with the first major excavation by Egil Mikkelsen of the Museum of Culture-History at the University of Oslo from 1996–1998 (Mikkelsen 2000). All three investigations documented early period Buddhist sites throughout the archipelago and focused not just on the monuments and reliquaries but also faunal remains, burials, ceramics and other associated material culture. The series of investigations headed by the Kon-Tiki museum were the first to return any radiocarbon dates from any sites in the Maldives, with three dates obtained from the Nilandhoo Foamathi (Nilandhoo Island in Faafu Atoll) and Gamu Havitha (Gan Island in Huvadhu Atoll) sites. Nilandhoo Foamathi had an early date of 660–740 CE and the samples from Gamu Havitha were rejected owing to issues related to insubstantial bone collagen. Mikkelsen built on this foundational chronology by obtaining 20 dates from the Kuruhinna Tharaagadu site

(Kaashidhoo Island in Malé/Kaafu Atoll), which ranged between 40 BCE–115 CE (T-13183) and 1260–1340 CE (T-13667). During this period, UNESCO had also planned to excavate covered Buddhist structures in 1983–1984; however, research was redirected to focus on the conservation of mosques, which was deemed politically appropriate at the time (Silva 1985).

As the above historical outline highlights the initial period of inquiry was marked by episodes of theft, vandalism and antiquarianism, with the major *modus operandi* being to compile economically valuable items of material culture, often recovered from coral-stone reliquaries contained within *havitha* or *gafuuni* and other items of value or interest, such as carved coral-stone slabs and statues. A consequence of the uncontrolled nature of the early excavations is the lack of contextual information concerning associated material culture. Additionally, these problems are further exaggerated by incomplete or missing excavation records from early excavations. Whilst antiquarian approaches have since been replaced by archaeological investigations, theft and vandalism are still problematic today, as exemplified by the complete destruction of Buddhist statues at the National Museum in Male' in 2012 (Bajaj 2012). The investigations of the 1970–1990s were essential in establishing baseline chronologies and a culture-history of the archipelago, building on the seminal work of HCP Bell in 1922. These later investigations have also refocused archaeological research in a direction of more controlled methods of excavations and survey and supported the recovery and documentation of non-valuable items such as ceramics, beads, faunal remains and burials.

4.5 The Archaeological and Historical Background

This section presents an archaeological and historical background to the Maldives. This includes a discussion of major themes including initial colonization, the Maldives and the Indian Ocean World, world religions in the Maldives, Austronesian contact, maritime technologies and early subsistence strategies. As outlined above, archaeological research has been conducted in the Maldives from 1848 through to the most recent investigations in 1998 by Egil Mikkelsen (University of Oslo). Except for earlier reviews by Forbes (1987) a complete and current overview has not been forthcoming, and this sub-section attempts to redress this.

4.5.1 Initial Colonization of the Maldives

Competing ideas surrounding early colonization exist and these have not been reconciled largely owing to a lack of detailed investigations. However, most models suggest either an Indian or Sri Lankan origin. The close proximity to neighbouring South Asian regions and the intersection of the Maldives with several trade routes would also suggest that many individual contacts potentially occurred during the early occupation of the islands. The earliest references to the Maldives in historical documents are too vague to support one particular colonization model. The islands have been suggested to be known at least at the writing of the Buddhist Jatakas c. 400 BCE (Vitharana 1997:140). Additionally, further reference to the Maldives has also been made in the Pali chronicles the *Dipavamsa* and *Mahavamsa*, which were composed between the end of the fourth century CE and the fifth century in Sri Lanka (Coningham 1995; Vitharana 1997). The *Mahavamsa* documents a simultaneous Indo-Aryan migratory event from India to Sri Lanka and the Maldives in the *Mahavamsa*, although the date is not known (Vitharana 1997).

As previously outlined, linguistic studies have examined the potential origin of the Maldivian language, known as *Divehi*, and could provide insight into colonization events. All point to a South Asian origin, as *Divehi* is of Indo-Aryan origin and contains other older Indic elements. Several different theories as to when Maldivian emerged from Sinhalese have been posited including a separation in the tenth century (Geiger 1996) and the twelfth century (Reynolds 2003). The idea of a simultaneous separation of Sinhalese and *Divehi* from a Prakrit language was put forward by De Silva (2009), although the timing is not known.

Maloney (2005) also argued that the islands were first colonized from Sri Lanka although the southernmost atolls retained stronger affiliations with the Sinhalese as he suggests a Tamil-Malayam colonization event likely occurred in the northern atolls, and he argues for a Malayalam ‘sub-stratum’ in the language, which remains present in ‘place names, kin terms, poetry, dance and religious beliefs’ (Maloney 2005). Additionally, Maloney argues that as a component of the northern colonization—the Lakshadweep (Laccadives)—located directly above the Maldives, were also first occupied by Tamil settlers. He argued that it was the retention of the Sinhalese

influence in the south that enabled the *Divehi* language and Buddhism to prevail throughout the entire archipelago.

4.5.2 *The Maldives and the Indian Ocean World*

The previous chapter detailed broader phases of interaction within the Indian Ocean. This subsection aims to examine exchange between the Maldives and the larger Indian Ocean. The *Periplus of the Erythraean Sea* documents the export of tortoise-shell from the islands (called ‘*Limiruke*’) in the first century CE (Casson 1989). Ptolemy wrote of a large number of islands (c. 1378) in front of ‘Taprobane’ (Sri Lanka) in 127–141 CE. Ammianus Marcellinus wrote of emissaries sent from the Maldives to Rome in 362 CE: ‘as far as the Divi and Serendivi vied with one another in sending their leading men with gifts ahead of time’. Cosmas Indicopleustes (535–550 CE) wrote of a ‘great emporium’ of islands with large quantities of coconut and fresh water. Abu Zayd’s work of 916 CE indicated that Indian traders sold water sourced from the Maldives to boats. Al Idrisi wrote an account contemporary to the introduction of Islam (c. 1099–1168). He mentioned the export of sea turtle, the extraction of cowry and the burning of sandalwood in the home (Maloney 2013). European documents cover the more recent periods including the work of Marco Polo, *The Rehla of Ibn Battuta* in the fourteenth century and the compendious writings of the shipwrecked French traveller François Pyrard de Laval, whose account of the islands (c. 1602–1607) is widely acknowledged to be the first ethnographic resource for the islands (Maloney 2013).

The undisputed link that connected the Maldives with the larger Indian Ocean was the export of cowry shell for use as money. The ‘money cowry’ as it relates to the Maldives has been detailed in Chapter One of this thesis. Owing to the depauperate nature of the islands, significant quantities of material had to be imported from other Indian Ocean regions. These included ceramics, metals, stone and glass in addition to other consumables not available in the islands. It is apparent that the majority was traded into the islands from South Asia (although trade links with other regions were apparent). It is important to note here that it is difficult to untangle the mechanism of exchange, particularly when trying to distinguish between direct and indirect exchange. The historical record has assisted in discerning between the two in some instances, but in the absence of such documents, it becomes a problematic exercise.

Very little material from the Western Indian Ocean has been located in the archipelago from early period sites or during surface surveys. The only cited example includes Sasanian-Islamic glazed ware found in undated contexts in the Maldives during the 1970s (Carswell 1976). Carswell argued that this low quantity of western material is indicative of one-way east to west traffic, which he claims is supported by a large quantity of Chinese sherds recovered in Male' (Carswell 1976:505). Several Arabic sources refer to the Maldives, including Sulaiman (900 CE), Abul Hassan (1026 CE), Al Biruni (1039 CE) and Al Idrisi (c. 1100 CE). All of these accounts document trade with the Maldives, mentioning the exploitation of cowry (*Monetaria moneta*) and the export of coir rope and tortoiseshell to other Indian Ocean regions. Later historical records c. 1500 CE suggest that the Maldives were utilized by ships travelling from the west, from: Quish, Hormuz, Mogadishu, Somalia, Zanzibar and Abyssinia (Van Mehren 1866). Mohamed (2003:2) supported the concept of direct contact from the west by suggesting that the Maldives were used as a waypoint by traders travelling from Arabia and East Africa, utilizing the monsoon to reach the Maldives en route to the spice islands in Southeast Asia (Mohamed 2002). Moreover, Al Masudi (916 CE) mentions exchange of materials between the Maldives and Oman and Siraf. One further suggested link can be seen in the tongue-and-groove method of mosque construction. The style of porite coral blocks present in the archipelago, which were bonded with mud, with a white plaster face, was a tradition introduced to the Lamu region in Kenya from a Red Sea/Yemeni origin prior to its appearance in the Maldives during the twelfth century (Waheed 2003).

Mikkelsen (2000) reported South Asian ceramic material has been recovered from Kuruhinna Tharaagadu. The main South Asian types include impressed or plain earthenware referred to in the literature as 'red ware'. The Archaeological Survey of India (ASI) noted that this 'red ware', which was devoid of slip, was often found in the forms of carinated bowls, *handis* (a wide mouthed Indian cooking vessel) and lids (Bopardikar 1992). Several other objects with a likely South Asian provenance include a bronze lamp of the Chola period style (ninth to eleventh century CE), silver and gold ring foils, a terracotta ram figure from India and varied bead types including those manufactured from clay, glass, shell, coral, carnelian, agate and quartz (Skjolsvold 1991; Bopardikar 1992; Mikkelsen 2000).

Additionally, other traded wares not directly originating in South Asia are likely to have been imported to the Maldives through South Asia. These include Roman and Byzantine coins. As previously mentioned, a Roman denarius c. 90 BCE was found in the Maldives, in the Thoddhoo stupa in 1959 (Forbes 1984). A small cache of gold Byzantine coins were located in 1986 on the island of Gan in Haddummathi Atoll and the coins were all minted between the fifth and sixth centuries CE and were recovered in a stupa reliquary (Mohamed 2005a).

Imports from East and Southeast Asia are not well represented in the archaeological record. China, Sumatra and the Moluccas were places known to Maldivians by 1500 CE and early Chinese sources dating back to the seventh century CE refer to the Maldives (Ptak 1987; Mohamed 2005a). The Maldivian copperplate the *Isdu Lōamaḥānu* mentioned the use of Chinese silk by wealthy Maldivian families c. 1153 CE (Mohamed 2005a). Ptak (1987:675) argued that trade from China to Arabia and Africa intersected the Maldives as it was a convenient stopover for those who ‘rounded the Dondra Head (Sri Lanka) and Cape Comorin (South India)’. Material from China and Southeast Asia would likely have been exported through Southeast Asian entrepôts or from South Asia.

Chinese porcelain has been recovered from almost all of the larger archaeological excavations in the Maldives. Carswell (1976) attempted to position the presence of such wares in the Maldives within broader dialogues concerning the trade of Chinese porcelain throughout the Indian Ocean. Copious quantities of sherds were present on the islands: ‘the streets and lanes [of Male’] are surfaced with finely packed coral-sand, and from the moment of our arrival we became aware of the fact that the sand was studded with sherds of porcelain. During the month we stayed on Male’, collecting sherds on the streets became a major activity, and each monsoon shower revealed a fresh crop’ (Carswell 1976:144). In 1976 surveys and excavations were conducted in the capital which resulted in the recovery of more East Asian wares; his investigations fortuitously coincided with a government land reclamation project and this involved the removal of topsoil from cemeteries to a depth of approximately 35 cm. Carswell utilized this opportunity to recover ceramics from a greater depth. In addition to these surface scatters and the cemetery topsoil recovery, two test trenches were dug near the confines of the garden of the old Sultan’s Palace, where several sherds were recovered.

Carswell purchased further chinaware from local markets—approximately nine dishes and celadon plates. He also issued an appeal on Maldivian radio for the donation of Chinese porcelain to the project. This resulted in the appropriation of one celadon cup (Carswell 1976). All sherds from the project are now catalogued at the Ashmolean Museum, Oxford. Unfortunately, none were retrieved from dated contexts. Limited material from Southeast Asia has been recovered in the Maldives. The most prominent example being a statue of potential Southeast Asian origin located on the Royal Island tourist resort (Mohamed and Tholal 2010). This has been tentatively identified as a bodhisattva of the Mon Dvaravati style and dated to between the ninth or tenth centuries (Ann Proctor pers. comm. 2013).

Interaction between the Maldives and the neighbouring island groups has only been documented in the anthropological work of Romero-Frías (1999). In the Maldives, Chagos and other island groups such as the Seychelles and the Mascarenes are known as ‘Hollhavai’ in the south and ‘Folovahi’ in the north. Oral histories suggest that Maldivians are largely uninterested in other islands for they held no trade potential and the travel required to reach the islands involved no safe anchorage. Romero-Frías suggests the origin of the name ‘Hollhavai’ derives from the Maldivian term for frigate birds (*Hura/Hora*) which nest in the south and originate in Chagos (Romero-Frías pers. comm. February 2014). An oral history was recorded that documented the loss of trading boats ‘being driven away by the wind and currents ... ending up lost in the wide limitless ocean’ (Romero-Frías 1999:19). A particular story indicated a group of Maldivians from the southern atoll of Fuvahmulah (Gnaviyani Atoll) ‘languished’ in Chagos after sailing off course and then utilized the frigate birds to send messages back to the Maldives. The origin of the word ‘Folovahi’ has been suggested to be associated with the period of time taken to reach Chagos without any intervening place to anchor and rest (Romero-Frías pers. comm. February 2014).

4.5.3 Major World Religions in the Maldives

The spread of major world religions, including Hinduism, Buddhism and Islam, across the Indian Ocean has been the focus of most of the archaeological research in the Maldives. These investigations are reviewed here. To date, no extensive archaeological or material culture evidence attributed definitively to Hinduism has been located in the archipelago—although there have been a small number of finds

that have been classified as ‘Hindu’. The first such item includes the reported *siva linga*, recovered at Ariadhoo Atoll in 1959 (Forbes 1987). However, as previously mentioned this object was soon destroyed after recovery which precludes it from being conclusively identified. The second item was a bronze *apsara* statue recovered in Haddhunmathi Atoll, which can be seen in Hindu and Buddhist mythology and is defined by Barnes (1995:183) as: ‘a flying deity prominent in Buddhist mural paintings’. A small *makara*—a crocodile-like sculpture—found in both Buddhism and Hinduism was gifted to Heyerdahl in 1983 by a local Maldivian (Skjølsvold 1991). Furthermore, the National Museum recorded and held a limestone carving of a monkey, which has been interpreted as potentially representing *Hanuman* the Hindu monkey-god. *Hanuman* is typically found during the period of Ramayana in the first millennium CE; however, it was common to have the Ramayana, a Hindu epic with general non-specific playful Hindu figures, present in Buddhist religious iconography (Mohamed and Tholal 2010). No available information provides any further details about its context; however, inscriptions on both front and back of the frieze are in the oldest form of *Divehi* script—the *eveyla akuru*—‘eveyla’ literally translates to ancient, and therefore means ‘ancient letters’ (Mohamed 2005a: 2). However, attributing these carvings to a Hindu period is problematic as they are fairly ambiguous—they have been observed in both Hindu and in Buddhist traditions elsewhere.

Evidence in support of an early Buddhist period has been more extensive, aided by it being the focus of archaeological research in the Maldives. Only two Buddhist sites have been dated, and these include Kuruhinna Tharaagadu, with an early date of 40 BCE–115 CE (T-13183) and Nilandhoo Foamathi with an early date of 660–40 CE. New dates from Nilandhoo Foamathi and a revision of previous radiocarbon dates from the Maldives are presented in Chapter Five. The earliest available epigraphic record also provides insight into the early Buddhist period. An inscription discovered in Landhoo in South Miladhunmadulu Atoll is considered to be the oldest inscription located in the Maldives and appears to be a version of a southern Brahmi script of the Pallava period (third and ninth centuries CE), which is dated to approximately the sixth century CE. The inscription detailed a mantra of Vajrayana Buddhism (Mohamed 2005a:3). Additionally, the majority of sites excavated in the Maldives have been *havitha* or *gafuuni* structures constructed of locally sourced coral-stone, either from *veliga* (soft coral stone) or *hiriga* (hard coral stone). Many ritual artefacts

have been located, including coral stone votive stupas and other engraved slabs of coral stone (Bell 1940; Skjølsvold 1991; Mikkelsen 2000).

Although the historical record for this period is extensive, the emphasis on early Buddhist period archaeology has resulted in a lesser focus on the later Islamic period (post-1153). Yosef's Mosque, adjacent to a *havitha* in Fuvamulah, Gnaviyani Atoll, was excavated in 1983–1984 (Skjølsvold 1991). The excavation was conducted with limited stratigraphic recording. As a consequence, contextual integrity is poor. One *mihrab* (a semicircular niche found inside mosques) was also found directly south of Majeedi Magu in Male' in Machchangoli Ba Miskit. Forbes (1987:288) suggested that it was of the style of marble carving from Gujarat dating to the late thirteenth to the fifteenth century. Lambourn (2004) detailed the distribution of this type of marble carving from Khambat. The spread of artefacts of this type made from Gujarati marble range from Kilwa in Africa, Dhofar in Arabia through to Indonesia. Lambourn also noted that in the Maldives, the only identified Khambat engravings were gravestones. Therefore, this *mihrab* adds to this inventory and represents a unique find.

The conservation of mosques has been more of a focus than the archaeology of the Islamic period. UNESCO conducted research in the Maldives with the goal being to 'identify a suitable archaeological site in need of excavation and conservation' (Silva 1985); however, subsequent to consultation with both authorities and locals about the scope of the project, the research was redirected to focus on the conservation of eight mosques. This attempt was followed by a nomination to the World Heritage List of six coral-stone mosques, which resulted in their tentative listing (Waheed 2003). The listing included: Ihavandhoo Friday Mosque, Meedhoo Friday Mosque, Male' Friday Mosque, Male' Eid Mosque, Fenfushi Friday Mosque and the Isdhoo Old Mosque. This tentative listing of mosque sites draws attention to coral-stone carving techniques in the Maldives. Owing to the limited amounts of construction materials present in the Maldives, live reef coral boulders or porite corals were extracted from the seabed and carved into stone blocks and then air-dried. Such coral stone construction methods were alleged to have existed as early as the Buddhist period, and continued until the introduction of stone-masonry in the later 1700s. Waheed (2003) suggested that mosque construction was refined during the Islamic period and that East African stone

building and stone carving techniques influenced the already established carving practice present during the Buddhist period.

4.5.4 Austronesian Contacts: Intercepting Long Distance Migration to East Africa

There have been some discussions surrounding the potential for Austronesian speaking people to establish contact in the Maldives en route to Madagascar and the Comoros (Maloney 2005, 2013). Fitzpatrick and Callaghan (2008) highlighted this voyaging potential by modelling several variables, including currents and wind. A strategy of downwind sailing would imply that the Maldives and potentially Chagos could well have been important waypoints on the voyage to Madagascar from either India/Sri Lanka or Sumatra. Conversely, downwind sailing from the west through to the east is not possible at any stage of the year, but other strategies for return through the Maldives are possible. In either scenario ‘it seems likely the Maldives, in such a central position, would have been relied on for resupplying and waiting for favourable conditions to continue the voyage. It might be expected that evidence of these stopovers will be found archaeologically in the Maldives, particularly if these voyages were repeated over time’ (Fitzpatrick and Callaghan 2008:56). Whilst there has been no clear linguistic link from Austronesian languages to Maldivian, Fuller *et al.* (2011) have highlighted a few potential loan-words, largely related to nautical terminology. There is also further support for this contact apparent in the Southeast Asian tradition of the *dhoni*, which is the traditional Maldivian fishing vessel (Green 2001:69; Manguin 2010). Additionally, there have been ethnographic parallels made to Southeast Asian practices, including the presence of a typically Southeast Asian post-partum bed-roasting ritual, found in the Southern Maldives (Maloney 2005).

4.5.5 Maritime Technology

The recovery of shipwrecks in the Indian Ocean has been somewhat limited because of the low survival rate of timber in warm Indian Ocean conditions (Ray 2003:80–81). As such, maritime technologies have been addressed through contemporary ethnographic studies of shipbuilding techniques, historical records, a discussion of nautical terms and the recovery of stone anchors. This review outlines relevant maritime technologies which have been discussed. Major studies into shipbuilding techniques include ethnographic research by Maniku (1998), Manguin (2001) and Green (2001).

According to Maniku (1998), the Maldivian construction of maritime craft is the product of inter-generational knowledge, with very few historical records documenting the tradition. Nonetheless, early records suggest that they were initially constructed from the local coconut timber. Coconut, which is a monocotyledon and does not produce secondary xylem, or ‘true’ wood, is not typically an easy timber to utilize in shipbuilding, hence the recent practice of importing Indian teak (Maniku 1998; Green 2001:69). Maloney (2013:154) commented that shipbuilding consisted of ‘sewn boats’, which is a consistent design found throughout the Indian Ocean. This is known as the ‘lashed-lug technique’ and involves planks being fastened together with coir rope. This was particularly effective in areas where reefs were located, as the ships were more elastic (Green 2001).

Maniku established a typology to document contemporary vessels, and presented an argument for their evolutionary development. He noted 16 different types of similar construction (1998:15). He has divided the boat types into three major categories, including smaller 2 m long row boats (*Bakkura*), fishing boats (*Mas Dhoni*) and larger passenger-cargo boats up to 22 m in length (*Odi*). The typical fishing craft, or *mas dhoni*, are completely open and are of variable lengths. Smaller varieties of *dhoni* designed for in-shore fishing exist and also for travelling between islands, which have been mechanized (*Sathari Dhoni*) after the advent of tourism in 1974 (Maniku 1998:15). There are inter-atoll trading boats and ocean-going craft called *odi*, which are lateen-rigged ketches, often referred to as schooners. Maloney (2013:151) noted the presence of a dug-out canoe in the Maldives (*oruvai*), but suggested that this one example had drifted over from Kerala in India; furthermore, they never came to be constructed locally, more than likely associated with the small girth of the abundant coconut timber (owing to the lack of secondary xylem, which increases girth).

Inter-archipelagic differences are considered by both Maniku (1998) and Maloney (2013). Both identified the presence of the lateen rig (*kati riyā*) in the north and a square sail in the southern atolls. Maloney (2013:156) suggested that the rectangular canvas sails utilized in the southern atolls were covered with red ochre, as they were in Bengal; however, the lateen rig present elsewhere is likely to also have been introduced via India, where it was originally introduced from Arabia. Maloney (2013)

made further observations about the differentiation between the southern and northern atolls and indicated that rowing was prevalent in the south and that the *dhoni* were also consequently smaller to accommodate the more labour-intensive process.

There is no consensus about the origins of the contemporary ships seen in the Maldives. Maniku (2013:13) examined what he considered to be construction similar to that in Southeast Asia and East Africa. Maniku also suggested that the Maldivian *dhoni* resembled in shape and style the reed bundle ships of Egypt, Mesopotamia and the Indus Valley. He deduced from the form that this was the origin of the design; he further noted that they have much more in common with the Phoenician ships built from wooden planks. Munch-Petersen considered the *dhoni* to be similar to Omani *dhow*. Maloney suggested a Sri Lankan affinity and more recent observations have been put forward by Green (2001) and Manguin (2001). Green (2001) argued for a similar construction design between the *dhoni* in the Maldives and ships in Southeast Asia—the shell is built first, and the strakes were constructed with a ‘series of paired carved lugs that were then used to locate a complex frame and beam system’ (Green 2001:69). Ray (2003:104) further elaborated on the technique of construction, indicating that the use of dowels had parallels in Malaysia and Sumatra, and continued in both South Sulawesi and the Maldives. Fuller *et al.* (2011:552-553) examined the linguistics associated with maritime technology, *Baraa* (outrigger) and *riyau* (sail) indicated a similarity to the Malay *barat* (crossbeam) and Proto-Austronesian *layar* (sail). However, Maloney (2013:155) considered *riyau* (sail) derived from Sinhalese. The time at which these words were introduced to *Divehi* is unknown.

The only direct material culture evidence for early maritime technologies is the presence of stone anchors. In the previous chapter the study of anchors in examining exchange throughout the Indian Ocean was mentioned, as associated with the Indo-Arab style of anchor (Ray 2003:80–81). However, the type found in the Maldives is the ring-stone anchor, locally known as *fanaa*. They were approximately 40–50 cm in diameter, constructed of local coral-stone, and formed a concave disc. The wooden stock was inserted into a central hole measuring approximately 6–10 cm in width. The *fanaa* were used during the course of bait-fishing in coral reef areas (Tripathi 2009). These ring stone anchors have been recovered off the Indian and Omani coasts (Ray

2003:81). Unfortunately, none have been recovered in dated contexts. These anchors were used until the 1900s, when they were replaced by iron anchors.

4.5.6 Early Subsistence Strategies

This section reviews previous research into early subsistence strategies in the Maldives. Because no archaeobotanical research has been conducted in the islands and very little faunal material has been returned from excavations throughout the archipelago, the majority of the information gleaned about these practices derives from the historical and ethnographic records. These records provide insight into cultivation practices, earlier crop and plant introductions and hunting.

Maloney (2013) conducted a survey of the entire archipelago and discussed particular cultivation practices in his ethnography, although he did not draw any conclusions about early strategies based on his observations. He differentiated between the practices in different regions, indicating an intensification and larger scale of cultivation in the south. However, he mentioned a more managed farming practice is present in the north which was completely absent from the south. He highlighted that this was likely derived from Kerala, whereas the southern home-garden practice probably arrived from Sri Lanka (Maloney 1980:288–289). Maloney (2013:303) further discussed the practice of coconut cultivation, which involved the *Raveri*, a caste responsible for tending to coconuts on uninhabited islands. He noted that an island's net worth is designated on a per-coconut tree basis.

The introduction of particular plant species has not been addressed outside of the ethno-historical literature. Fuller *et al.* (2011:553–554) discussed the early translocation of major Asian taxa to Africa including the greater yam (*Dioscorea alata*) and taro (*Colocasia esculenta*). Fuller *et al.* (2010) indicate that the likelihood of a coastal transfer is countered by an absence of these taxa from Northern India and Arabia, instead 'pointing to a central Indian Ocean corridor' (Fuller *et al.* 2011:553–554), which could indicate movement via the Maldives. Nonetheless, owing to a lack of contextual archaeobotanical records, nothing can be conclusively said about such lines of evidence.

The presence of yams (*Dioscorea* sp.), millet and wheat (of unspecified types) in historical periods has been noted in a Portuguese document by Valentim Fernandes in 1599. He described the islands and mentions Maldivians ‘eating millet which grows in small quantities on the islands’. Fernandes further suggested that local Maldivians have no awareness of yams and wheat, excepting those who had travelled outside of the islands (De Silva 2009: 364–370). Contra to this, in 1604–1607 the French traveller Pyrard de Laval was shipwrecked in the northern part of the archipelago. He observed the presence of locally grown millet, two yam varieties, in addition to fruits such as banana, cucumber, melon, figs and plums. Wheat and rice were imported at this stage from India and Sri Lanka (de Laval 1887:78). Differing information in these sources concerning the presence of yam in the Maldives highlights the reliability of using early records to establish these introductions.

The presence of taro was documented by Munch-Petersen who carried out a series of surveys in the southern atolls, the first in 1974 and a continuation during 1977—1981. There is a modern presence of *Colocasia esculenta* in the Southern Maldives, which is locally referred to as *ala*. There is also *Alocasia*, which is called *kahan ala* and is not grown in wet fields (Munch-Petersen pers. comm. November 2013). From these surveys of known and recently uncovered Buddhist monuments, toponymy, pedology, a botanical survey and a cursory survey of remains of gastropods and marine fauna from pits associated with recently constructed wells and irrigation channels, he established a preliminary picture of the early period. Munch-Petersen noted that specific plants and humus rich soils were consistently found associated with the Buddhist structures. From this he drew a tentative conclusion that taro cultivation was introduced during the early phases of Buddhist colonization, owing to the presence of ‘humus rich soil well-suited to taro growing’ found in association with such monuments.

Evidence of early hunting practices is minimal, but ethnographic and historical research provide some insight (Munch-Petersen 1982; Romero-Frías 1999; Maloney 2013). This will be covered in greater detail in Chapter Seven. Owing to the lack of arable land, no large domesticates were kept in the Maldives, in addition to the limited terrestrial fauna. Consequently, Divehi largely relied on marine fauna. Maloney (2013:17) discussed fishing practices and the favouring of the scombrid fish—tuna

and bonito. He indicated that these were caught in the open ocean with the small baitfish that had been previously captured in the reefs and shallows. Reef-fish, turtles, molluscs, crustaceans and octopodes are generally eaten when tuna is not available (Munch-Petersen 1982:75).

Munch-Petersen (1982) also observed the remains of the gastropods *Gibberulus gibbosus*, *Lambis lambis* and the bivalve *Atactodea striata*, in uncovered pits associated with the modern construction of wells in the Southern Maldives. He hypothesized that protein requirements could have been partially met by the acquisition of these shellfish.

Ethnographic material concerning use and consumption of marine turtle suggests the meat was not consumed locally without adherence to strict preparation methods, likely because of the potential for chelonitoxism. Pyrard de Laval described an incidence of poisoning during the early seventeenth century (de Laval 1602–1607). Munch-Petersen (1980:77) suggests that they are consumed, when other animals are not able to be obtained. Nonetheless, the export and use of the turtle shell is well documented within the historical records, including reference to Hawksbill turtle shell in the *Periplus of the Erythraean Sea*.

Bird and bird eggs were also consumed (Munch-Petersen 1982:75). The aforementioned reports of the consumption of larger frigate birds (Fregatidae) in the southern atolls has also been documented in local Maldivian oral histories. It was suggested that they flew seasonally from Chagos to the Maldives, where they were often hunted and eaten along with their eggs (Romero-Frías 1999:19). Ethnographic collections collected in the late 19th century, contain ‘bird traps’ consisting of wooden sticks with strings of gut attached (British Museum Item Number: As1893.1123.155.9).

4.6 Summary and conclusion

This chapter presented the Maldivian context. It provided an outline of the physical setting, the cultural context, and an archaeological and historical background. This latter section emphasized that initial colonization has not yet been addressed through archaeology, but historical and linguistic evidence suggest either an Indian or Sri

Lankan origin. Information surrounding the major export of cowry (*Monetaria moneta*) has been sourced largely from the historical record, although deposits of cowry have been found in archaeological contexts. Non-locally made ceramics, beads and coins have been found in Maldivian archaeological sites and therefore some discussion of trade has been engaged. It is clear that during the early phase of occupation, the majority of non-local material arrived via South Asia, with these materials present at all archaeological sites (with minimal materials from the Western Indian Ocean). Additionally, Chinese and Southeast Asian material has been found throughout the Maldives, of types attributed to the ninth to nineteenth century.

Additional structures and artefacts associated with Hinduism, Buddhism and Islam have been recovered from investigations. Evidence for potential Hindu influences present in the Maldives is confused with much associated material culture also potentially belonging to Buddhist traditions. The earliest dates from a Buddhist structure in the Maldives were obtained from the north central site of Kuruhinna Tharaagadu and suggest that Buddhism was present in the Maldives near the BCE/CE transition, with a later early date from Nilandhoo Foamathi at 660–740 CE. These dates and this chronology are revised in the upcoming Chapter Five.

Discussions surrounding maritime technologies point to a variety of influences, particularly to those of Southeast Asia and South Asia, the former being supported by linguistic terms found in the Maldives, originally appropriated from Austronesian contexts. Evidence concerning early subsistence has been largely based on ethnographic and historical accounts, which suggests an intensification of cultivation in the southern atolls and a major reliance on fishing in lieu of other domesticates available and a depauperate fauna.

The next chapter, Chapter Five, will present an overview of the excavated and surveyed sites included in this research: Kuruhinna Tharaagadu, Nilandhoo Foamathi, Bodu Havitha and Dhadimagi Havitha, alongside other surface scatters and finds. The excavations and surveys will be detailed in addition to a discussion of the reliability of associated radiocarbon dates, the addition of new dates and a revision of the currently accepted chronology and site formation models.

5

The Sites: Surveys, Excavations and Dates

5.1 Introduction

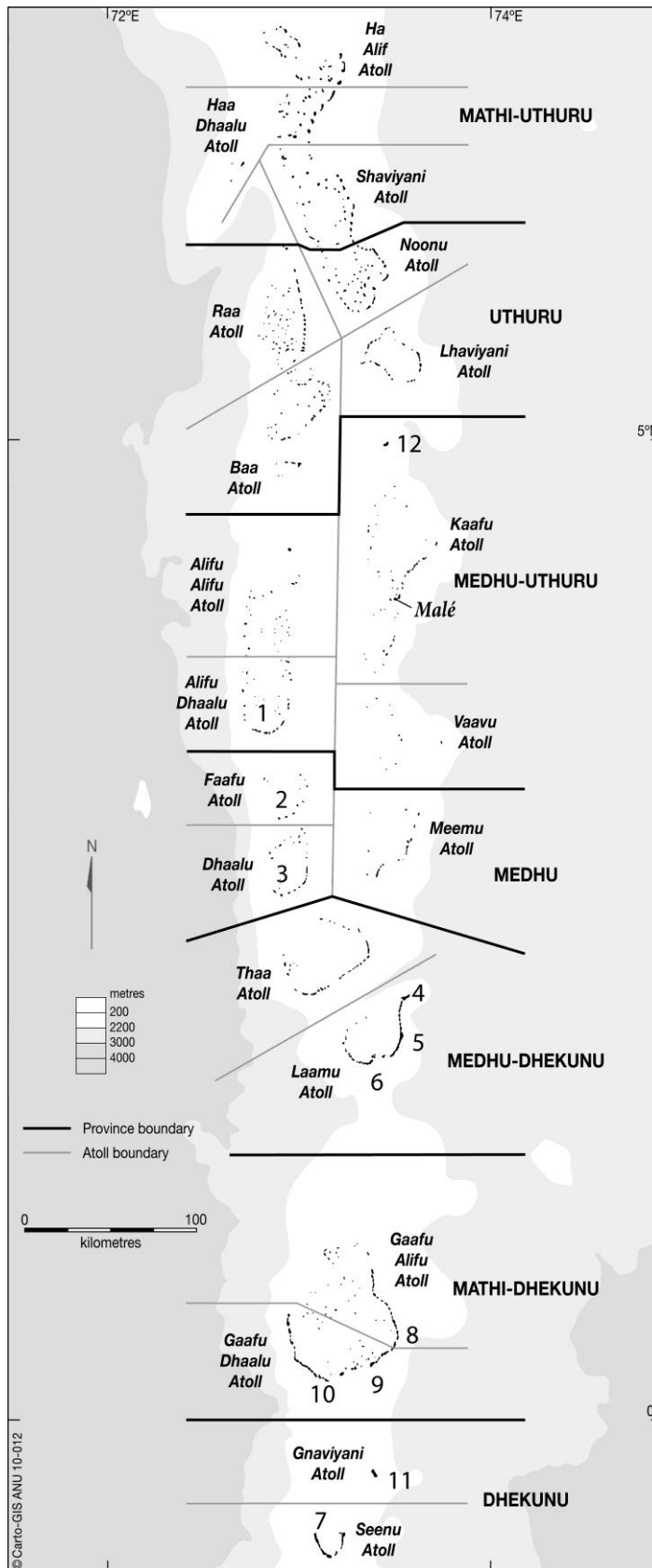
The archaeological collections analyzed in this thesis were from previously excavated Maldivian sites—this chapter outlines and describes these sites. The site investigations were undertaken during two larger scale projects: joint Norwegian-Maldivian Investigations during 1983–1984, directed by Arne Skjølsvold and Thor Heyerdahl (hereafter the NMI) and University of Oslo investigations from 1996–1998, directed by Professor Egil Mikkelsen (hereafter the UOI). First an overview of these two projects is presented, followed by a very brief discussion of surface scatters and individual finds recovered during the NMI. Detailed sections on the excavated sites from the NMI and UOI follow: Kuruhinna Tharaagadu was excavated in the north-central region, Nilandhoo Foamathi in the central atolls and Bodu Havitha and Dhadimagi Havitha in the southern atolls. The excavation history for each site is presented alongside the associated methods, stratigraphy, structural features, material culture finds, associated chronology and a discussion, which outlines the site occupation and formation. The artefactual finds will be documented in greater detail in the upcoming chapters (see Chapters Six, Seven and Eight). Updated and contemporary terminology is used in this thesis, including the term ‘excavation unit’ (XU) and ‘feature’ instead of ‘ruin’. The radiocarbon chronology is reconsidered, employing current calibration curves and methods in addition to the presentation of new dates (Reimer *et al.* 2013). Additionally, occupation and site formation models are revised. As such, previous research is consolidated, updated and reinterpreted in this chapter.

5.2 Norwegian-Maldivian Investigations (1983–1984) and the University of Oslo Investigations (1994–1996)

The Norwegian-Maldivian Investigations of 1983–1984 lasted approximately six weeks, for three weeks of each year during January/February. They were instigated at

the request of the then President, Maumoon Abdul Gayoom, whose interest in the early occupation period was fostered by Thor Heyerdahl's initial visit to the Maldives in 1982 (Skjølsvold 1991:5). All internal costs were funded by the Maldivian government, including between twenty and forty local Maldivian field assistants and transport on a government ship. The external costs were sponsored by the Kon-Tiki Museum, which included archaeological equipment and external transport to the Maldives (Skjølsvold 1991:5). Personnel from Norway included: Thor Heyerdahl, Martin Mehren, Bjorn Bye and archaeologists Arne Skjølsvold and Oystein Johansen; from Sweden, Bengt Jonson and Ake Karlson from Sebra Film and from the Maldives, Mohamed Ibrahim Loutfi, then director of the National Centre for Linguistic and Historical Research, Kela Ali Ibrahim Maniku and Abdul Waheed as interpreters and Kela Ali Ibrahim Maniku from Atoll Administration. In 1984 the team was the same, with a few additions and minus the film crew. Those from Norway included Thor Heyerdahl and archaeologists Arne Skjølsvold, Oystein Johansen and Egil Mikkelsen from the University of Oslo and Loutfi returned from the Maldivian National Centre for Linguistic and Historical Research; however, Ibrahim Maniku Don Maniku joined from Atoll Administration (Skjølsvold 1991:5–6).

During both field seasons, the itinerary covered the central and southern Maldives. The major locations visited can be seen in Fig. 5.1. In 1983, the crew left Male' and travelled south. The first year involved mainly reconnaissance, focussing on islands with archaeological potential (Skjølsvold 1991:11). The initial visit was to Ariadhoo Island in Ari Atholhu Dhekunuburi (Alifu Dhaalu Atoll), where a *havitha*, circular bath, mosque and other evidence of habitation were recorded. In Nilandhe Atholu Uthuruburi (Faafu Atoll), Nilandhoo Foamathi on Nilandhoo Island was excavated and 'Maadeli' or Temple Island was sighted, where Loutfi claimed a large number of Buddhist structures existed; however, no formal visit or survey was conducted. Next, the team visited Us Gandu, a 22 m diameter mound on Kudahuvadhoo Island in Dhaalu Atoll, also located near the earlier recovery of an animal sculpture and a Buddha head. The sculpture was returned to Male'; however, the Buddha head was reburied. The southern atolls were also covered in the itinerary and included Isdhoo Island in Haddhunmathi Atoll (Laamu Atoll), where a large dome-like *havitha* could be seen on the shore—allegedly the largest of these structures in the Maldives (Skjølsvold 1991:12).



1. Ariadhoo Island
2. Nilandhoo Island
3. Kudahuvadhoo Island
4. Isdhoo Island
5. Gan Island
6. Gadhoo Island
7. Hithadhoo Island
8. Kondey Island
9. Gan Island
10. Vadhoo Island
11. Fuvamulah/
Fua Mulaku Island
12. Kaashidhoo Island

Figure 5.1 Locations investigated during the NMI and UOI

Credit: CartoGIS, Australian National University

The team visited Gan Island in the same atoll, and re-examined the site associated with Bell's major investigations (Bell 1940). Further visits were conducted to the smaller *havitha*, the 'Mumbaru Stupa', in the district of Kuruhinna in the south of the same island (Bell 1940). Investigations of three *havitha* in poor condition were undertaken on Gadhoo Island and the discovery of a 25 m diameter x 2.5 m high *havitha* was made on Hithadhoo Island (Skjølvold 1991).

The team examined two *havitha* on Kondey Island in Huvadhu Atholu Uthuruburi (Gaafu Alifu Atoll) and visited two islands in the neighbouring Huvadhu Atholu Dhekunuburi (Gaafu Dhaalu Atoll); Bodu Havitha was excavated on Gan Island over 3–4 days and several limestone and coral-stone slabs were investigated on Vaadhoo Island. Fuvahmulah Island in the administrative division of Gnaviyani Atoll (Fuvahmulah Atoll) within the equatorial channel was the last island to be subjected to archaeological investigation—here a *havitha* and the adjacent mosque were excavated. In 1984, the itinerary did not involve reconnaissance, but further survey and excavation of the sites Nilandhoo Foamathi on Nilandhoo Island, Bodu Havitha on Gan Island and Dhadimagi Havitha on Fuvahmulah Island occurred.

The University of Oslo conducted fieldwork over three field seasons, from 1996–1998, and the UOI investigations were directed by Professor Egil Mikkelsen, who had participated in the NMI investigations. These excavations were conducted jointly with the National Centre for Linguistic and Historical Research in Male'. A monastery structure (*vihara*), Kuruhinna Tharaagadu, was the subject of these excavations on Kaashidhoo Island in Kaafu Atoll (Malé Atholhu). The site is situated just outside the outer limit of the village on Kaashidhoo and within a plantation of coconut, papaya and banana trees. During three field seasons 1,880 m² was excavated and 64 separate features were investigated and excavated (Mikkelsen 2000).

5.3 Surface Scatters and Individual Finds

This section briefly describes the surface finds of material culture located during the NMI from 1983 to 1984. No surface scatters or individual finds were recovered during the UOI. Several artefacts were recovered on Vadhoo Island in Huvadhu Atholu Dhekunuburi during reconstruction work, including limestone slabs and beads made

of carnelian and quartz (n=31) (see Fig. 5.20 for location of Vadhoo Island). Additionally, assemblages previously located and collected by local Maldivians were gifted to the NMI during their investigations in the Maldives. This includes a small assemblage of ceramic material collected by Mr Adigin, also on Vadhoo Island (n=4). A small collection of earthenware ceramics was recovered in topsoil by Ivar Hameed in Male', south of Villingilli Magu (n=4). Additionally, a *makara* statue (associated with Buddhist and Hindu traditions) was gifted to the NMI by Maldivians on Kondey Island in Huvadhu Atholu Dhekunuburi, where two *havithas* were also sighted by the survey team (Skjølsvold 1991).

5.4 Excavations in the Northern Maldives

During the investigations from 1996–1998, one site was excavated in the northern atolls of the Maldives—the monastery (*vihara*) site, Kuruhinna Tharaagadu, on Kaashidhoo Island by Egil Mikkelsen and the University of Oslo.

5.4.1 The Archaeology of Kuruhinna Tharaagadu

Kuruhinna Tharaagadu (or Tharagandu) was known as a 'house of worship' and according to Maniku (1983), the location of the longest surviving Buddhist tradition in the Maldives. The *vihara* (monastery) site is situated on the island of Kaashidhoo, which can be found between Lhaviyani and Kaafu Atoll (or Male' Atoll), and is attached administratively to Kaafu Atoll; see Fig. 5.2 for location. Kaashidhoo is located at a longitude of 73.459609 and latitude 4.956995, is 276.49 ha² and has a length of 2825 m and a width of 1025 m (Water Solutions Pty Ltd 2008:31). Kaashidhoo is currently an agricultural area and has a highly diverse marine and terrestrial fauna. It hosts the only population of land tortoises in the Maldives (Isles: Kaashidhoo n.d.). The littoral vegetation includes Pandanus, *Ficus benghalensis* (Indian Banyan) and the invasive *Adenanthera pavonina* (red-bead tree) (Thupalli 2009:7).

The excavated site was situated outside of Kaashidhoo Village in a coconut, papaya and banana tree plantation. Prior to excavation in 1996, there were slight elevations approximately 1.5 m high, with coral stones visible on the surface. The site underwent major conservation measures in 2010–2013, with plans to establish a cultural centre at the site (Isles: Kaashidhoo n.d.).

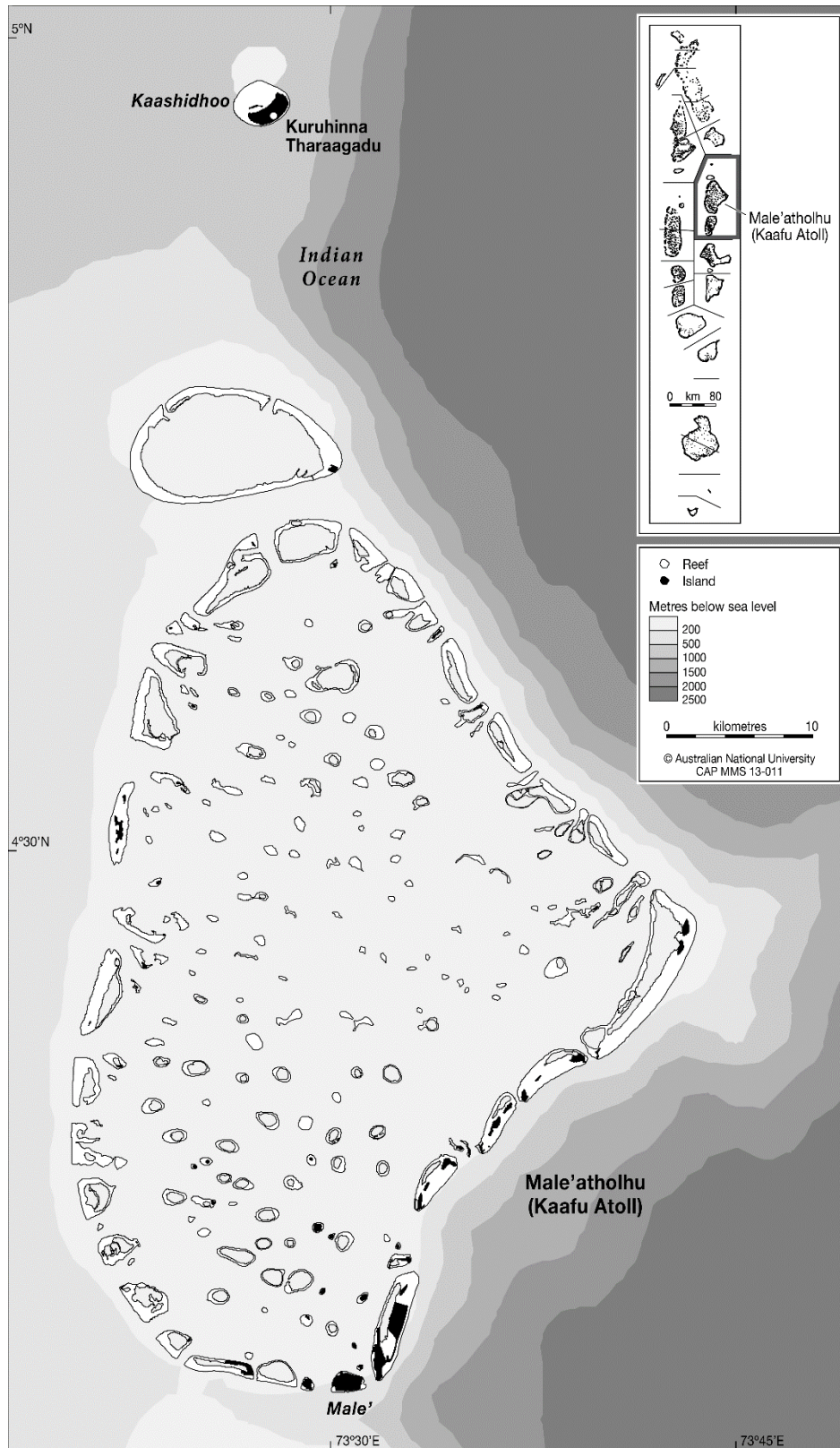


Figure 5.2 Location of Kuruhinna Tharaagadu (Tharaagandu), Kaafu Atoll.

(Credit: CartoGIS, Australian National University)

During three field seasons, 1,800 m² was excavated; the site plan from the first two field seasons can be seen in Fig. 5.4. The excavation was extended on the northern section in 1997, where several more features were uncovered, including an area where a thick layer of light grey sand had been intentionally deposited. When excavated to a depth of 60–70 cm, several dark ‘oblong’ shapes measuring 1.8–1.85 m and 0.35–0.5 m wide became apparent, revealing four human burials. Throughout the UOI, Mikkelsen located 64 ruins and four burials, which shall all be referred to as ‘features’ hereafter. The extent of the original monastery remains unknown, as Mikkelsen excavated only a portion of the complex (Mikkelsen 2000).



Figure 5.3 Northern Portion of Kuruhinna Tharaagadu

Credit: Egil Mikkelsen (Mikkelsen 2000:11)

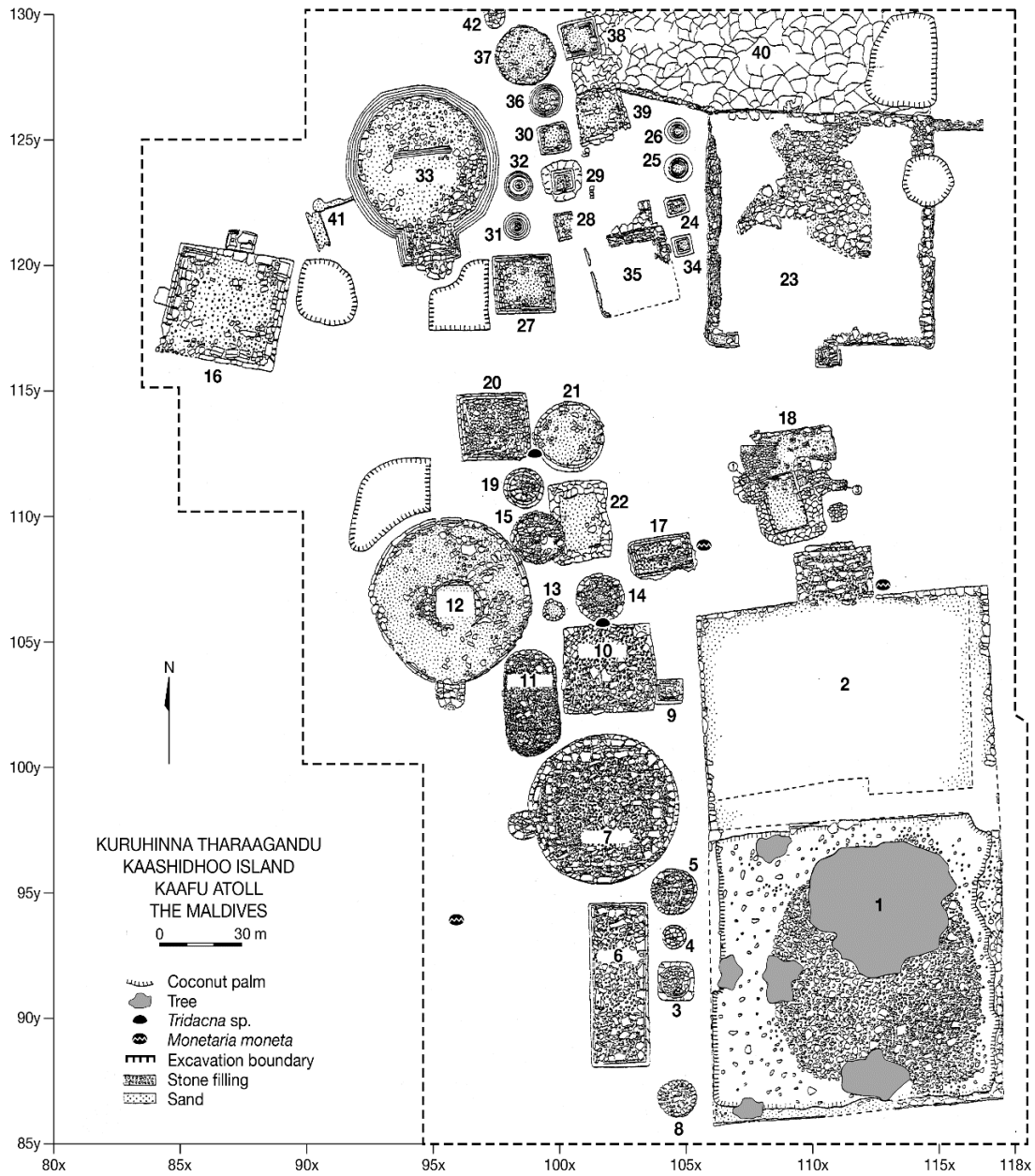


Figure 5.4 Kuruhinna Tharaagadu. Site Plan (1996-1998)
Credit: Modified from Mikkelsen (2000),
CartoGIS, Australian National University

5.4.2 Structural Features

The majority of features are the bases of probable wooden or perishable structures and only 30–40 cm (height) of these bases survive (see Fig. 5.3; Mikkelsen 2000). Some may have alternatively been the platforms of coral-stone statues and stupas that have since been removed or destroyed. These coral-stone bases have been infilled with coral-stone rubble and sand subsequent to the introduction of Islam in 1153 CE. Where excavation of structures occurred, the fill was removed from the structures as one unit and was not excavated by spit. As such, each feature at this site, except the grave, has only one associated excavation unit.

The structure types vary in size and shape. Table 5.1 broadly outlines the typological variation and infers a likely function, based on size, shape and context. Shapes included square, circular (some with ancillary features, i.e. steps), rectangular and 16-sided shapes and sizes range from 1–11.5 m.

Table 5.1 Likely function of structure types at Kuruhinna Tharaagadu (Mirani Litster)

Shape	Relative Size	Likely function (inferred from context)
Square	Small	NA
Square	Medium	<i>stupa</i>
Square	Large	Residence
Circular	Small	<i>stupa</i> or well
Circular	Medium	<i>stupa</i>
Circular	Large	<i>stupa</i>
Rectangular	Small	NA
Rectangular	Medium	NA
Rectangular	Large	Prayer Hall
16-sided structure	Large	<i>stupa</i>

5.4.3 Summary of Non-Structural Material Culture Finds

Considerable quantities of faunal remains were present at the site mainly as deposits of money-shell located between the structures and slightly adjacent to the monastery. *Tridacna* sp. deposits were also located at the complex, and found buried near the bases of structures. Additional tortoise, turtle and potential giant tortoise (*Aldabrachelys gigantea*) remains were also found at Kuruhinna Tharaagadu, and the placement of the tortoise and turtle on the platform of a feature (Feature 62) would suggest it was of some significance (Mikkelsen 2000). Relatively large amounts of ceramics were recovered at the site, including earthenware, stoneware and porcelain.

Other finds included small quantities of glass, coral and clay beads, metal fragments and a bronze Chinese cash coin. Excavation of the burial complex at the northern edge of the site revealed four human burials. These were found at a depth of 60–70 cm and each interment was oriented in a north-south direction, with the body positioned on the right side and the hands covering the pelvis. Burial goods included ceramics and metal rings (Mikkelsen 2000).

5.4.4 Dates

The dates obtained from the excavations have been derived from charcoal, shell, and bone samples. The samples were all processed through the *Laboratoriet for Radiologisk Datering* (Radiocarbon Dating Facility) in Trondheim from 1996 to 1998 and 1999 (Laboratoriet for Radiologisk Datering DF-2778). The RC dates for Kuruhinna Tharaagadu, Kaashidhoo Island, Kaafu Atoll are presented in Tables 5.2, 5.3 and 5.4. The results from these dates have been separated by sample type, and are accompanied by their corresponding probability plot (Figs 5.5 and 5.6).

Four charcoal dates were obtained on wood charcoal and have been calibrated here using OxCal4.2 and the IntCal13 Calibration Curve, for the Northern Hemisphere (Reimer *et al.* 2013). The charcoal has not been identified to type, as such, a caveat concerning potential inbuilt age must be considered. The likely source of timber on the island is coconut palm, although no ethnographic sources associated with hearth/oven or firing behaviour further informs the discussion. However, the restricted age range returned from charcoal samples from four different features supports the argument that a long inbuilt age is not a problem. If this were the case, clustering would be unlikely and an outlier would be expected (see Fig. 5.5).

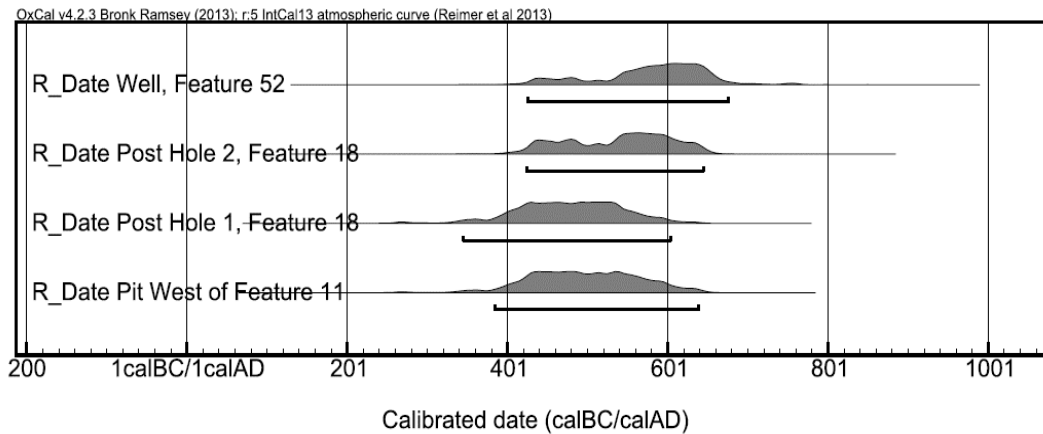
Six of the shell dates were obtained on *Monetaria moneta* and five on *Tridacna* sp. (Laboratoriet for Radiologisk Datering DF-2778). All shell dates have been calibrated with the Marine13 curve in OxCal4.2 (Reimer *et al.* 2013). Plants and animals which receive carbon from a marine source yield an ‘apparent age’. The surface ocean or ‘mixed layer’ (down to 200m) has a ^{14}C age that is on average 400 years older than that of the terrestrial or atmospheric reservoir. This is a consequence of the exchange between the atmosphere and the radiocarbon depleted deep ocean and is known as the ‘marine reservoir effect’ (Southon *et al.* 2002; Petchey 2011).

Table 5.2 Charcoal Dates for Kuruhinna Tharaagadu

Sample#	Feature	$\delta^{13}C$	F14C%	14Cage	Cal Ages (BCE/CE)			Sample Type	XU Unit	Comments and Reference
					From	To	Probability			
TUa - 1444	Pit West of Feature 11	-26.1	NA	1555 +/- 65	426	677	95.4	Unidentified Charcoal Sample	1	$\delta^{13}C$ estimated*
TUa - 1883	Post-hole 1, Feature 18	-25.5	NA	1580 +/- 60	425	645	95.4	Unidentified Charcoal Sample	1	*
TUa- 1884	Post-hole 2, Feature 18	-26.3	NA	1505 +/- 60	345	604	95.4	Unidentified Charcoal Sample	1	*
TUa- 2198	Well, Feature 52,	-26.4	NA	1415 +/- 70	385	639	95.4	Unidentified Charcoal Sample	1	Charcoal fill at base*

Int Cal 13 atmospheric curve (Reimer et al. 2013)

** (Mikkelsen 2000)*



*Figure 5.5 Charcoal Dates from Kuruhinna Tharaagadu, Kaashidhoo Island, Kaafu Atoll
Int Cal. 13 atmospheric curve (Reimer et al. 2013) OxCal4.2*

The modelled marine ^{14}C calibration curve (i.e. Marine13) automatically corrects for the reservoir effect, which averages the global surface ocean through time. However, further regional deviations from this global average must be considered and a local correction value, or a ΔR , needs to be applied. This can be calculated from charcoal/shell pairs (contemporaneous terrestrial/marine archaeological samples) or from samples collected prior to 1950 with a known age from different regions (Dye 1994; Druffel *et al.* 2001).

Presently, there are only a limited number of ΔR values reported for the Indian Ocean area, with few from the northern, western and eastern regions and none for the central (Dutta *et al.* 2001). A review of the available data highlights that ^{14}C levels in the Indian Ocean surface waters are substantially lower than the global surface water of the modelled reservoir age, which agrees with known oceanographic data (Stuiver *et al.* 1983). This is a consequence of a large amount of deep-sea water contribution to the surface layer. Several factors promote this throughout the Arabian Sea, the Western Indian Ocean and nearby regions. The complex northern and equatorial Indian Ocean circulation, discussed in Chapter Three (see Fig. 3.1), involves large seasonal variations such as reversals of major current systems, attributed to shifts in the monsoon. The SEC is present during the northern summer as a return flow south of the equator in a westwards direction (Tchernia 1980). The Arabian Sea gyre is closed by a northwards flow from the African and Arabian coastal areas and it is here that the most intense upwelling occurs. Further intense monsoon-related upwelling is

a feature of the Somali, Southern Arabian, Pakistani and Indian coasts (Wyrтки 1973; Swallow 1984; Toole and Warren 1993; Ganauchaud and Wunsch 2000). As a consequence, this region has relatively high ΔR values, including those found on the western side of Sri Lanka, which are consistent with the southeast transport of ^{14}C -depleted Arabian Sea water (Southon *et al.* 2002). The southeast flow of the Arabian Sea extends as far east as 80–100°E south of the equator and reaches Cocos-Keeling (Tchernia 1980; Toggweiler *et al.* 1991; You 1997). Therefore, it would be reasonable to consider that the surface ocean associated with the Maldives would be similarly ^{14}C -depleted.

An exception to this exists north of the Maldives— ΔR values in the Bay of Bengal are aberrant from other Indian Ocean values and consistently lower. This can be attributed to the large influx of freshwater from the north as seven major rivers feed this basin, which reduces the vertical mixing rate and therefore prevents the advection of the deeper, more ^{14}C depleted water. Similarly, low values can be seen in the Palk Bay Area, which is facing the Bay of Bengal. This is because this area has a shallow depth of <100m, with a corresponding mean ΔR of 32 +/- 20 yrs (Milliman and Meade 1983).

Therefore, the regional correction value applied in this research to archaeological shell samples from Maldivian sites was determined from the closest value, which is also associated with the Arabian Sea flow—the Malabar region in Kerala (and not from the Tamil Nadu sites, which face the Bay of Bengal and the shallow Palk Bay area). Therefore, all shell dates have been corrected with a ΔR of 138 +/- 64 yrs, which was determined from a *Paratapes textile* shell (CAMS-3927+39) (Southon *et al.* 2002).

To further complicate the calibration of shell dates, recent studies have illustrated that variation is probably more reflective of species, habitat and diet than regional variability (Petchey and Clark 2011; Petchey *et al.* 2013). However, very limited research has been conducted on the taxa present at Maldivian archaeological sites, which includes the herbivorous *Monetaria moneta* and *Tridacna* sp. (Petchey pers. comm. April 2014); therefore, what can be said for this is minimal. Consequently, until further research is conducted into these particular mollusc types, the local habitat

and also a more local Maldivian correction value, *these shell dates are presented as plausible, but also with caution.*

Radiocarbon dates from bone were also processed through the Trondheim radiocarbon dating facility. These were obtained from tortoise and human bone (from four separate individuals). The success of ^{14}C determination from bone is contingent on the preservation of the bone (i.e. insubstantial contamination and degradation) and the pre-treatment process in place to isolate bone protein (Petchey and Green 2005). Bone decay can be exaggerated in tropical environments, such as the Maldives. Additionally, corrections to the apparent age must be applied for different diets as ^{14}C is incorporated into the collagen from varied reservoirs. This involves the determination of the $\delta^{34}\text{S}$, $\delta^{15}\text{N}$ and $\delta^{13}\text{C}$ isotopes; however, because no access to the original bone samples from Kuruhinna Tharaagadu was possible, the radiocarbon determinations (and calibrations) initially reported by the Trondheim Radiocarbon Facility are presented again in Table 5.4 (Mikkelsen 2000). The spread of dates returned from the burials, like the charcoal samples, are also relatively tightly clustered and also fall within the mean age of the shell dates.

5.4.5 Discussion and Summary

The above calibration of charcoal, shell and bone radiocarbon dates from Kuruhinna Tharaagadu illustrate an occupation of the site from 345–604 calCE (95.4%) through to 1024–1224 calCE (95.4%). Despite the implicit issues outlined concerning the different materials dated, the calibration plots highlight that all separate dated features fall within a fairly restricted range, with the exception of two outliers, which are cowry shell deposits. Mikkelsen (2000) proposed a model for the occupation sequence at the site, which included several different stages of construction.

Table 5.3 Shell dates for Kuruhinna Tharaagadu

Sample#	Associated Feature	$\delta^{13}C$	F14C%	14C age	Cal Ages (BCE/CE)			Sample Type	XU Unit	Comments and Reference
					From	To	Probability			
T-12495	Feature 2	3	NA	1690 +/- 65	700	990	95.4	<i>Monetaria moneta</i>	1	Cowry shell (62,000)*
T-13180	East of Feature 17	2.3	NA	1680 +/- 40	740	965	95.4	<i>Monetaria moneta</i>	1	Cowry shell (106)*
T-13181	x96.0/y93.7	2.5	NA	745 +/- 75	1530	...	95.4	<i>Monetaria moneta</i>	1	Cowry shell (109)*
T-13667	x91.3/ y 95.0	2.6	NA	660 +/- 65	1685	...	95.4	<i>Monetaria moneta</i>	1 (10-15cm)	Cowry shell (218)*
T-13666	Inside Feature 63B	2.2	NA	1430 +/- 45	1024	1223	95.4	<i>Monetaria moneta</i>	1	Cowry shell (17)*
T-13665	Inside Feature 51	2.5	NA	1360 +/- 70	1042	1297	95.4	<i>Monetaria moneta</i>	1	Cowry shell (8)*
T- 13669	X118/y 135	2.1	NA	1685 +/- 45	729	968	95.4	<i>Tridacna</i> sp.	1	Tridacna shell deposit*
T- 13182	Feature 20/21	2.4	NA	1585 +/- 45	833	1048	95.4	<i>Tridacna</i> sp.	1	Tridacna shell *
T- 13668	Feature 62 x100.5/y131.5	2.2	NA	1530 +/- 60	871	1165	95.4	<i>Tridacna</i> sp.	1	Tridacna shell *
T- 12496	North of Feature 10	2	NA	1500 +/- 60	904	1185	95.4	<i>Tridacna</i> sp.	1	Tridacna shell*
T - 13183	Feature 18	2.1	NA	1880 +/- 65	506	787	95.4	<i>Tridacna</i> sp.	1	Tridacna shell*

AR = 138. Derived from correction values for the Indian Ocean. *Paphia textile* (Southon et al. 2002). Marine13 Marine Curve in OxCal4.2(Reimer et al. 2013) * Mikkelsen 2000

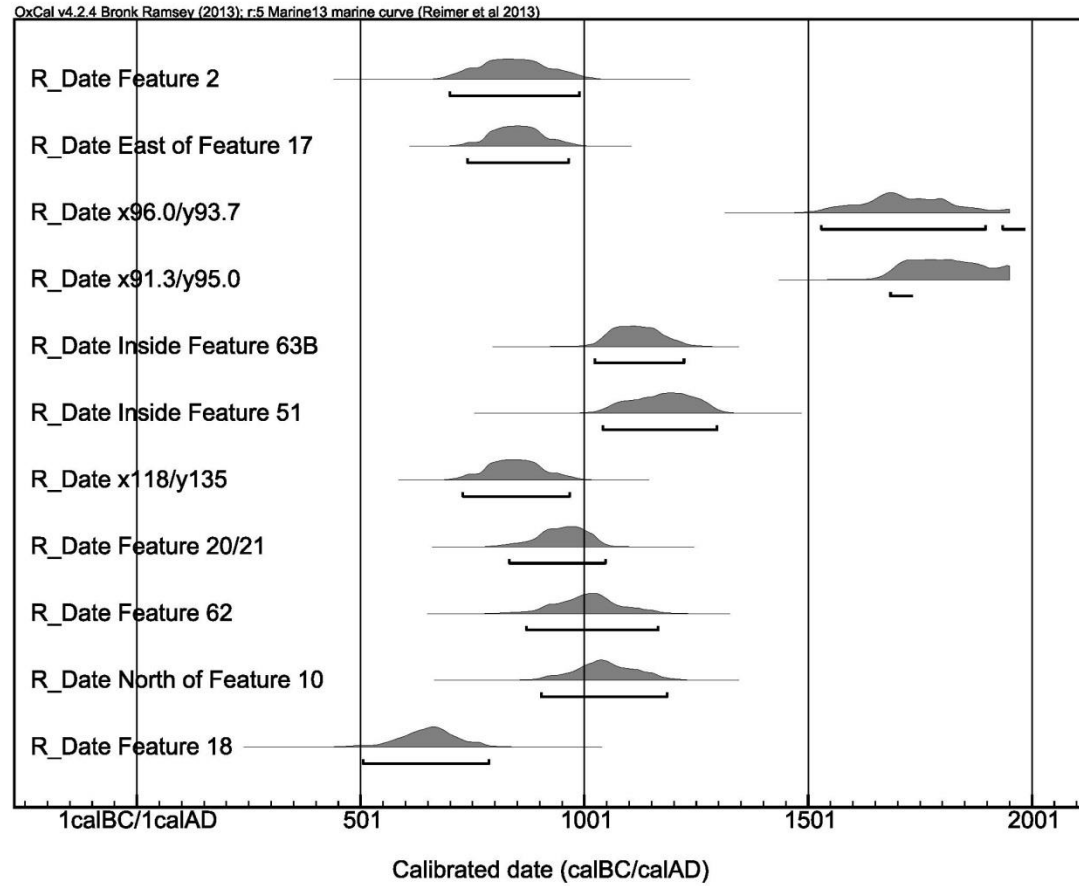


Figure 5.6 Shell Dates from Kuruhinna Tharaagadu, Kaashidhoo Island, Kaafu Atoll
 Marine 13 marine curve (Reimer et al. 2013) OxCal4.2

Table 5.4 Bone dates for Kuruhinna Tharaagadu

Sample#	Feature	$\delta^{13}C$	Weight (g)	14C age	Cal Ages (BCE/CE)		Sample Type	XU Unit	Reference
					From	To			
T-13578	Grave 3	-15.2	5.4	1100 +/- 70	885	1015	Human bone	1	*
T-13679	Grave 4	-15.7	12.8	1080 +/- 75	890	1020	Human bone	1	*
T-13680	Structure 62	-12.6	30.7	1220 +/- 55	725	885	? <i>Aldabrachelys gigantea</i>	1	*
Tua-2227	Grave 1	-14		955 +/- 65	1015	1170	Human bone	1	*
Tua-2228	Grave 2	-14.8		1015 +/- 65	985	1040	Human bone	1	*

*(Mikkelsen 2000)

He suggested that the structures were established on different levels, which involved the covering of old structures with white coral-sand in order to build newer structures. He suggests that the monastery began construction in the beginning of the third century CE and proposed that the main building phase took place c. 600 CE, corresponding to the first monastic period of the site. The use of several miniature stupas and offerings (such as cowry shell and *Aldabrachelys gigantea*) continued during the seventh and ninth centuries CE, which was followed by the final occupation period where a cemetery was introduced and positioned to the north of the monastery until the late twelfth century (Mikkelsen 2000). The application of a correction value, as detailed above, requires a revision of this model. As such, temporal phases are presented to facilitate a discussion of site construction and occupation (see Table 5.5).

Table 5.5 Phases of Construction at Kuruhinna Tharaagadu (Mirani Litster after Mikkelsen 2000)

Phase	Corresponding Date Range (CE)
Phase One	345–677
Phase Two	700–832
Phase Three	833–1023
Phase Four	1024–

An initial *Phase One* period encompasses the first construction phase. The recent calibration of previously accepted dates shifts this initial building period forward to 345–677 CE. The dates from the phase were obtained from wood charcoal samples and one from *Tridacna* sp. The earliest radiocarbon dates were recovered from two post-holes near Feature 18, which is supported by an early date derived from *Tridacna* sp. situated close to the same feature. These three dates imply this rectangular structure was present during the early occupation phase. Further early radiocarbon dates derived from wood charcoal were obtained from the base of Feature 52 (hereafter referred to as the ‘well’). The well was built into a plastered floor, which covered the northern part of excavation (Feature 40). Therefore, it is reasonable to associate the plastered floor with this first phase of construction. Mikkelsen (2000) likewise asserted that this was a ‘living floor’, utilized during the early construction and occupation of the monastery. Additionally, this floor was recovered underneath other structures, which

were separated by a dividing layer of light coral-sand and coral-stones. Feature 11 was also dated to Phase One and is rectangular in shape and located in the south-eastern area of the excavations. Except for the well, no circular features (*stupas*) or money shell deposits were dated to this early phase.

Phase Two of the monastery covers the period from 700–832 CE. Three dated features fall into this period, including a very substantial deposit of c.62,000 cowry shells north of Feature 2 (The Prayer Hall or *vihara*), see Fig. 5.7. Mikkelsen (2000) reasonably proposed this was some form of ‘sacrificial’ or other ‘intentional deposit’. One alternative possible use in light of its Buddhist context is that it represents donation offered by the laity (in this case, the local *Divehi*) to the *sangha* (monks) present in the monastery. Additionally, another relatively large cowry shell deposit east of Figure 17 (106), and a *Tridacna* sp. deposit between Ruin 10 and Ruin 14 also corresponds to this phase.



Figure 5.7 Large deposit of *Monetaria moneta* shells (Mikkelsen 2000:12)

Phase Three represents the period from 833–1023 CE and includes three dated *Tridacna* sp. shell deposits. One is from the area north of the complex at x188/y131.5; the second from between Features 20 (a square structure) and 21 (*stupa*) and the third is located north of Feature 10 (*stupa*). Additionally, the date returned from the

?*Aldabrachelys gigantea* bone also falls into Phase Three. These bones of ?*Aldabrachelys gigantea* were recovered atop a platform (Feature 62), indicating potential significance. Large quantities of land tortoise and marine turtle were also found at the site. Kaashidhoo is one of the only islands in the Maldives with a contemporary population of land tortoise (Isles: Kaashidhoo n.d.). *Tridacna* sp. deposits were recovered consistently in the foundations of features as they were placed prior to construction; therefore, owing to the majority of dated *Tridacna* sp. deposits corresponding to this phase, it likely represents another building phase.

Phase Four corresponds to the latest occupation of the site and includes the transition to Islam. All of these later dates are retrieved slightly outside of the complex or in the northern section of the monastery. This phase consists of dates from 1024 CE onwards and includes four cowry shell deposits and all of the directly dated human burials. Two smaller cowry deposits are located on the northern sector of the monastery, and two relatively large deposits (n=109 and 218) were found buried outside the western edge of the complex. The latter two were dated post the introduction of Islam; however, both fall within the historically acknowledged cowry processing era in the Maldives. Owing to their later dates, they are likely not associated with the monastery and might represent cowry processing/desiccating locations.

From the above outline, several phases of construction and activity at the site can be discerned. An initial building phase took place from 345–677 CE, followed by an occupation period during which large deposits of money shells were deposited. The third phase from 833–1023 CE indicates a second building period based on the dates of foundation deposits of *Tridacna* sp. The evidence of the ritual use of turtle at the site also corresponds to this period. The dates from the northern section of the excavations—beyond the plastered older floor—are younger, suggesting a northward extension of the monastery. This northern extension of the Kuruhinna Tharaagadu complex included the burial area, where all human remains have been directly dated to between 885–1170 CE, suggesting interment of these individuals occurred during the later phase of occupation (see Table 5.4). Cowry shell was found at the site in large deposits from Phase Two through to Phase Four, including a date close to when cowry was historically no longer considered valid as a currency.

5.5 Central Maldives

One site has been excavated in the central atolls of the Maldives, which is Nilandhoo Foamathi located on Nilandhoo Island (see Fig. 5.8) and was excavated as a component of the NMI from 1983–1984. This section outlines the archaeology, the structural features, non-structural material culture and chronology of the site.

5.5.1 The Archaeology of Nilandhoo Foamathi

Nilandhoo Foamathi (also referred to as Nilandhoo Foavvalhi) is located on Nilandhoo Island in Faafu Atoll, which is the name of both the administrative and geographic atoll (Waheed 2003:51). It is centrally located in the Maldivian archipelago and the exact location in Faafu Atoll can be seen in Figure 5.9. Faafu Atoll is a complex-atoll, consisting of approximately 2.2 km² of available land (Naseer *et al.* 2004:165).



Figure 5.8 Nilandhoo Foamathi, Nilandhoo Island, Faafu Atoll.

Credit: Kon-Tiki Museum

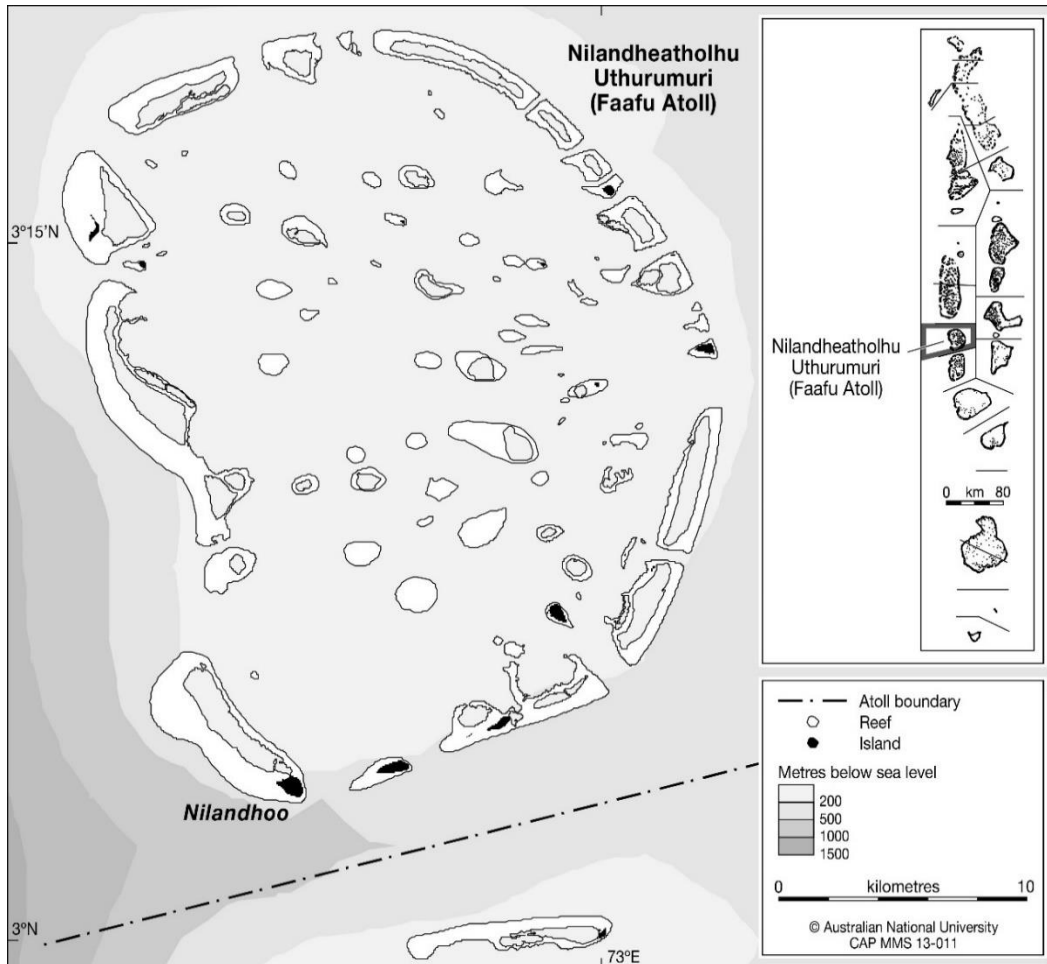


Figure 5.9 Location of Nilandhoo Foamathi (Nilandhoo), Faafu Atoll.

Credit: CartoGIS, Australian National University



Figure 5.10 Nilandhoo Foamathi Partially Excavated, 1984

Credit: Kon-Tiki Museum

Three historical sites exist on the atoll and Nilandhoo Island is of considerable cultural significance, as it was the location of the first mosque construction outside of Male’—Asaari Miskiiy (Water Solutions Pty Ltd 2008:40).

Remains of the Buddhist site are located to the east of the island and measure 44.5 m in circumference and 1.2 m in height, and the name is derived from the *Divehi* word for penis (Muhammad, pers. comm. May 2013), as an alleged *siva linga* was found at the site prior to the NMI investigations—this was likely a votive stupa. The coral-stone from the Buddhist site was reused to construct parts of the newer mosque and local houses on the island (Bopardikar 1992:176). At the time of investigation in 1983–1984, the dominant vegetation on the island was coconut (*Cocos nucifera*), Areca palms (*Areca catechu*) and breadfruit (*Artocarpus altilis*) (see Fig. 5.8).

Previous finds at the site, included two coral-stone votive stupas and three reliquaries, with one containing a gold rooster statue (Skjølvold 1991:16). Investigations at Nilandhoo Foamathi took place over the course of two field seasons in 1983–1984 and

initially consisted of vegetation clearance and excavation of the *havitha* mound. A major aim of this investigation was to obtain material for dating purposes, as no radiocarbon dating had been conducted prior to these investigations. These excavations focussed on four major features (see Fig 5.11). Each field season, approximately 20 Maldivians were hired to assist in the project and the oral history of the local islanders was also recorded.

5.5.2 Structural Features

The major structural finds consisted of two wall features (Features Three and Four), a *havitha* mound (Feature One), a partially excavated structure (Feature Two) and a circular bath (Feature Five). The focus of the investigation was Feature One, Feature Four and the partial excavation of Feature Two. The complex can be seen in Fig 5.11. A more recent mosque is located to the west of the complex and an old bath is positioned adjacent to this feature, and likely belonged to the earlier Buddhist complex (see Figs 5.11 and 5.17).

Feature One was excavated during 1983 and 1984. Two trenches were excavated across the interior of the *havitha* mound (see Fig 5.12). The trench from 1983 ran north to south (A–B); however, only the central square was completely excavated to the culturally sterile base layer. The adjacent trench excavated in 1984 (K–I) also ran from north to south; however, the full extent of the structure was not excavated; both trenches can be seen in Figs 5.13 and 5.14. The trench from 1983 was approximately 2 m in diameter, whereas that excavated in 1984 was 1 m in diameter. The stratigraphy from both trenches was similar and can be seen in the section plans in Fig 5.14. The soil descriptions are as in Table 5.6 and were arbitrarily defined. Unfortunately, no soil samples were available from these excavations to determine Munsell colours.

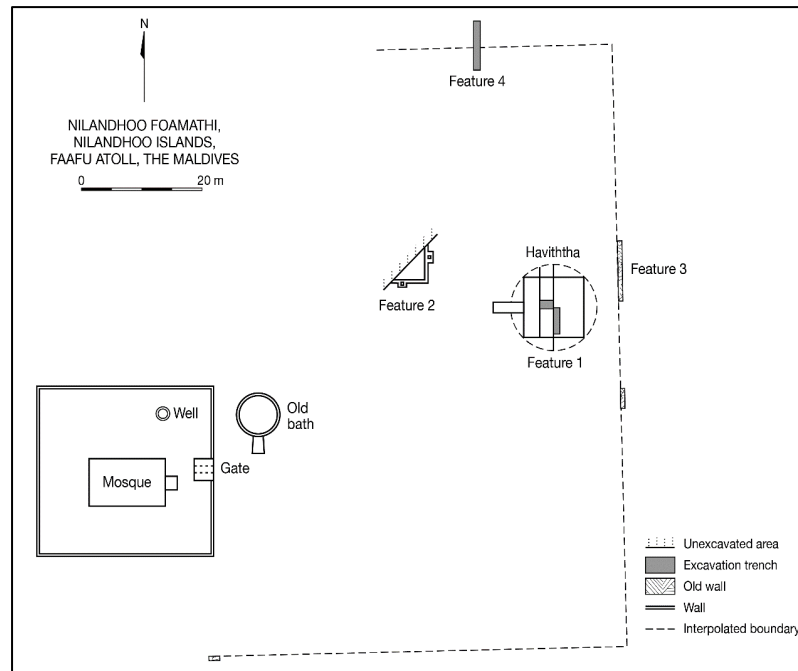


Figure 5.11 Site Plan for Nilandhoo Foamathi

Credit: After Skjøsvold (1991)

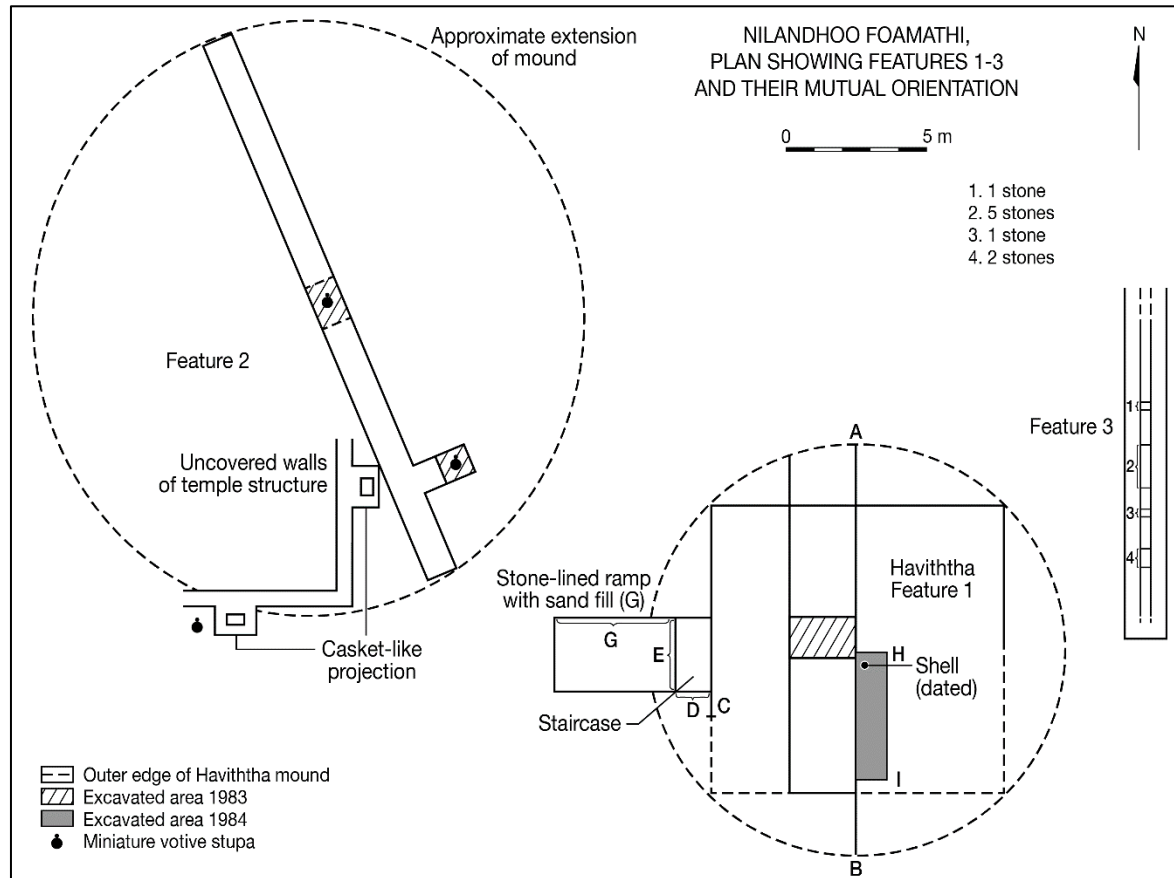


Figure 5.12 Trenches across Feature 1, Nilandhoo Foamathi

Credit: Kon-Tiki Museum

Table 5.6 Stratigraphy of excavated areas, Feature 1, Nilandhoo Foamathi (details from Skjølvold 1991, adapted by Mirani Litster)

Layer	Description
Layer One	Topsoil, reached an average depth of approximately 15–20 cm. Greyish brown in colour.
Layer Two	Greyish sandy fill. A maximum depth of 20 cm–1.25 m at the centre of the trench A–B.
Layer Three	1.25m–1.4 m. A thick stratum of sand mixed with humus. Greyish-brown.
Layer Four	1.4m–1.65/1.7 m. Sand and scattered stones.
Layer Five	1.7m–1.8/1.85 m. Thick layer of fine sand, beach sand.
Layer Six	1.85m–2 m. Culturally sterile. White sand.



*Figure 5.13 Plan showing Features 1, 2 and 3, Nilandhoo Foamathi
Credit: After Skjølsvold (1991)*

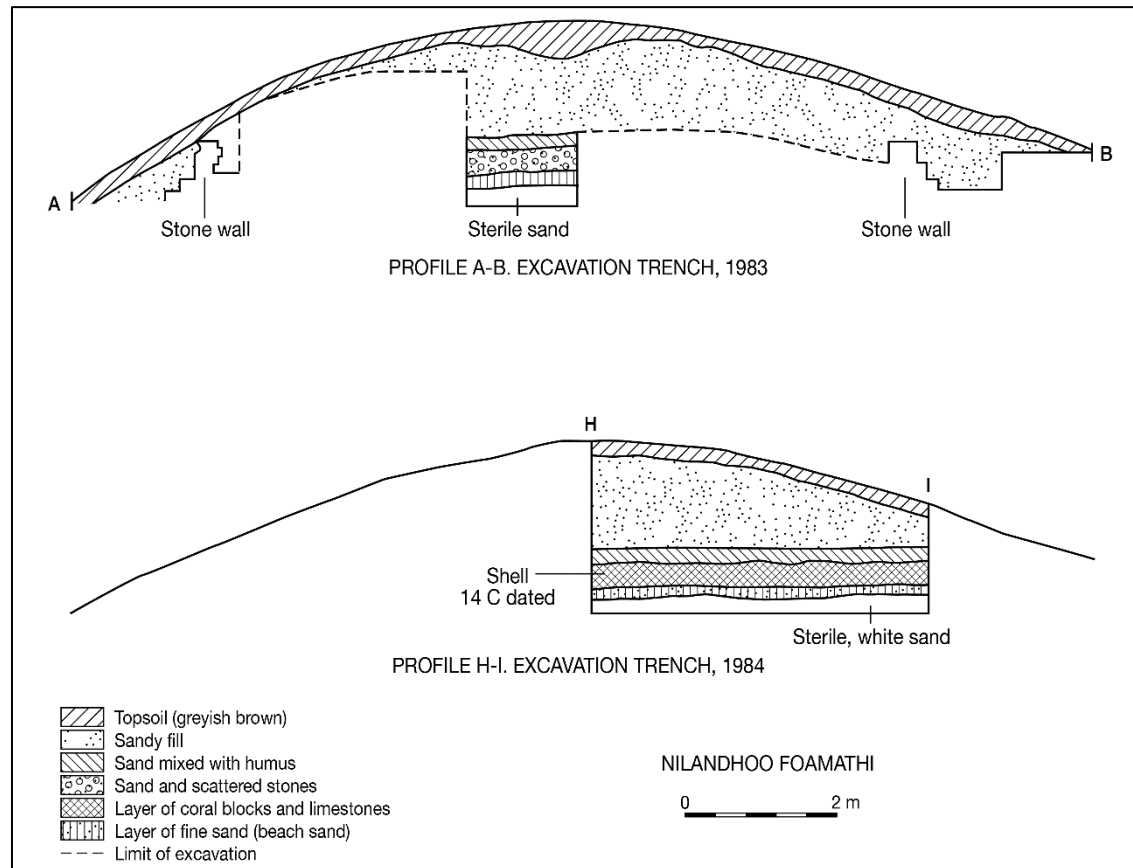


Figure 5.14 Feature 1 Profile, Nilandhoo Foamathi
 Credit: After Skjølsvold (1991)

The northern section of Trench A–B revealed moulded stones, which were the wall of the structure. This was composed of seven blocks of greyish limestone, forming a stepped projection. The upper limit was located just below Layer One. The profile for the excavated wall can be seen in Fig. 5.15. The northern section was first exposed, followed by the southern. The southern was similar to the northern, except more damaged. Once both north and south walls were exposed it became clear that the structure was square, with a length of 10.30 m. The western side revealed the remains of an old staircase, measuring approximately 2.6 m in width and projected 1.3 m outwards. The southern wall was excavated over both seasons; additionally, a stone-lined pathway extended four metres from the western face. Skjølsvold (1991) suggested that the remains of the built feature represent the base of a structure which had no internal rooms.

Feature Two was initially a 20 m mound and was partially excavated. It was situated 10–15 m west of the *havitha* structure; additionally, two votive stupas had been previously located here. In 1983 a 1 m wide trench was laid out across the mound in a N–S direction. The south-east section of the trench was extended by 2 m. Throughout this trench, several non-structural finds were located, which are to be detailed in the forthcoming section. However, between field seasons unsanctioned excavation of the area uncovered parts of a stone structure (seen in Fig 5.13). One small find was returned to Male’ and the rest were ‘thrown in a heap’ and buried (Skjølsvold 1991: 37). In 1984 the NMI cleaned the area subsequent to the vandalism but they did not, however, excavate further.

Feature Three was first discovered during the excavation of Feature One. A wall structure was located when a trench approximately 12 m long and 1 m wide was excavated, at a depth of approximately 25–30 cm. Skjølsvold (1991:40) suggested that these stones have been reused from another structure as they are not uniform in size, and appear similar to those found on the wall of the *havitha* (Feature One).

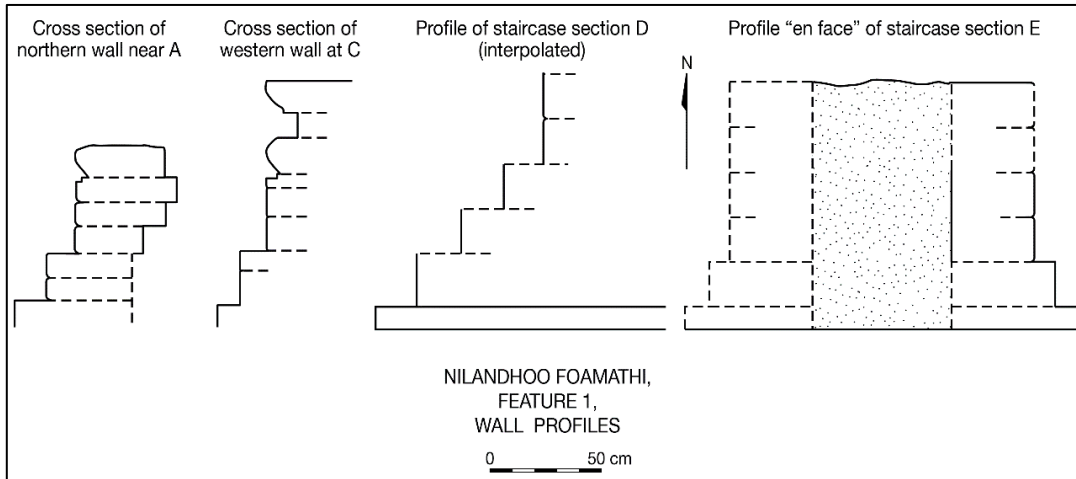


Figure 5.15 Nilandhoo Foamathi, Feature 1 wall-profiles

Credit: After Skjsvold (1991)

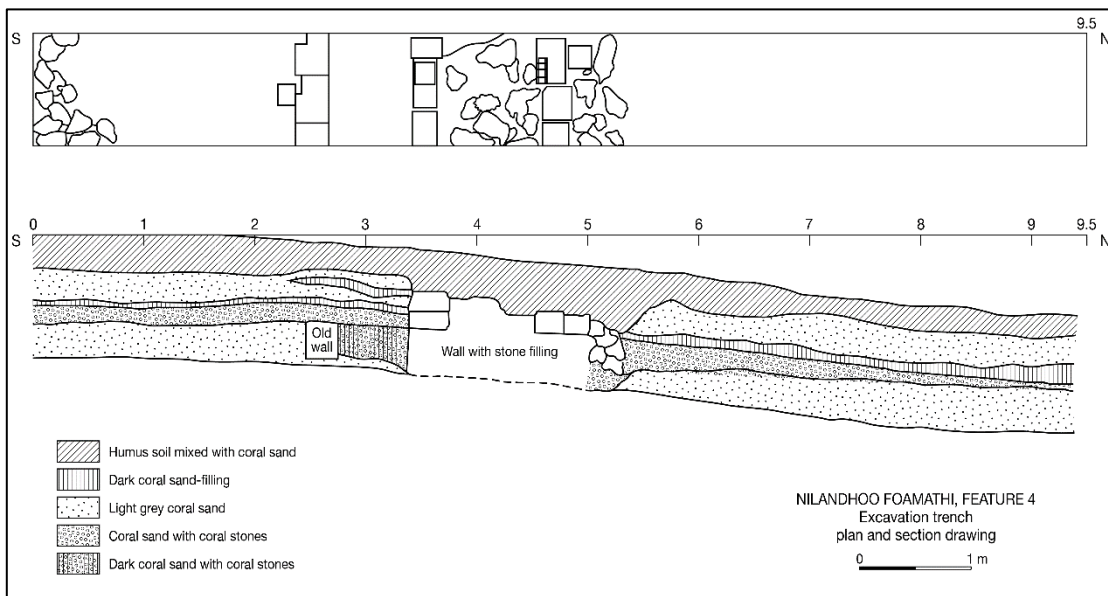


Figure 5.16 Feature 4 plan and section drawing, Nilandhoo Foamathi

Credit: After Skjsvold (1991)

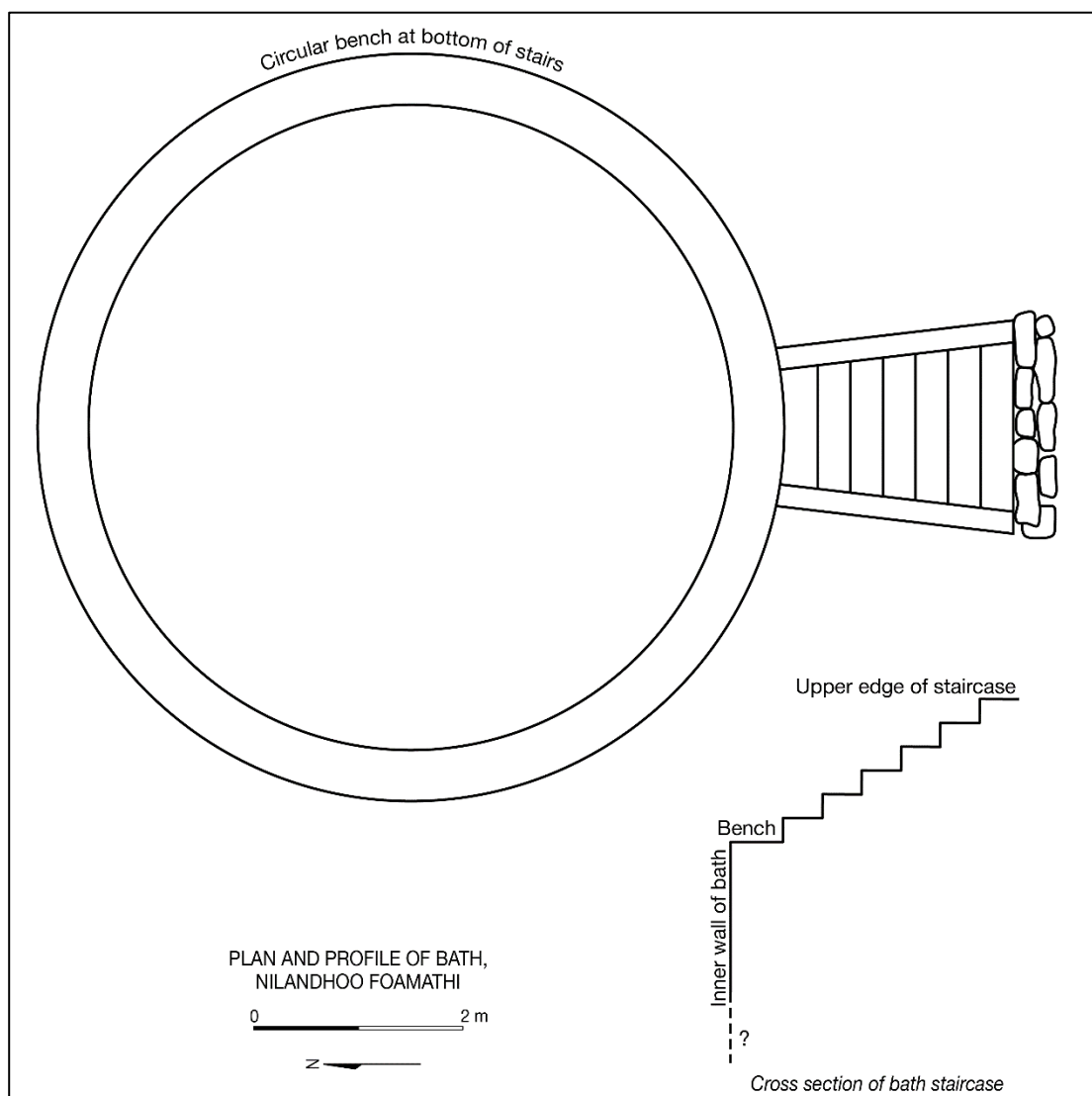


Figure 5.17 Bath (Feature 5), Nilandhoo Foamathi

Credit: After Skjøsvold (1991)

This is supported by the presence of two separate walls found in a trench across the northern section of the complex, revealing Feature Four at the northern section. In this trench, evidence for an older and younger wall became apparent (see Fig 5.16). In addition to these four features, a bath was located adjacent to the newer mosque area in the south-western portion of the complex. This bath (Feature Five) was only partially uncovered, but was circular and ‘well preserved’ (see Fig 5.17).

5.5.3 Summary of Non-Structural Material Culture Finds

This section aims to summarize non-structural material culture finds from the Nilandhoo site complex. Few small finds were recovered from Feature One; the 1984 excavations found two cowries and another shell (*Strombus* sp.), small pieces of

undecorated earthenware, a small piece of bird bone and two profiled stones. During the excavation of the foundation walls, a cylindrically shaped disc in addition to a profiled masonry stone (with triglyphs and metopes) were recovered and a fragmentary stone was found, in addition to five pieces of undecorated earthenware.

Non-structural material culture finds from the excavations adjacent to Feature Two consisted of limestone votive stupas (n=13) and a small amount of undecorated earthenware (n=2). In the centre of the trench, at a depth of approximately 30 cm, five votive stupas were located, along with two pieces of undecorated earthenware. These included what Skjølsvold (1991:33–34) has classified as ‘miniature tower stupas’ and ‘dome-shaped’ votive stupas. One was of the miniature tower stupa variety and four of the ‘dome-shaped’ variety. Additionally, it is necessary to mention that the ‘tower’ stupas may either be the top of a reliquary or a finial or spire intended for a miniature stupa, and discussed in Chapter Eight. The maximum diameter of the dome-shaped stupas was between 38–35 cm. All were made of limestone. The eastern extension of the southern portion of the trench contained miniature limestone stupas (n=8). One was a ‘tower’ stupa and the rest dome-shaped; four additional disc-shaped specimens were also located. Closer to the structure, one dome-like stupa of limestone was uncovered, in addition to six miniature fragmentary stupas. These miniature stupa finds totalled n=20, with local Maldivians contributing a further eleven stupas recovered prior to the excavations. As such, a total of 31 miniature stupas and two pieces of earthenware were recovered in proximity to Feature Two, albeit with no associated context.

Feature Three was discovered during the excavation of Feature One (*havitha*), and appeared to be a wall construction composed of a ‘haphazard’ collection of stones that may have been initially sourced from one of the internal structures. No non-structural finds were located here; however, organic material was obtained in order to date the feature.

Feature Four was located along the northern section of the excavated area and has been preliminarily detailed by Mikkelsen (Skjølsvold 1999:185). The trench uncovered a refuse area, which also became the first stratigraphically documented artefact sequence in the Maldives. This following section outlines the stratigraphy in addition

to the small finds in their context. The location of the excavation can be seen in Fig. 5.10; however, the plan and profile of Feature 4 and the excavation can be seen in Fig. 5.16. The stratigraphy can be seen in Table 5.7.

The upper layer (XU1–XU4) consisted of a dark humic soil mixed with coral-sand. This layer varied in depth along the trench, from 20–50 cm. At about 3.5 m north of the southern end of the trench, the top of the ‘new’ wall was located. This wall was approximately 1.3 m wide, and constructed of reused stones, possibly from the *havitha*. The construction methods of Feature Four were similar to that of Feature Two (Skjølsvold 1999:186). The base of the wall was reached at 60 cm below the surface. In between the wall was coral sand with coral-stone filling. The majority of vertebrate faunal remains from this trench came from XU1–4, with a notable decrease in the excavation units below. Shells were also recovered from this upper layer, in addition to 5.5 g of charcoal. In the more recent layers, pottery was found on the northern side of the trench—mostly undecorated potsherds. Additional items were found, which included glass sherds of green, transparent, light green and yellow-brown varieties. One bone bead was found, in addition to a thin piece of hammered copper.

The stratigraphy of the southern section of the wall included a layer of light grey coral-sand (XU5 and 6, between 40–60 cm deep), with a lens of dark coral-sand fill, which was interrupted by the new wall. XU6 was a complete intermixed layer of dark coral sand below the light-grey coral-sand. XU7 and 8 (60–80 cm deep) was a coral-sand layer with coral-stone inclusions. It was on the southern section of the new wall where the most pottery was found in the lower layers, primarily between the two walls, in addition to a mosaic bead of blue, red and yellow glass.

Faunal material was less prevalent than in the layers above, however molluscs and vertebrate fauna were still present. The older wall was found at the base of XU8. On the southern side of this older wall was a light grey coral sand (XU9 and 11, 80–110 cm deep). The sediment on the northern side of the old wall was a dark coral sand, also with coral stones. Culturally sterile was reached at 1.10m.

Table 5.7 Feature 4, Nilandhoo Foamathi, Maldives, Stratigraphic Units (Details from Skjølsvold 1991)

Excavation Unit (XU)	Description	Between Old and New Wall	N of New Wall	S of New Wall	Comments
1	Dark humic soil mixed with coral sand	NA	NA	NA	
2	Dark humic soil mixed with coral sand	NA	NA	NA	
3	Dark humic soil mixed with coral sand	NA	NA	NA	
4	Dark humic soil mixed with coral sand	NA	NA	NA	
5	NA	NA	Light grey to white coral sand	Dark coral sand fill	
6	NA	NA	Light grey to white coral sand	Dark coral sand fill	
7	NA	NA	Grey-greyish brown coral sand	Grey-greyish brown coral sand with large coral blocks	
8	NA	Dark coral sand mixed with humic soil and several limestone fragments with branch impressions.	Grey-greyish brown coral sand	Grey-greyish brown coral sand with large coral blocks	* old wall uncovered at a depth of 72 cm on the southern side of the wall, base of wall at about 100 cm.
9	NA	Dark coral sand mixed with humic soil and several limestone fragments with branch impressions.	Light brown coral sand with a few coral stones	White coral sand with irregular coral stones in upper portion	*limestone fragments with branch impressions, part of an old floor
10	NA	Greyish brown sand, with some humic soil	Greyish-brown coral sand	White coral sand	
11	NA	Greyish brown sand	Greyish-brown coral sand	White coral sand	*culturally sterile was reached at 110 cm

It was between this old and new wall where four pieces of glass were found, in addition to a sherd of glass from a perfume bottle. Layer 11 produced one shell fragment with four intentionally carved parallel lines. Faunal remains were found between the walls, but these were mostly molluscs.

The sediments from the northern side of the new wall included light grey coral sand at XU5 (40–50 cm). XU6 (50–60 cm) was a dark coral sand filling, which was followed by a coral sand with coral-stone layer in XU7–8. Light grey coral sand was found in XU9–11, until culturally sterile was reached at 1.10 m. Faunal material was present north of the new wall, including both vertebrate and invertebrate marine fauna. Ceramic material was found, although in lesser quantities than the southern side. Very few non-ceramic material culture items were found on this side of the trench. One piece of light green glass and one tubular piece of copper were found in Layer Five.

5.5.4 Dates

The dates obtained from the excavations have derived from charcoal and shell samples. The results from these dates have been separated here by sample type, and are accompanied by their corresponding probability plot (Figs 5.18–5.19).

An initial series of dates were obtained in 1984—these samples were processed through the *Laboratoriet for Radiologisk Datering* in Trondheim (Laboratoriet for Radiologisk Datering DF-2778) and the results are included in this section. However, because a major aim of this research was to refine previous interpretations of the early Maldivian occupation period, further dating samples were sought. As outlined in the section dedicated to Kuruhinna Tharaagadu, major issues concerning a lack of known wood charcoal samples and reservoir correction values complicate the reliability of previously accepted dates. Therefore, further dating samples were obtained by the author (Mirani Litster) and where possible, the short-lived *Cocos nucifera* nut shell was sourced (n=5); however, some unidentified charcoal was processed (n=2), where *Cocos nucifera* nut shell was unavailable. Seven charcoal dates were obtained from Feature Four and have been calibrated using OxCal4.2 and the IntCal13 Calibration Curve (Reimer *et al.* 2013). The new charcoal samples from Nilandhoo were processed through the Waikato Radiocarbon Dating Laboratory in 2011 (Wk 30389–30394).

All marine shell dates have been calibrated with the Marine13 curve in OxCal4.2 (Reimer *et al.* 2013). Two shell dates were obtained (*Strombus* sp. and *Lambis lambis*) and processed by the *Laboratoriet for Radiologisk Datering* (DF-2778). All dates have been corrected with a ΔR of 138. Issues surrounding the regional ΔR value have been outlined in greater detail in the previous section on Kuruhinna Tharaagadu. Furthermore, *Strombus* sp. and *Lambis* have not been widely studied in terms of ^{14}C dating, and therefore a similar caveat to that offered in Section 5.3 is offered here concerning shell dates.

The dates returned from Nilandhoo Foamathi range across the site, from 249–393 calCE (95.4%) (Feature Four) through to 1170–1423 calCE (95.4%) (Feature One). The earlier dates derived from the charcoal located in Feature Four, and the most recent from the marine shell samples from Features One and Two (see Tables 5.8 and 5.9).

5.5.5 Discussion and Summary

The earliest dates from Nilandhoo Foamathi are associated with the refuse deposit (Feature Four) at the northern limits of the complex. Dates from Features One and Two post-date the historically acknowledged introduction of Islam. Skjølsvold (1991) had proposed a model for the site formation, which included an early construction of the old wall (Feature Four) followed by the construction of Feature One (the *havitha*). However, recent recalibrations as mentioned above returned a date from the fill of Feature One that was contemporaneous to the introduction of Islam, highlighting that the shell sample was probably associated with the deliberate covering of the Buddhist monument. Feature Two was also surrounded by an excess of 30 votive stupas (dome- and tower-type) grouped in clusters, indicating that they may have been dumped and covered during the same period.

Feature Four provides good insight into overall site usage through time, owing to the controlled excavation methods with a larger number of dates obtained. The earliest dates were associated with a *Cocos nucifera* sample from Layer 11 (100–110 cm), dating to a period of 249–393 calCE (95.4%) (Wk-30394). This is earlier than a date from the same layer but located on the northern section of the trench on unspecified charcoal from a period of 389–866 calCE (95.4%) (T-5577). There is an inversion

throughout the sequence, where an older date was returned from Layer Two on *Cocos nucifera*, 775–968 calCE (95.4%) (Wk-30389), and is followed by a more recent date from XU4 from an unknown charcoal sample dating from 1601 calCE (95.3%) (Wk-30391). This is suggestive of post-depositional movement of charcoal between XU1–XU4. This inversion supports the case for more intensive dating regimes at sites in the Maldives as not only had it not been previously identified, but large disturbances and the attendant taphonomic issues will be expected at early period sites, owing to the significant volume of material used to intentionally cover the sites and the damage associated with vegetation growth (see Figs. 5.8 and 5.12).

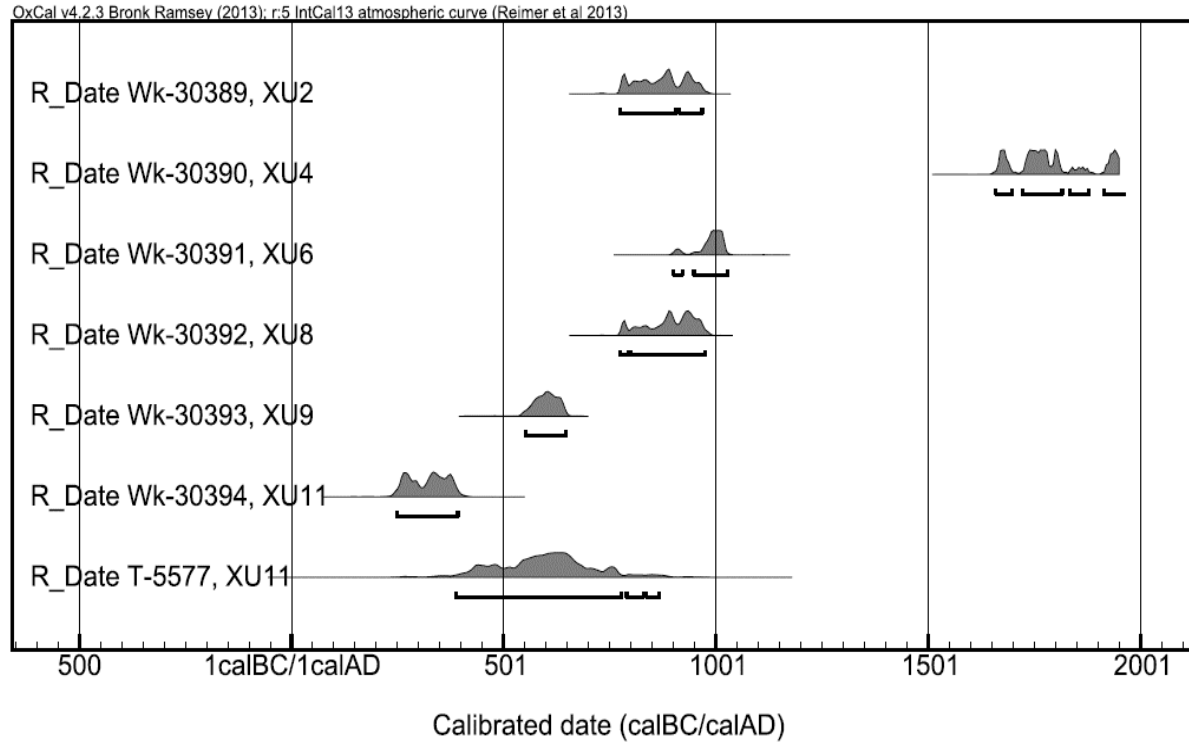
Cultural material from the refuse deposit reveals a prevalence of shellfish use and fish consumption during the Buddhist occupation of the site. The deposit found between XU1 and XU4 contained rat and chicken. Fragmentary bird bone was also found in association with the fill of the *havitha* during the Islamic phase. Ceramic material was associated with all layers; however, in the earlier layers greater proportions were found on the southern side of the excavation trench. Glass was found throughout, although mainly in the most recent excavation units. A mosaic bead, a modified cowry shell and a perfume bottle were found in the lower layers associated with the Buddhist period.

An *Elasmobranchii* vertebra bead was found in the first layer. Charcoal was found in all layers and the ceramic material recovered from XU11 appeared to be abraded, indicating water rolling during this early phase of deposition (Skibo and Schiffer 1989:91).

Table 5.8 Charcoal Dates for Nilandhoo Foamathi

Sample#	Feature	d13C	F14C%	14Cage	Cal Ages (BCE/CE)			Sample Type	XU Unit	Reference
					From	To	Probability			
Wk-30389	Trench 4	-23.7 +/- 0.2	86.6 +/- 0.3	1156 +/- 30 BP	775	968	95.4	<i>Cocos nucifera</i>	XU 2	New Data
Wk-30390	Trench 4	-28.6 +/- 0.2	97.9 +/- 0.4	171 +/- 30 BP	1660	...	95.3	<i>Unknown charcoal sample</i>	XU 4	New Data
Wk-30391	Trench 4	-24.3 +/- 0.2	87.8 +/- 0.3	1048 +/- 30 BP	900	1028	95.4	<i>Cocos nucifera</i>	XU 6	New Data
Wk-30392	Trench 4	-24.2 +/- 0.2	86.7 +/- 0.3	1145 +/- 31 BP	776	975	95.4	<i>Cocos nucifera</i>	XU 8	New Data
Wk-30393	Trench 4	-24.0 +/- 0.2	83.4 +/- 0.3	1462 +/- 30 BP	552	647	95.4	<i>Cocos nucifera</i>	XU 9	New Data
Wk-30394	Trench 4	-25.2 +/- 0.2	80.8 +/- 0.3	1717 +/- 30 BP	249	393	95.4	<i>Cocos nucifera</i>	XU 11	New Data
T-5577	Trench 4	*Trondheim	*Trondheim	1430 +/- 110 BP	389	866	95.4	<i>Unknown charcoal sample</i>	XU 11, North of Wall	Skjølsvold (1991)

Int Cal 13 atmospheric curve (Reimer et al. 2013)



*Figure 5.18 Charcoal Dates from Nilandhoo Foamathi, Nilandhoo Island, Faafu Atoll
Int Cal 13 atmospheric curve (Reimer et al. 2013) OxCal4.2*

Table 5.9 Shell Dates for Nilandhoo Foamathi

Sample#	Feature	d13C	F14C%	14Cage	Cal Ages (BCE/CE)			Sample Type	XU Unit	Reference
					From	To	Probability			
T-5575	Feature 1	2.1		1230 +/- 70	1170	1423	95.4	Shell	NA	*
T- 5576	Feature 2	2.1		1340 +/- 40	1096	1289	95.4	Shell	NA	*

$\Delta R = 138$. Derived from correction values for the Indian Ocean. *Paphia textile* (Southon et al. 2002). Marine13 Marine Curve in OxCal4.2 (Reimer et al. 2013)
* (Skjølsvold 1991)

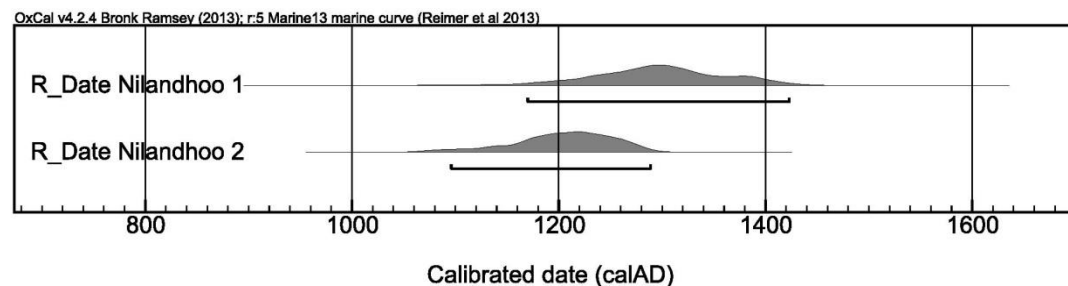


Figure 5.19 Shell Dates from Nilandhoo Foamathi, Nilandhoo Island, Faafu Atoll Marine 13 marine curve (Reimer et al. 2013) OxCal4.2

5.6 Excavations in the Southern Maldives

Two excavations have taken place in the Southern Maldives, although not on the same scale or with the same resolution as those conducted in the north and centre. Additionally, only one radiocarbon date was obtained for these sites, but was rejected. These sites include Bodu Havitha on Gan Island in Huvadhuatholu Dhekunuburi and Dhadimagi Havitha in Fuvamulah.

5.6.1 *The Archaeology of Bodu Havitha*

Bodu Havitha ('the big mound', alternatively known as 'Vadamaga Havitha' [Skjølsvold 1991:43]) is located on Gan Island in Ghaafu Dhaalu Atoll (see Fig. 5.20). Gan Island is no longer inhabited as an unspecified epidemic at the end of the eighteenth century resulted in rapid depopulation; however, local mythology relates this abandonment to an invasion of large cats (Romero-Frías 1999). Cultivated fields of yam, manioc and coconut trees on the islands are harvested by Maldivians from neighbouring Gaddhoo Island. Several large *havitha* mounds are present, one of which is Gamu Havitha, in the centre of the island. The western and south-western shores contain two mounds. There is another mound on the south-eastern shore, and Bodu Havitha is located on the north-western portion of the island, adjacent to another large mound (Skjølsvold 1991; Waheed 2003).

Archaeological work on Gan included three days in 1983 and six days in 1984, both during February and March. The research focussed on Bodu Havitha and involved a team of local workers (approximately 30–40) and researchers from the Kon-Tiki Museum in Norway. In 1983 the vegetation was cleared from the topsoil in order to establish the limits of the structure. The height of the mound was approximately 9 m and had a maximum dimension of 9 m (Skjølsvold 1991). In the 1984 field season, the remaining outer walls of the structure were excavated but owing to time constraints and the difficulties associated with penetrating the *havitha*, the decision to open four adjacent trenches was made in an attempt to obtain cultural material and organic material for ¹⁴C dating. For the final plan of the *havitha* and associated excavations, see Fig. 5.23.

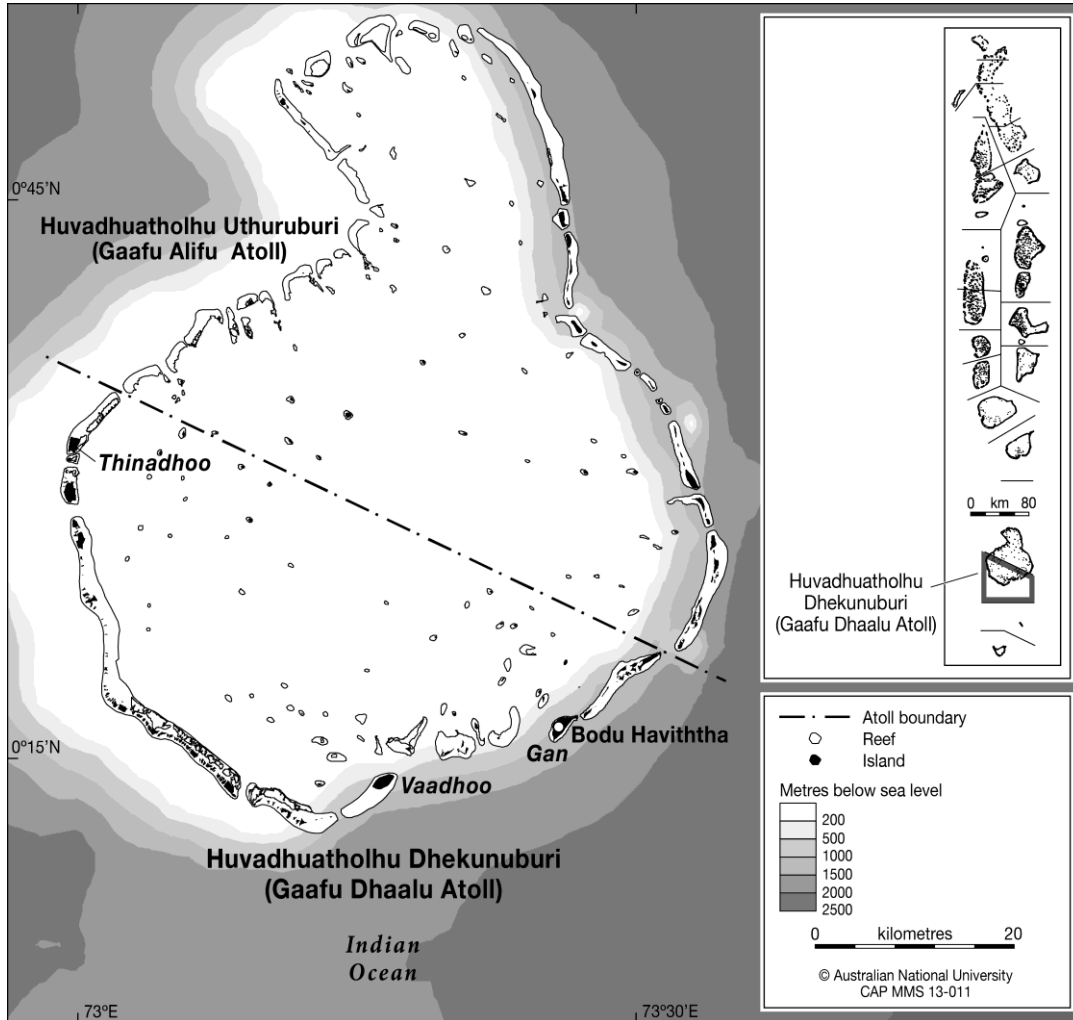


Figure 5.20 Location of Bodu Haviththa/Haviththa and Vaadhoo Island, Gaafu Dhaalu Atoll

Credit: CartoGIS, Australian National University



*Figure 5.21 Bodu Havitha, Gaafu Dhaalu Atoll
(Southeastern clearance during 1983)*

Credit: Kon-Tiki Museum



*Figure 5.22 Bodu Havitha, Gaafu Dhaalu Atoll
(During excavation)*

Credit: Kon-Tiki Museum

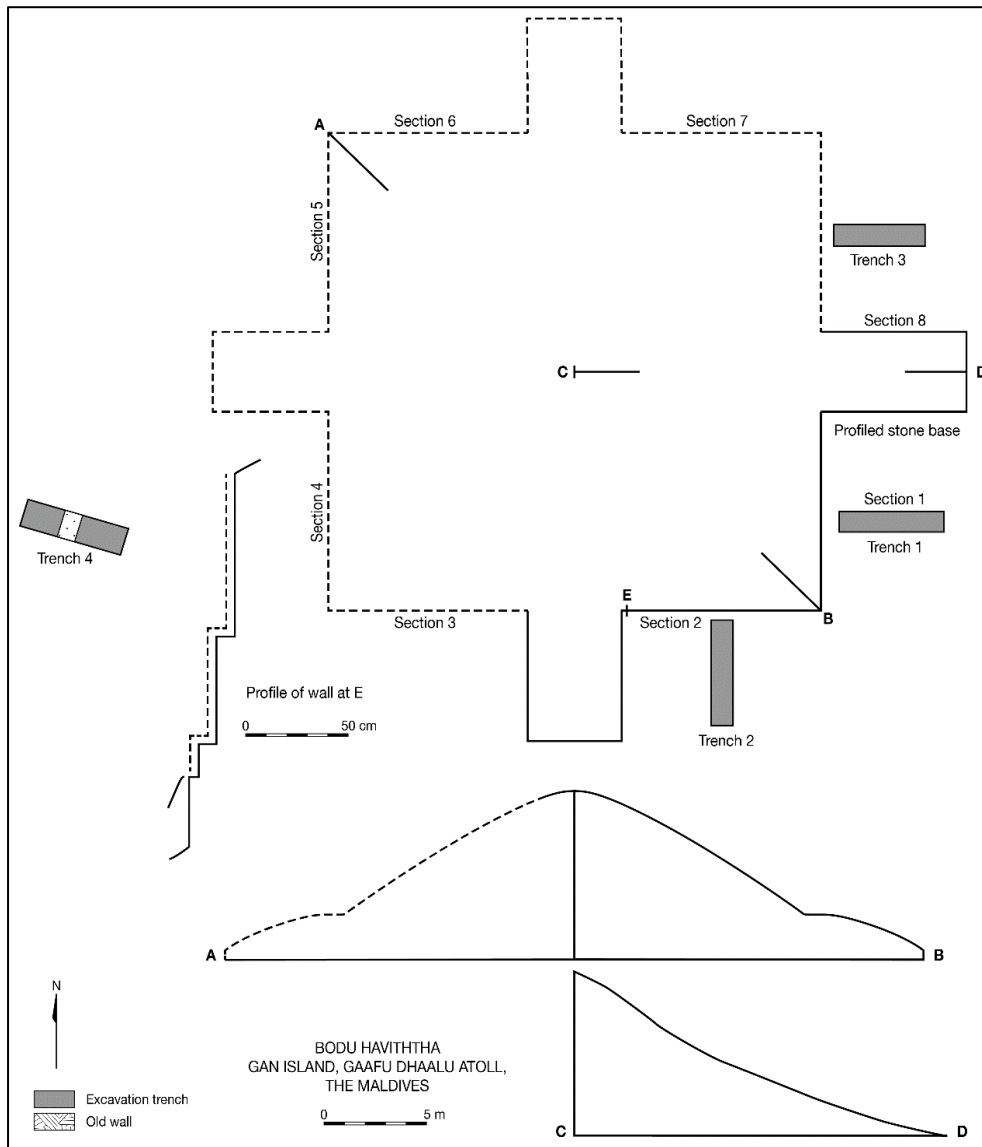


Figure 5.23 Site Plan and Profiles, Bodu Havitha.

Credit: After Skjølsvold 1991

5.6.2 Structural Features

The structural features include the four-sided *havitha*, which is square in shape, with four ramps located in the centre of each of the sides, and an outer enclosing wall (see Fig. 5.23). The fill of the *havitha* consisted of coral debris and blocks commingled with humus soil. Excavation was divided into eight sections and began on the eastern edge of the southern ramp (Section One), followed by the clearance of the wall. From this clearance the edges of the ramps were delineated and shown to be lined with limestone walls. The wall itself was badly damaged, owing to the pressure of the coral rubble and intentional destruction likely occurring at the introduction of Islam. The eastern wall (Section Two) was almost completely destroyed; however, the wall near the ramp was well preserved (Skjølsvold 1991:49). A coating of plaster covered the wall, in addition to there being a stone block with a depression for inserting a projection of some description. During this phase of excavation, 62 decorated and moulded stone fragments were discovered, originating from the structure itself. During 1984, Sections Three to Eight were uncovered. Section Three contained nothing ‘of note’ (Skjølsvold 1991). The wall of Section Four was cracked, which was likely the result of the collapse of the relic chamber (where the reliquary is traditionally located). The walls in Sections Five to Seven were badly damaged, whilst Section Eight was relatively well preserved.

The remains of an external wall were revealed in Trench Four, at XU2 (approximately 20cm deep), constructed of cut limestone blocks approximately 30 cm wide. The eastern edge was covered in plaster. The wall did not run parallel to the main *havitha*, and its location can be seen in Fig 5.23.

5.6.3 Summary of Non-Structural Material Culture Finds

Section One contained no non-structural material culture finds; however, Section Two contained many decorated and moulded stone fragments (n=65), likely belonging to the original *havitha* and a number of these (n=26) derived from the same decorative piece. An additional potential votive stupa was recovered, hypothesized to be made of topaz (Skjølsvold 1991:51). Section Three returned no finds. Section Four returned dentilated ornamentation and the excavation of Section Five recovered lion figures (n=2), one well-preserved and the other partially-preserved. A dome-shaped miniature stupa made of limestone was found in Section Six, in addition to a limestone block

(Skjølsvold 1991). The excavation of Section Seven resulted in several finds, including a probable railing stone, in addition to a rectangular stone slab displaying an ox figure. Additional limestone blocks decorated with circle motifs were recovered (n=2). A pedestal piece, likely belonging to a miniature stupa or the finial or spire of a relic and a ‘flattened ball’ with slightly asymmetrically placed spheres at two opposite sides, part of a bent knee and the sole of the foot of a ‘naturalistic’ Buddha figure and a semi-circular flagstone were recovered (Skjølsvold 1991). Near the ramp a square-based stone was recovered (approximately 35 cm long). The excavation of Section Eight revealed several limestone slabs with concentric circle decorations (n=2), including one with a copper spike insertion. A miniature ‘tower’ stupa and stupa finial were also recovered.

Table 5.10 Soil descriptions of adjacent trenches (details from Skjølsvold 1991)

Excavation Unit (XU)	Trench 1	Trench 2	Trench 3	Trench 4
Layer 1 (0-20cm)	Coral sand mixed with humus (grey-dark grey)	Coral sand mixed with humus (grey-dark grey)	Coral sand mixed with humus (grey-dark grey)	Coral sand mixed with humus (grey-dark grey) and some coral rubble in the middle of the trench
Layer 2 (20-30cm)	Dark coral sand mixed with humus and coral debris	Dark coral sand mixed with humus and coral debris	Dark coral sand mixed with humus and coral debris	Dark coral sand mixed with humus and coral debris
Layer 3 (30-40cm)	Greyish brown coral sand mixed with humus and charcoal	Dark grey coral sand mixed with humus, culturally sterile at 40cm.	Dark grey coral sand mixed with humus, culturally sterile at 40cm.	Dark grey coral sand mixed with humus, culturally sterile at 35 cm
Layer 4 (40-50cm)	Lighter coral sand and culturally sterile at 50cm			

The four trenches were excavated in 10 cm units and small quantities of material culture were recovered. The soil colour descriptors are not assigned by Munsell colour, and no samples exist to standardize this. Table 5.10 details the stratigraphy, and Fig. 5.23 indicates the trench location in relation to the *havitha* structure.

The material culture from Trench One included small undecorated earthenwares, a coral bead and a fishbone from XU2. Excavation of Trench Two resulted in the

recovery of 'human' remains in XU2 and XU3 (to be discussed in Chapter Seven); Trench Three returned fish bone from XU2. Ceramics were recovered in XU1 of Trench Four in addition to coral-stone rubble. XU2 revealed a wall of cut limestone blocks approximately 30cm wide, of which some sections were covered in plaster.

5.6.4 Discussion and Summary

One date was obtained from Bodu Havitha. This was derived from a bone sample recovered from Trench Two, which returned a calibrated date of 540–660 calCE (T-5577). However, issues associated with insubstantial bone collagen resulted in the rejection of the date (Skjølsvold 1991:64). Owing to the nature of the investigations and the lack of dates obtained, the proposed model for construction and occupation is based on relative phases. The nearby excavated cultural deposits are attributed to site occupation. The stratigraphy was uniform across all four excavated trenches (see Table 5.10) and the majority of the cultural material excavated was recovered from the lower excavation units. Faunal remains were found mainly in XU2–4. Additionally, ceramic material and beads were only recovered in the top two excavation units. The ceramic found during excavation at the site consists mainly of similar earthenware types abundant at Kuruhinna Tharaagadu and Nilandhoo Foamathi (quartz sand tempered earthenware). The only ceramic material definitively linked to the Islamic period was recovered from the surface (see Chapter Six).

The presence of an exterior wall awkwardly positioned adjacent to the *havitha*, recovered during the excavation of Trench Four, suggests that it was not contemporaneous with the main structure. However, as Skjølsvold (1991:64) posited, this may be a consequence of post-depositional disturbance and/or associated with the covering of the structures at the arrival of Islam. Subsequent growth of coconut trees would have significantly impacted on the integrity of the internal structure. This damage can be seen on the exterior walls discussed in the 'structural features' section.

It is therefore proposed that the *havitha* was constructed during the Buddhist phase, which was followed by a probable second building phase as evidenced by the recovery of the adjacent wall feature recovered in XU 2 of Trench Four. These were both constructed prior to the covering of the site during the Islamic period. The artefacts and bone from the excavated trenches are likely associated with the site occupation as

most were recovered from XU2–XU4, unless post-depositional factors resulted in their vertical movement throughout the profile. However, the low quantities of definitive materials manufactured during the more recent Islamic period support their association with the earlier Buddhist occupation.

5.6.5 *The Archaeology of Dhadimagi Havitha*

Dhadimagi Havitha was initially investigated by Bell in 1922 and by Maniku in 1946, who recovered three coral stone caskets (Bell 1940:110,126; Waheed 2003:54). Several adjacent features were also investigated, including the Buddhist period ceremonial bath. The site is located on Fuvamulah Island (see Fig 5.24). Fuvamulah contains the only freshwater lakes in the Maldives, Dhadimagi (Dhandimagu) Kilhi and Bandaara Kilhi (Water Solutions Pty Ltd 2008). The site is located on the north-eastern side of the island, on the periphery approximately 136 m from the shoreline. The site was covered with debris and vegetation, and a short survey and clearing of the *havitha* was undertaken during the NMI in 1983, which subsequently resulted in a one-day investigation in 1984. In addition to the clearance of this *havitha*, the westward side of the area was excavated, to further investigate the extent and nature of the construction (see Fig. 5.26 for Site Plan and Fig. 5.27 for site photo; Skjølsvold 1991). These adjacent excavations were conducted in 10 cm spits, and were excavated to a total depth of 30 cm. The adjacent bath was excavated as one unit. It is from the adjacent excavation trench that most cultural material was recovered from these investigations.

5.6.6 *Structural Features*

The obvious structural feature, includes the uncovered *havitha* (see Fig. 5.25). The base circumference of the *havitha* was 70.1 m, and the height approximately 18.2 m. Clearance of the vegetation revealed limestone blocks, however none of these blocks were decorated or dentilated and they were previously plastered. Beach boulders acted as a ‘crude stairway’ (Skjølsvold 1991). The remains of four previously terraced walls were associated with the *havitha*. A bath structure was also recovered (see Fig 5.25 and 5.26).

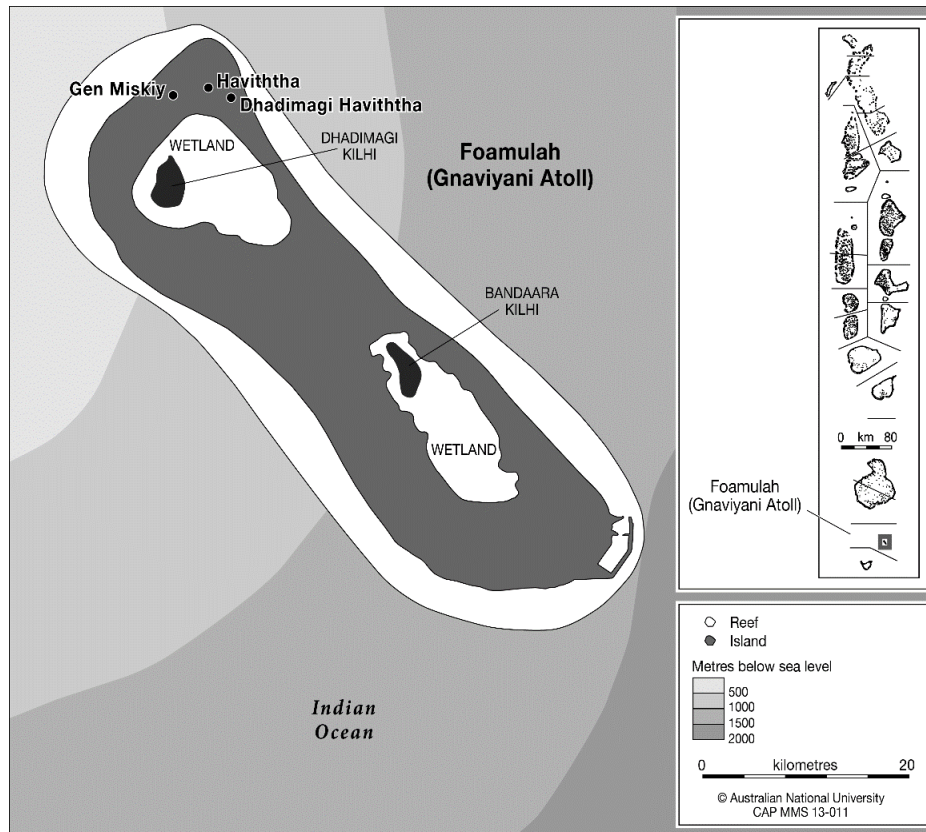


Figure 5.24 Dhadimagi Havitha/Haviththa, Gnaviyani Atoll

Credit: After Skjølsvold 1991



Figure 5.25 Dhadimagi Havitha

Credit: Kon-Tiki Museum

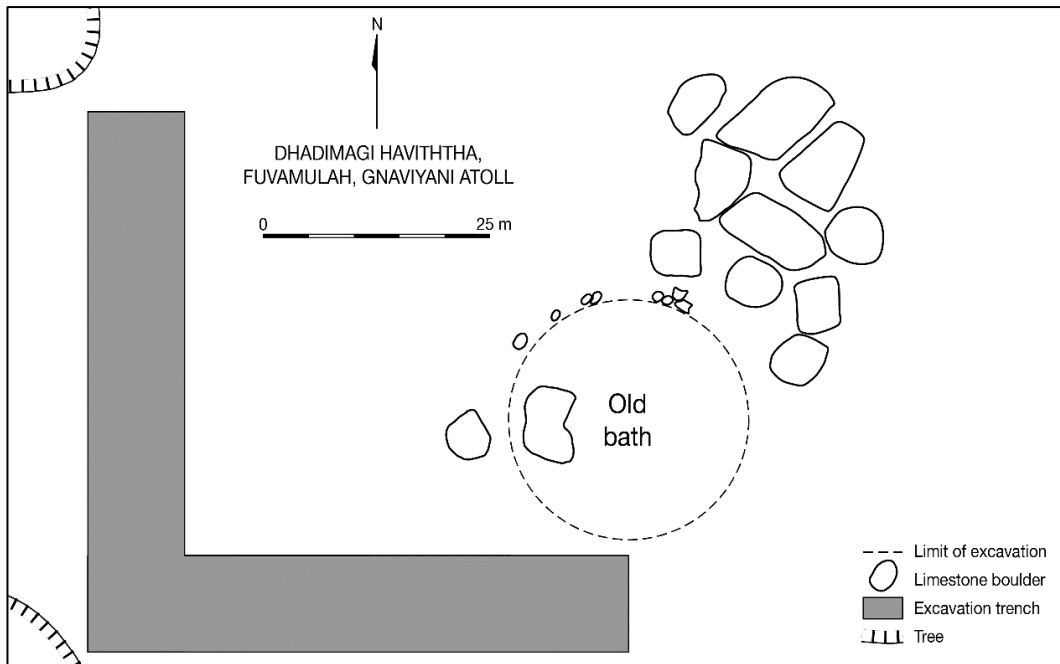


Figure 5.26 West of Dhadimagi Havitha, Site Plan, Gnaviyani Atoll

Credit: After Skjølsvold 1991



Figure 5.27 Adjacent to Dhadimagi Havitha

Credit: Kon-Tiki Museum

5.6.7 Summary of Non-Structural Material Culture Finds

The artefactual finds from the very limited excavations at the site on Fuvamulah Island are largely derived from the features adjacent to the *havitha*. These included material that can be linked to the more recent Islamic period (i.e. a copper bracelet and particular tradewares manufactured during this period). Faunal material was also recovered from the excavation trench; however, was constrained to the first excavation unit. This material consisted of fish, with a relatively large proportion of the cartilaginous fish types—sharks and rays. Interestingly the vertebrae elements were significantly larger than those recovered from excavations in the north and central sites. Ceramics of the type present at all other sites mentioned above (i.e. quartz-sand tempered earthenwares) were also present throughout the excavation trench.

5.6.8 Discussion and Summary

No radiocarbon dates were returned from the excavation of Dhadimagi Havitha and therefore what can be said for these investigations is limited to relative chronologies. The *havitha* was constructed during the Buddhist period and was likely covered at the arrival of Islam during the twelfth century. The adjacent bath can also be assigned to this phase (being of the type associated with Buddhist structures in the Maldives, such as that found at Nilandhoo Foamathi). However, when the cultural materials associated with the excavation trench were deposited is unknown. The excavation lacks material that can be clearly linked to this earlier ‘Buddhist’ phase; however, definitively ‘Islamic period’ material was also recovered from the uppermost spits. The faunal remains were also found in the uppermost spits, in association with these more recent materials. They consisted mainly of larger sharks and/or rays (see Chapter Seven for a detailed analysis of the faunal remains).

5.7 Conclusion

This chapter detailed the two larger Norwegian investigations (the NMI and UOI) which were conducted in 1983–1984 and 1995–1997 and are analyzed in this research. The sites were described and detailed and a refined chronology and new site formation models were outlined.

All excavated sites correspond with the known early Buddhist occupation period, with *havitha* structures targeted for investigation. The excavated sites illustrated multiple

building phases in addition to later use during the Islamic period. The presence of material culture definitively linked to this later period (owing to known historical manufacture dates) highlights multiple phases of site use. The use of *havitha* coral-stones in later Islamic structures on Nilandhoo Island, illustrates a tangible reuse.

The earliest dates obtained from a Maldivian site were from the refuse deposit (Feature Four) at Nilandhoo Foamathi. This date was derived from a *Cocos nucifera* charcoal sample and ranged from 249–393calCE (95.4%) (Wk-30394). The fill from the *havitha* (Feature One) was dated to the historically known Islamic period, providing good insight as to when this site was covered: 1170–1496 calCE (95.4%) (T-5575). This date is very close to the historically known introduction of Islam (1153AD). The earliest date from Kuruhinna Tharaagadu was 345–604 calCE (95.4%) and was derived from an unidentified charcoal sample. This sample was obtained from a post-hole associated with Feature 18 (TUa-1884). The two southern sites were not dated, and consequently relative phases have been established to discuss the site formation and occupation.

Faunal material was present at all sites. The majority of material returned included fish bone, which supports known ethnographic information concerning subsistence practices amongst the *Divehi*. These remains were recovered from the Buddhist and Islamic periods, although chicken and rat were also recovered. Kuruhinna Tharaagadu and Nilandhoo Foamathi also saw the ritual and practical use of faunal remains. Caches of cowry at Kuruhinna Tharaagadu and Nilandhoo Foamathi suggest both processing and hoarding, from the Buddhist period through to the end of the known cowry processing period. Modified shell was recovered from early layers at Nilandhoo Foamathi in addition to modified *Elasmobranchii* vertebrae. Quantities of land tortoise, marine turtle and ?*Aldabrachelys gigantea* bones were also recovered from Kuruhinna Tharaagadu in significant locations. A ubiquitous presence of quartz-sand tempered earthenware, described as ‘red ware’ in previous investigations is clear (see Chapter Six). Additional later period Chinese trade wares were present at the sites, in addition to pottery manufactured during the historically accepted Islamic period. These later types tended to be confined to the more recent layers; however, the next chapter outlines in detail the ceramic material recovered from these sites and includes the analytical methodology and results.

6

Ceramics

6.1 Introduction

Studies of ceramic assemblages from the Western Indian Ocean are integral to an understanding of early trade in the region and are often used to supplement early literary accounts. Likewise, the aim of the ceramic analysis in this research is to understand interaction networks between the Maldives and other Indian Ocean communities from the start of human settlement into the period post-1153 CE. Understanding the timing and extent of trade, migration and transport systems/networks is crucial for establishing early globalizations and to do so it is necessary to examine exogenous material culture from dated contexts. In this case, ceramic material culture is an especially fruitful line of evidence to interrogate as the Maldives are exclusively coralline and do not contain clay sources suitable for pottery manufacture—as such all ceramics present at sites were imported to the islands from external sources. An analysis of ceramic material culture will not just provide insight into trade networks and systems, but also into the use of the ceramics in their new Maldivian context.

This chapter describes the ceramic finds from excavated sites and surface scatters presented in the previous chapter. To date, no detailed analyses of ceramic assemblages from archaeological sites in the Maldives have been forthcoming. The ceramics in this study were analyzed at varied intensities, with the entire assemblage recorded from Nilandhoo Foamathi, Bodu Havitha, Dhadimagi Havitha and the NMI surface assemblages; however only a sample from Kuruhinna Tharaagadu was analyzed due to limited access to the collection.

6.2 Ceramics in the Maldives

Chapter Four outlined the limited ceramic finds in the Maldives and identified previous studies including Carswell's (1976) assessment of ceramics from undated contexts in Male' and Mikkelsen's preliminary sequence of the ceramics from Feature

Four, Nilandhoo Foamathi (Skjølsvold 1991). Mikkelsen (2000) also provided a preliminary description of the ceramics from Kuruhinna Tharaagadu and the Archaeological Survey of India (ASI) reported on the presence of similar earthenware and Chinese porcelains recovered during other investigations (Bopardikar 1992).

The ceramics represented in the Maldives and the Lakshadweep include earthenwares, that are particularly friable and prone to breakage and are of a likely Indian provenance—these have been termed ‘red-wares’ in studies of the Lakshadweep and the surveys conducted by the ASI throughout the Maldives during the 1980s (Bopardikar 1992; Tripathi 1999). Northern Black Polished Ware has also been reported from Androth Island in the adjacent Lakshadweep (Rao *et al.* 1995). Chinese ceramics have been reported in previous analyses, including at Nilandhoo Foamathi in more recent layers from Feature Four (Skjølsvold 1991). Excavations at Kuruhinna Tharaagadu recovered larger quantities, mainly consistent of Longquan Celadon (Mikkelsen 2000). The surveys in Male’ by Carswell (1976) and the surveys by the ASI during 1986–1987 also found Longquan Celadon and Chinese Porcelain from Landhoo Island, North Male’ Atoll (Bopardikar 1992:176). Carswell documented Sasanian-Islamic Ware in Male’, from an undated context (Carswell 1976).

6.3 Ceramic Analytical Methodology

The ceramic analytical methodology employed in this thesis, was borrowed from those used to study Western Indian Ocean assemblages by Kennet (2004), Reddy (2013) and Saunders (2013). All studies emphasize the need to identify (i.e. provenance and date) samples and attribute the sherds to standardized ‘ware families’ and ‘wares types’. These are assigned per an assessment of morphology and fabric and then are classified into larger ceramic traditions, such as Sasanian-Islamic Ware, Indian Red Polished Ware and Northern Black Polished Ware. Kennet (2004:33) describes a ‘ware class’ as a ‘group of pottery with consistently similar characteristics’. Fine-wares from India and China tend to be more easily identified to type as they have been well-studied and have distinctive morphologies (Begley and Tomber 1999). However, the Indian coarse-wares have not been extensively classified into particular ware classes and families, as they are utilitarian vessels, which are not as well studied as the decorative prestige vessels from the fine-ware traditions of India and China. The Indian coarsewares are also present for a particularly long period—through to the present—

and are widely distributed throughout the Indian Ocean, having been reported from Arabia to Southeast Asia (Tomber 2008).

Identifying ware types in this research made this study consistent with other Indian Ocean research. Although a major issue with Western and Central Indian Ocean ceramic analyses is a lack of detailed attribute recording i.e. rim diameter, body thickness and sherd weight (Saunders 2013). To remedy this a number of attributes were recorded to better characterize the assemblage, this followed Rice (2005) and included: ceramic form and function (where possible), sherd traits, decoration series, colour and a preliminary fabric analysis. These results aren't quantified in this chapter, but discussed where relevant.

The material was first excavated and cleaned in the Maldives. The ceramics recovered from the UOI were transported to the Culture-History Museum at the University of Oslo in Norway. Pottery from the NMI was transported back to the Kon-Tiki Museum in Oslo, Norway. As aforementioned, an initial preliminary analysis of the sherds from Nilandhoo Foamathi was conducted by Mikkelsen in the 1990s, when he provided counts of sherds per excavation unit (Skjølsvold 1991). Mikkelsen also provided a summary of the sherds recovered from Kuruhinna Tharaagadu during the UOI in the 1990s (Mikkelsen 2000).

The results presented in this thesis, were recorded in Norway in 2010 by Mirani Litster. Ware identification was completed at the Australian National University by Mirani Litster and further assistance in identifying ware types was provided by Aedeen Cremin (University of Canberra), Baoping Li (Sothebys London, University of Sydney), Heidrun Schenk (German Archaeological Institute), Adria LaViolette (University of Virginia) and Leonard Cox (University of Sydney). Samples of the ceramic assemblages were taken from the Norwegian repositories for further analysis at the Australian National University by Mirani Litster. Litster conducted a preliminary fabric analysis in the Department of Archaeology and Natural History's ceramic laboratory. All drawings in this thesis have been completed at the Australian National University from photographs taken in Oslo, Norway, unless otherwise indicated.

6.3.1 Ware Families and Type

The overarching classification used was the ‘ware family’. The sherds were classified into these larger groups initially. They include: Far Eastern Wares (FE), South Asian Wares (SA), Western Asian Wares (WA), and Unknown (UNK) (after Kennet 2004; Reddy 2013 and Saunders 2013). See Table 6.1. The ceramics were then separated into ‘ware types’ where recognized and were assigned a specific code, mostly derived from Kennet (2004). For a full list of identified wares recovered during the NMI and UOI see Table 6.2 for ware, corresponding code (adapted from Kennet 2004, who refers to them as ‘class’), and description.

Table 6.1 Ware Families from Maldivian Assemblages (Adapted from Kennet 2004; Reddy 2013; Saunders 2013)

Ware Family	Code	Description
Far Eastern	FE	<i>Far Eastern (FE)</i> includes all Chinese ceramics; during the first and second millennium CE. These have a distribution range of the entire Indian Ocean region (Saunders 2013).
South Asian	SA	<i>South Asian (SA)</i> as a ware family, includes earthenware and fineware (Kennet 2004; Reddy 2013). This includes ceramics from both India and Sri Lanka. SA wares have been recovered from contexts throughout the Indian Ocean (Saunders 2013).
Western Asian	WA	<i>Western Asian (WA)</i> includes all ceramics from the Gulf and the Red Sea areas.
Unknown	UNK	Any unknown ceramics fall under this category.

Table 6.2 Identified Ware Types present in Maldivian Assemblages (After Kennet 2004; Reddy 2013; Saunders 2013)

Ware Family	Ware Type	Code	Description	Source and Distribution
EA	Longquan Celadon	LQC	<i>Longquan Celadon</i> is defined as having a 'good quality, light grey stoneware body covered in a thick green glaze that often crazes very finely' (Kennet 2004).	LQC was made in <i>China</i> (Krahl 1986). This was widely exported to the Western Indian Ocean, the Near East and to the Mediterranean among other regions (Kennet 2004:64).
SA	Paddle-Imprinted Ware	PIW	Paddle Imprinted ware, includes earthenware vessels decorated by grooved paddles.	Paddle impressed pottery is known to occur in <i>South India</i> during the early historic period (Selvakumar 2011:202; Pavan and Shenk 2012:197). It is still a technique used in Southern India today, particularly in the area near Arikamedu, from where these vessels were originally shipped.
	Northern Black Polished Ware	NBPW	Northern Black Polished Ware was potted on a wheel, and made of a fine, well-levigated clay, with little tempering. It has a glossy surface (Haque <i>et al.</i> 2001).	Northern Black Polished Ware is typically thought to have been manufactured in the Ganges region of <i>northern India</i> during the latter half of the first millennium BCE through to the BCE/CE transition. These wares have been found distributed through Bangladesh, India, Pakistan, Nepal, Sri Lanka, Arabia, Southeast Asia and the Lakshadweep (Sharmin and Okoda 2011).
	Indian Red Polished Ware	IRPW	Indian Red Polished Ware 'has a fine, well-levigated, brick-red body covered by thin orange-red slip, which is often burnished. This fracture is smooth, with no visible inclusions. Mica is visible on the surface' (Kennet 2004:88)	The archaeological distribution of Indian Red Polished Ware in India covers <i>central and northern India</i> , with a likely production area of Gujarat (near the region of Amreli) (Pinto Orton 1991). The earliest dates for Indian Red Polished Ware (IRWP), date to the first century AD (Kennet 2004:88).

Ware Family	Ware Type	Code	Description	Source and Distribution
WA	Sasanian-Islamic	TURQ	<p>Sasanian Islamic Ware is covered with an alkaline glaze that varies in colours ranging from yellow to green to turquoise. The clay varies, is grainy and is usually of the Munsell colour 2.5 Y 8/4 (Kennet 2004:36).</p> <p>Vessels are typically small, such as bowls although can include large jars (Kennet 2004:36).</p>	<p>Sasanian Islamic Ware is thought to be manufactured near Basra in <i>Southern Iraq</i>, although it is likely that other potential production areas existed (Kennet 2004:36).</p> <p>The ware is present on sites in the Indian Ocean ranging from the Gulf, East Africa, South Asia and Japan (Kennet 2004:36).</p> <p>Sasanian-Islamic Ware was produced by at least the third century BCE in the Gulf, but earlier in Mesopotamia (Kennet 2004:36).</p>



PIW: Paddle Impressed Ware
(Kuruhinna Tharaagadu)



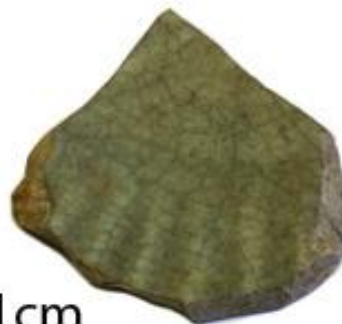
IRPW: Indian Red-Polished Ware
(Nilandhoo Foamathi, Surface)



NBPW: Northern Black Polished Ware
(Nilandhoo Foamathi, Surface)



TURQ: Sassanian-Islamic Ware
(Bodu Havitha, Surface)



LC: Longquan Celadon
(Kuruhinna Tharaagadu)

Figure 6.1 Examples of Ceramic Ware Types in the Maldives
Credit: Mirani Litster and Michelle C. Langley

6.3.2. *Form and Function*

Form and function were classified and recorded where possible. It was essential to group the vessels into categories that were compatible with the ceramic morphologies used previously in Indian Ocean research (Reddy 2013). Therefore, the terminology includes the terms *handis*, bowls, lids, jars and lamps. These were not broken down into further sub-forms, as the nature of the assemblage proved too fragmentary and the overall vessel shape or ‘form’ was unable to be ascertained in many instances.

Table 6.3 *Inferred Function (from Rice 2005:238)*

Functional Category	Shape	Material	Surface Treatment and Decoration	Frequency	Clues
Storage Vessel (S)	Restricted forms, orifice modified for pouring or closure. Appendages for tipping or movement	Variable (often concern for low-porosity)	Variable; slip or glaze apparent to reduce permeability	Low (low replacement); may be reuse of broken or old vessel	Residues of stored materials
Cooking pots (C)	Rounded, conical, globular, unrestricted, generally lacking angles	Coarse and porous, thermal shock resistant	Little to none; surface roughening for handling ease	High (frequent replacement)	Exterior sooting or blackening; burned contents
Food preparation (without heat) (FP)	Unrestricted form, simple shapes	Mechanically strong; dense	Variable, generally low	Variable	Internal wear; abrasion or pitting
Serving (S)	Unrestricted for easy access; often with handles; flat bases or supports for stability	May be fine	Generally high	High (frequent use and replacement)	Sizes correspond to individual servings or group size
Transport (T)	Convenient for stacking; handles; lightweight; restricted orifice	Emphasis on mechanical strength, dense, hard	Variable, generally low; slip or glaze to reduce permeability	Variable	Uniform size or multiple units of size; residues of contents

Suggested ceramic function was also recorded, as it has been noted in many studies of Indian Ocean ceramics (Kennet 2004; Saunders 2013). The following categories were assigned after Rice (2005), including: (S) Storage, (C) Cooking, (FP) Food Preparation, (S) Serving and (T) Transport (see Table 6.3).

The form/function relationship has been long discussed in pottery analysis, and often relies on ambiguous categories, but can be more broadly termed as ‘interactions between morphology, or structural characteristics, and functional roles’ (Rice 2005:211). Here these functional categories are based on the following criteria, although are considered to only be an inferred function.

6.3.3 *Sherd Attributes*

Sherd type was recorded. This included sherds from the orifice, body and base. See Fig 6.2 for outline of different parts of the vessel from where sherd types have derived, which include: (R) Rim, (B) Body, (Sh) Shoulder, (N) Neck, (C) Collar, (T) Throat, (L) Lid, (H) Handle, (U) Undiagnostic, (Ba) Base; and (C) Complete (after Rice 2005; Saunders 2013).

Additional attributes included: the weight of each individual sherd—this was recorded and measured to the closest 0.1 g. Sherd thickness was recorded. On rim pieces this measurement was taken from two places, *Measurement A* was recorded on the rim, whereas *Measurement B* was on the body immediately below. Sherd thickness from body sherds involved one measurement.

A focus on rim form was included in the recording phase having been shown to be a ‘significant tool in regional ceramic analysis’ in Western Indian Ocean studies owing to distinctive rim forms present (Saunders 2013).

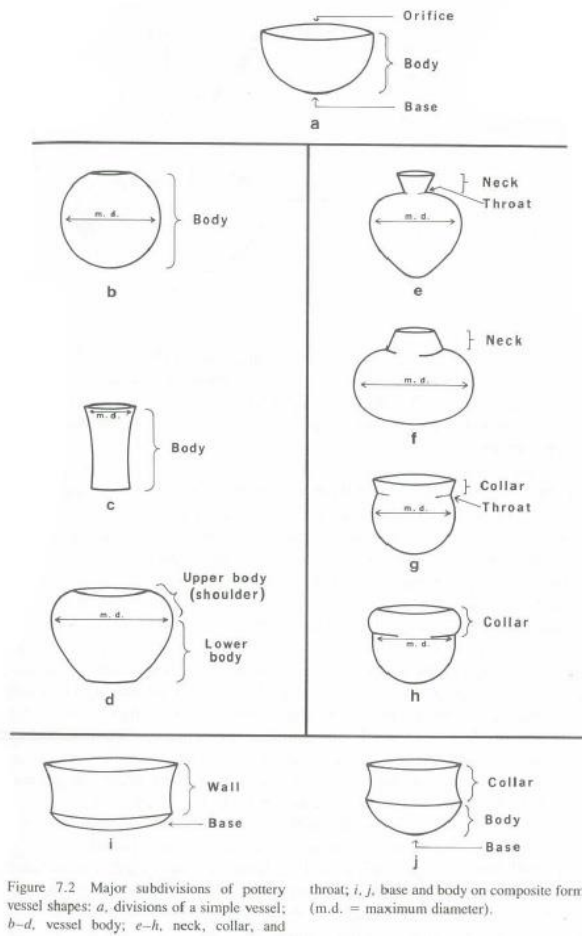


Figure 6.2 Pot form and features

Credit: from Rice 2005:213

The following rim and lip measurements were recorded (from Bedford 2006):

- 1) Rim-direction: This recording is determined from a 'perpendicular central axis running down the centre of the original pot, which is combined with the placing of a horizontal surface on the lip which enables finer calibration of the rim angle in relation to the central axis' (Shephard 1963:256). The different categories included; (a) direct (b) incurving (3) inverted (4) outcurving and (5) everted.
- 2) Rim Profile: This is the 'relationship between the inner and outer walls of the rim as they proceed to the lip'.

- 3) Lip Profile: The lip is the very top edge of the vessel and is classified as (a) *plain or rounded*—convex profile, b) *pointed*—sharp point (c) *flat*—straight or (d) *flat horizontal*—same as ‘flat’ but the lip surface lies on a horizontal plane.
- 4) Rim Radius: A radius template was used to record the original radius on all rim sherds with a lip; however, for this measurement to be considered reliable, the rim sherd needed to measure approximately 4–5 cm.
- 5) Rim Profiles:

Table 6.4 Rim profile classifications (from Bedford 2006:77)

Rim Profile Classification	Definition
Parallel	Little perceptible change in rim profile towards the lip
Convergent	Rim profile thins towards the lip
Divergent	Rim profile thickens towards the lip

6.3.4 Decoration and Decoration Series

Several attributes concerning decoration were also recorded (after Orton and Hughes 2013) and included:

- 1) Decoration location was sub-divided into the categories: (R) Rim, (B) Body, (Sh) Shoulder, (N) Neck, (C) Collar, (T) Throat, (L) Lid, (H) Handle, (U) Undiagnostic and (Ba) Base.
- 2) Surface modification was also recorded for earthenware and was modified from Orton and Hughes (2013:89) and Bedford (2006) and included the following categories: (C) Combing, (I) Impressed, (G) Grooving, (I) Incision, (B) Burnishing, (A) Applied and (R) Rouletting.
- 3) Surface applications included (G) glazed or (S) slipped.

A decoration series was also established for Indian Wares (SA). These were established in an ‘unstructured’ manner, where each additional type was added as it appeared in the analysis, until all decoration types were established across all the Maldivian assemblages.

6.3.5 Colour

Colour was another category recorded and Munsell numbers were used to standardize this recording. Colour measurements were recorded for both the surface and the core.

Any glazes or decoration were recorded as an additional sub-category. Rice's (2005:345) classification of colour types and original firing conditions were also used, although refiring would be recommended as a further avenue of research to confirm these tentative classifications.

Table 6.5. Fired Colour and Firing Conditions (from Rice 2005:345)

Colour		Probable Firing	Comment
Surface	Core		
Clear colours; identical across both sections		Relatively well oxidized	No evidence of original state of clay with respect to the carbon content; colour development due to iron
Brown	Brown	Incomplete to relatively well oxidized	May be lightly smoked or smudged paste. Refiring in oxidation will clear colours.
Clear or Light Grey	Light to Dark Grey	Incomplete oxidation	
Light grey	Light grey	Incomplete oxidation or reduction	
Dark grey or black	Dark grey or black	Reduced or smudged	May be highly carbonaceous clay or heavily smudged
Dark grey or black	Light grey	Smudged	Carbon deposited on surface during end of firing; lighter core indicates it was not an organic clay. Refiring may clarify colours.
White	White	Uncertain	May be clay lacking in both iron and organics. Refire in oxidation to note any colour development.

6.3.6 Fabric Analysis

Litster conducted a preliminary fabric analysis, which involved sectioning sample sherds with a gem saw and examining them under low-power magnification. Non-plastic and plastic components were classified. Light coloured inclusions were tested with 10% HCl to determine if they were calcareous. Temper type (non-plastic) was classified and a description of the plastic inclusion was provided. These were assigned a relevant code, see Table 6.6.

Table 6.6. Non-plastic inclusion classifications, based on preliminary classification under low-powered magnification (Mirani Litster)

Non-Plastic Inclusion Code	Description
Q	Quartz Inclusion
G	Grog
C	Calcareous Inclusion
M	Micaceous Temper

6.4 Results

The major results collected by Litster are presented here. Initial total counts and weights are presented which is followed by more detailed individual sections on surface finds and then on the assemblages obtained from the excavation of Kuruhinna Tharagaadu, Nilandhoo Foamathi, Bodu Havitha and Dhadimagi Havitha. These include, total sherd counts and weights, both by context and across temporal phases. This is followed by detailed breakdowns of ware families and types per site across contexts and phases.

6.4.1 Total counts and weights

The total sherd count and weights for pottery assemblages throughout the Maldives, can be seen in Table 6.7.

Table 6.7. Absolute Quantities of Ceramic Sherds from Maldivian Assemblages (Counts and Weights) (Mirani Litster)

Site	Total Sherd Count (n=)	Total Sherd Weight (g)
Kuruhinna Tharaagadu	18	737.9
Nilandhoo Foamathi	1180	7742.3
Bodu Havitha	40	389.8
Dhadimagi Havitha	423	3474.3
Surface Finds from Surveys	8	279.0

The largest quantity of ceramics returned from any archaeological investigation in the Maldives to date, has been from Mikkelsen's excavations at Kuruhinna Tharaagadu (estimated at more than 30 kg), although only a minimal sample could be used in this analysis (n=18, wt=737.92 g). The remaining assemblages were not sampled but recorded in total. Nilandhoo Foamathi contained the second largest assemblage

(n=1180, wt=8994.34 g). Dhadimagi Havitha in Gnaviyani Atoll was the third largest (n=425, wt=3476.24 g), Bodu Havitha followed with smaller amounts (n=40, wt=389.76 g). Surface finds were also recorded from surveys, including those found at Taddhoo Island, Vadhoo Island and Baa Atoll (n=8, wt=279 g).

6.4.2 Kuruhinna Tharaagadu Ceramic Assemblage

The largest proportion of ceramic material was excavated from the north-central site of Kuruhinna Tharaagadu; however, only a sample was recorded in this research owing to time constraints and access to the collection. The quantities of this sample are outlined in Table 6.8 and 6.9. The East Asian Wares formed the largest portion of the sample (n=3) with manufacture dates suggested to range from the twelfth to seventeenth century (Baoping Li pers. comm. July 2015)

Table 6.8 Sample of Ceramic Sherds, Kuruhinna Tharaagadu (Mirani Litster)

Context	XU	Sherds (n=)	Weight (g=)
X90/y100	1	1	21
X85/y120	1	1	44
X110/y125	1	2	76.12
X80/y115	1	1	32
Feature 12	1	6	112.4
Feature 10	1	2	113.4
Feature 15	1	3	119.0
Feature 17	1	2	220.0
TOTAL		18	737.92

Table 6.9 Ware Families of Ceramic Sample from Kuruhinna Tharaagadu (by count) (Mirani Litster)

Context	XU	East Asian	South Asian
X90/y100	Surface	0	1
X85/y120	Surface	0	1
X110/y125	Surface	0	2
X80/y115	Surface	0	1
Feature 12	1	6	0
Feature 10	1	2	0
Feature 15	1	3	0
Feature 17	1	2	0
TOTAL		13	5

The East Asian wares were all serving vessels, with several dishes present (see Fig. 6.3). Five sherds of PIW were sampled from the surface of the site (see Table 6.9), all decoration was IND2 (see Table 6.13).

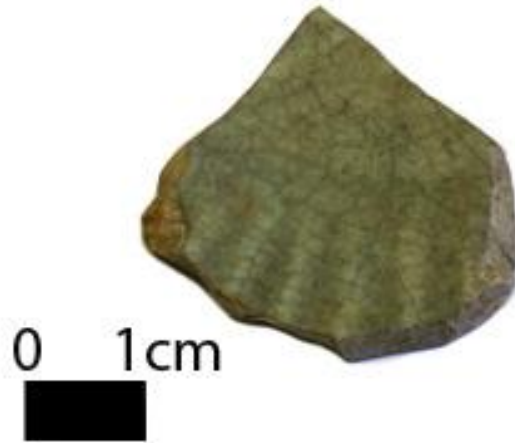


Figure 6.3 Longquan Celadon, Kuruhinna Tharaagadu

Credit: Mirani Litster

6.4.3 Nilandhoo Foamathi Ceramic Assemblage

The excavation of Nilandhoo Foamathi involved the identification of several different features and surface materials. The descriptive results from Nilandhoo Foamathi can be seen below. The count from different excavation units and contexts can be seen in Table 6.10.

The sherds returned from the excavations at Nilandhoo Foamathi totalled 1180 individual sherds with a collective weight of 7742.3 g. The majority of these sherds were recovered from the excavation of Feature 4. Feature 1 returned one sherd, whilst the surface scatter consisted of 150 sherds; however, it corresponded to the highest weight of sherds (4953.84 g). Feature 4 had the largest sherd count (n=1029), with a lower weight than the surface scatter (2744.5 g). See Table 6.10.

The different sherd types by context can be seen in Table 6.11. This was dominated by those falling into the undiagnostic category. Followed by rim sherds, body sherds, bases, throats and shoulders.

Table 6.10 Absolute Sherd Quantities at Nilandhoo Foamathi and Corresponding Dates (Mirani Litster)

Context	XU	Section	Sherds (n)	Weight (g)	Corresponding Dates
Surface	Surface		150	4953.8	Post-1153 AD
Feature 1	Surface		1	44	Post-1153 AD
Feature 4	1		17	355	
	2		64	167	775-968 cal AD
	3		35	38	
	4		14	4.5	1660-modern
	5		0	0	
	6	C	16	56	
	7	A	259	751	
	7	C	61	108	
	8	A	63	296	776-975 cal AD
	8	C	76	255	
	9	A	5	8	
	9	B	194	312	552-647 cal AD
	9	C	14	26	
	10	A	8	4	
	10	B	152	224	
	10	C	9	14	
	11	B	39	124	249-393 cal AD
	11	C	3	2	389-866 cal AD
TOTAL			1180	7742.3	

Table 6.11 Absolute Quantities of Sherd Type Across Contexts (Mirani Litster)

Context			Rim	Body	Shoulder	Throat	Base	Undiagnostic	Total (n=)
Feature	XU	Section							
Surface	Surface	Surface	81	26	1	5	4	33	150
1	Surface			1					1
4	1		5	3				9	17
3	2		3	3				58	64
	3		2	1	1			31	35
	4			2				12	14
	6	C	1					15	16
	7	A	3	19				237	259
	7	C		1				60	61
	8	A	1					62	63
	8	C	1	3				72	76
	9	A						5	5
	9	B		3				191	194
	9	C						14	14
	10	A						8	8
	10	B		5				147	152
	10	C						9	9
	11	B	2	1				36	39
	11	C						3	3
TOTAL			99	68	2	5	4	1002	1180

Table 6.12 Absolute Quantities of Ware Families Across Contexts (Mirani Litster)

Context			Far Eastern	Western Asian	South Asian	Glazed Wares	Total
Feature	XU	Section					
Surface	Surface	Surface	5	2	138	5	150
1	Surface				1		1
4	1				17		17
3	2				62	2	64
	3		1		33	1	35
	4				14		14
	6	C			16		16
	7	A			259		259
	7	C			61		61
	8	A			63		63
	8	C			76		76
	9	A			5		5
	9	B			194		194
	9	C			14		14
	10	A			8		8
	10	B			152		152
	10	C			9		9
	11	B			39		39
	11	C			3		3
TOTAL			6	2	1164	8	1180

The surface context returned the greatest diversity of ware families, with four represented including: South Asian Wares, East Asian Wares, Western Asian Wares and Glazed Wares. Layers Two and Three of Feature Four also contained a larger diversity of ware families; however, all other features excavated returned only South Asian Wares.

The bulk of Far Eastern Wares were recovered from the surface scatter, with five sherds constituting 0.42% of the total sample. Three of the five sherds were ware types from the early-mid Qing to late Qing periods (1600s–1900s), with a manufacture period that correlates to their more recent context at the site (post-1153), with one surface find likely belonging to the earlier Song period (Schenk pers. comm. July 2015). One vessel was manufactured intended for export (see Fig. 6.4), and all forms represented either bowls or plates, with a serving or decorative function.



*Figure 6.4 Late-Qing. Export Ware, for the Straits of China Markets
Nilandhoo Foamathi, Surface Find
Credit: Mirani Litster*

The Western Asian wares were minimal in the sample, constituting only 0.16% of the total assemblage, with two sherds recovered from the surface scatter and therefore deposited after 1153 CE. The first was a buff sherd with a green glaze of likely Sasanian-Islamic origin (see Fig 6.5). The second was a white glazed rim fragment of a bowl, with a blue and gold glazed dotted design (Leonard Cox pers. comm. May 2014). The white glazed piece formed the rim of a bowl, whereas the Sasanian-Islamic sherd potential belonged to either a dish or a bowl, owing to the internal and external glaze present on the fragment (Heidrun Schenk pers. comm. July 2015).

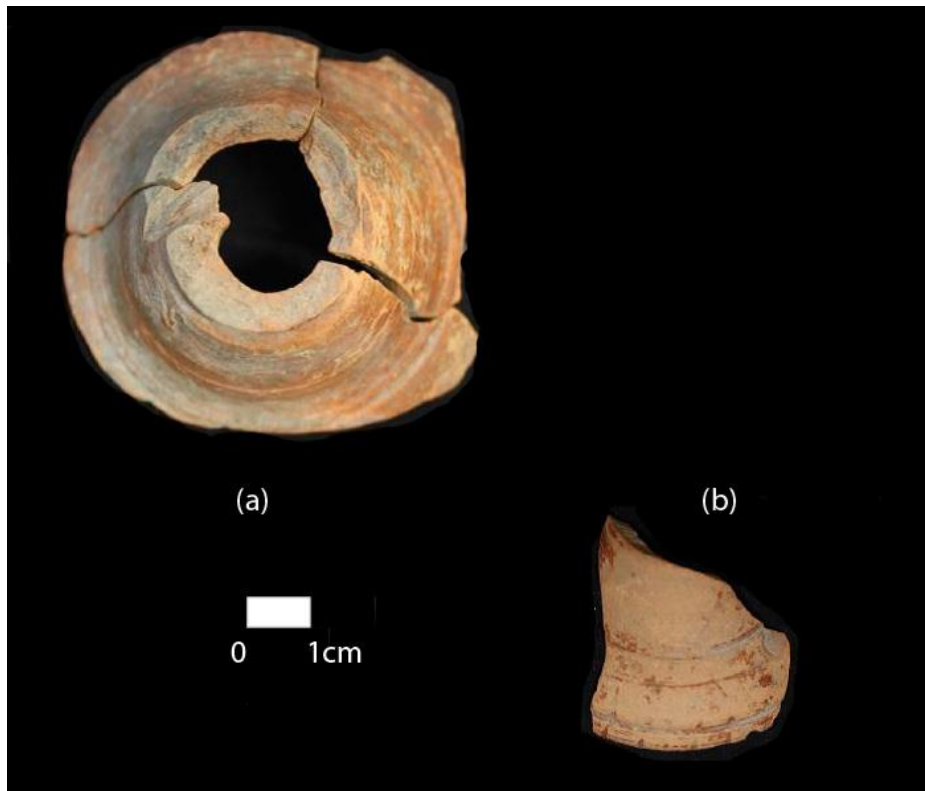
A small proportion (0.68%) of the sherds from excavations at Nilandhoo Foamathi fell into the glazed category, with the majority of these being a black glazed earthenware. These sherds could belong to the Far Eastern Ware class, with a tentative manufacture date of between the twelfth and fourteenth centuries (Baoping Li pers. comm. July 2015). A British sherd of approximately nineteenth to twentieth century manufacture was recovered from the XU 3 of Feature 4, highlighting the taphonomic issues present in the uppermost layers and discussed in the previous chapter.

The largest proportion of wares across all contexts and units at Nilandhoo Foamathi belonged to the South Asian Ware family. Several ware types were identified, including the ‘fine wares’ of NBPW and IRPW and earthenwares including PIW and other decorated sherds not identified to type. Only one identified piece of NBPW was recovered from Nilandhoo Foamathi, from the surface context, belonging to a globular pot, with a narrowed neck, decorated on the shoulder (Heidrun Schenk pers. comm. July 2015). Five sherds of Indian Red Polished Ware were recovered from the site also from the surface context, with a variety of forms represented including lamps and sprinkler water jars, the former being used for religious purposes (see Fig. 6.6).

The earthenwares formed the larger proportion of the South Asian Wares, with almost all taking the form of *handi* or large storage vessels. The majority were tempered with quartz sand, with little evidence for calcareous inclusions, furthermore only two pots had been tempered with grog. The rim-types present suggest a large proportion of *handi*. Their storage and cooking role is further supported by the vessels’ high porosity, and sooting on the exterior of the pots. The large quantities of these sherds in the assemblage, indicates a high turnover of this vessel type, further supporting their use in cooking. Moreover, the decoration styles were classified into only two types, which were present across temporal and spatial contexts at the sites (see Table 6.13). IND 2 is indicative of the PIW found in Southern India and was distributed for considerable time, from the first millennium CE, through to the contemporary period.





*Figure 6.5 Sasanian-Islamic Ware
Nilandhoo Foamathi, Surface Find
Credit: Mirani Litster*



*Fig 6.6 Sprinkler Water Jars. Indian Red-Polished Ware.
Nilandhoo Foamathi, Surface Finds.
Credit: Mirani Litster*

Table 6.13 Decoration Types, South Asian Wares (Mirani Litster)

Decorative Type	Description	Illustration
IND 1	Cord Impressed	
IND 2	Paddle Impressed	

6.4.4 Ceramic Assemblage from Bodu Havitha

Bodu Havitha returned a small sample of diagnostic ceramics, representing three ware families. All were body sherds, and were not recovered in dated contexts. A total of 40 sherds with a corresponding weight of 389.76 g were recovered and the majority were excavated from the lower layers of Trench 3 and 4, with five sherds located on the surface.

One example of both the West Asian and Glazed Ware families were present in the assemblage, the former being of Sasanian-Islamic origin. The remainder were undecorated earthenwares of likely South Asian provenance.

Table 6.14 Absolute sherd quantities at Bodu Havitha and corresponding dates (Mirani Litster)

Context	XU	Section	Sherds (n=)	Weight (g=)	Corresponding Dates
Havitha		7	5	104.76	Post-1153 AD
Trench 3	3		17	256	NA
Trench 4	3		18	29	NA
TOTAL			40	389.76	

Table 6.15 Absolute Quantities of Ware Families Across Contexts (Mirani Litster)

Context	XU	Section	South Asian Wares	West Asian Wares	Glazed Wares
Havitha		7	4	1	
Trench 3	3		16		1
Trench 4	3		18		
TOTAL			38	1	1

6.4.5 Ceramic Assemblage from Dhadimagi Havitha

The pottery from Dhadimagi Havitha has a total sherd count of 423, with a weight of 3476.25 g. The pottery was found in undated contexts although was recovered across the site as detailed below in Table 6.16.

Table 6.16 Absolute sherd quantities at Dhadimagi Havitha and corresponding dates (Mirani Litster)

Context	XU	Sherds (n=)	Weight (g=)
Miskik Maga	1	8	116
Bath	NA	13	NA
Excavation Trench	1	142	1643.5
Excavation Trench	2	179	1288.7
Excavation Trench	3	81	426
TOTAL		423	3474.2

Table 6.17 Absolute Quantities of Ware Families, Dhadimagi Havitha (Mirani Litster)

Context	XU	East Asian	Western Asian	Glazed Wares	South Asian	Total
Miskik Maga	1	0	0	0	8	8
Bath	NA	1	1	0	11	13
Excavation Trench	1	0	0	1	141	142
Excavation Trench	2	0	0	0	179	179
Excavation Trench	3	0	0	0	81	81
TOTAL		1	1	1	420	423

The sample consisted largely of South Asian ceramics, with very minimal quantities of East Asian, Western Asian and Glazed Wares. The one sample of glazed ware thought to be East Asian was tentatively attributed to the 12–13th century AD (See Fig. 6.7; Baoping Li Pers. Comm. July 2015). One example of Sasanian-Islamic Ware (TURQ) was located in the same context, and was identical to that recovered at Bodu Havitha (See Fig. 6.5).

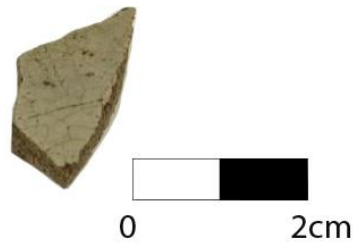


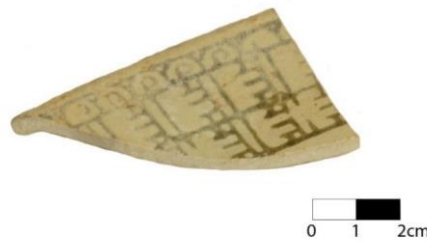
Figure 6.7 East Asian Glazed Ware. Possibly 12-13th Century.

Credit: Mirani Litster

The majority of the ceramic material excavated from Dhadimagi Havitha, and from all features at the site, were quartz tempered *handis* with no decoration—only one rim sherd was decorated with incised lines. The largest proportion of sherds were rims and bodies, with few shoulders.

6.4.6 Surface Scatters and Surveys

The surface scatters and surveys consisted of very minimal ceramic finds, which will be outlined briefly here. Four sherds were returned from Taddhoo Island, and consisted of a stepped rim sherd, two cord impressed South Asian Wares, and one West Asian ceramic of a likely recent manufacture date (see Fig. 6.8). The surface scatters collected from Vadhoo Island (alongside an assemblage of beads to be discussed in Chapter Eight) included likely South Asian cord impressed quartz tempered pottery.



*Fig. 6.8 Western Asian plate, Taddhoo Island
Credit: Mirani Litster*

6.5 Summary and Conclusion

The descriptive results discussed here illustrate several patterns concerning ceramic use and discard in the Maldives. A presence of South Asian ceramic at all investigated sites during all occupation phases was revealed, with the majority being quartz tempered PIW and cord impressed types. The decorated types designated to two categories of cord and paddle impressed wares were found in the northern and central sites; however, the assemblages from the southern sites contained less decorated ceramic material. The form of these earthenwares was typically *handi*, with soot evident on a large proportion of the vessels, confirming their use in cooking. Other South Asian material included NBPW and IRPW in more decorative forms, including sprinklers and lamps, the latter typically are found in ritual contexts in Sri Lanka, which agrees with their Maldivian context in Buddhist monasteries.

Chinese material was also evident at all sites in the more recent phases, interestingly larger volumes of celadon was present at Kuruhinna Tharaagadu, where no other glazed or Western Asian material was found. Material belonging to the early-mid Qing and late-Qing periods was recovered from Nilandhoo Foamathi. This included wares specifically designed for export across the Indian Ocean. The southern and central sites returned Western Asian material in more recent contexts, including glazed Sasanian Islamic pottery, and other glazed ceramics not definitely attributed to a particular region.

In summary the ceramic analysis reveals a long standing import of South Asian earthenwares for use in storage and cooking, with the inclusion of finer wares such as

Indian Red-Polished Ware, Northern Black Polished Ware and Sasanian-Islamic Ware for serving, decorative or ritual purposes. Later import of Chinese wares is evident at all sites, but especially Kuruhinna Tharaagadu and Nilandhoo Foamathi. The implications of the ceramic analysis for the Maldives is explored in Chapter Nine with the main points summarized below:

1. The use of *handis* in Maldivian contexts mirror that of the adjacent mainland, providing evidence for the homogenization of cultural behaviours in the region—a hallmark of globalization; and,
2. The diversity of ceramic materials from a variety of regions increases in the later Islamic period, highlighting increasing connections to a range of networks and providing evidence for heterogeneity—another hallmark of globalization.

7

Faunal Remains

7.1 Introduction

As outlined in Chapter Four, knowledge of early hunting and use of marine and terrestrial taxa in the Maldives is currently limited to insights gleaned from historical documents and inferences made from the ethnographic record. Both records highlight a resourceful use of marine stocks for consumption and other purposes, owing to the constraints imposed by a depauperate terrestrial environment (Munch-Petersen 1982; Romero Frías 1999; Maloney 2013).

The analysis of faunal remains is relevant to the research aims in that the timing and introduction of foreign taxa to the island group will assist with establishing early colonization events. The limited use of foreign or introduced species for consumption also can be suggestive of local development processes, such as ethnogenesis. This is illustrated by the contemporary Maldivian diet, which involves a preference for Skipjack tuna in lieu of other readily available fish types or introduced animals. The invertebrate faunal assemblage is also integral to the research aims of this thesis as it involves the analysis of large and small deposits of shell money—*Monetaria moneta*. These results address key questions concerning the timing and extent of the cowry shell industry in the Maldives and Indian Ocean area more generally.

This chapter presents the methods and results garnered from the analysis of excavated faunal remains from Kuruhinna Tharaagadu, Nilandhoo Foamathi, Bodu Havitha and Dhadimagi Havitha. It is partitioned into vertebrate (non-fish and fish) and invertebrate fauna. The assemblages were analyzed at varying levels of intensity, which was related to the availability and access to assemblages—a sample of the total was analyzed from the Kuruhinna Tharaagadu site, and the total assemblages from Nilandhoo Foamathi, Bodu Havitha and Dhadimagi Havitha were analyzed.

7.2 Modern Fauna

This section provides a brief introduction to the modern Maldivian fauna. Contemporary accounts of species present in the Maldives, highlight the low levels of endemism in the islands, and built upon the very early regional accounts by Gardiner (1901) and Aggasiz (1903).

The terrestrial fauna of the Maldives is restricted and relatively understudied. Terrestrial vertebrates in the Maldives consist mainly of fruit bats, birds, reptiles and commensals and domesticates (Munch-Petersen 1982; Webb 1988). Two sub-species of fruit bat are endemic to the islands, which includes the large Indian Flying Fox *Pteropus giganteus ariel* and the Small Flying Fox *Pteropus hypomelanus maris*, the latter being endangered and recorded as restricted to the Southern Maldives (Holmes 1993; O'Brien 2011). Terrestrial reptiles have been listed as consisting of approximately two gecko species, two agamid lizards, including the common-garden lizard (*Calotes versicolor*) and snake skink (*Lygosoma albopunctata*). Two snake species have also been recorded—*Lycodon aulicus* and *Typhlops braminus*. Avifauna is largely limited to seabirds and shorebirds (waders), with approximately 180 different species recorded in the Maldives, the majority being seasonal visitors (Phillips 1958, 1963; Factor and Shafeega 2010). Small quantities of amphibians have been recorded including one frog species—*Rana breviceps*, and a toad species *Bufo melanostictus* (Phillips 1958, 1963; Webb 1988).

The only domesticates found in the islands include cats, rabbit, goat, and large quantities of chicken. No pigs or dogs are present in the Maldives in accordance with Islamic state law (Munch-Petersen 1980:75; Vitharana 1997:2). Rabbits were likely introduced by the Portuguese or the Dutch from the sixteenth or seventeenth century, from India (Niethammer 1963). Cats are also referred to by Pyrrard de Laval 'there are great stores of cats, foinés and ferrets' (de Laval 1887:524). Chickens are very common among the islands.

Commensal animals, such as rats and the Indian Musk-shrew (*Suncus murinus*) are also present in the Maldives. Rats (species unknown) were present in the Maldives prior to 1900, probably transported by trade-ships (or from shipwrecks) travelling between Sri Lanka and Male' (Bentley and Bathard 1959; Harper and

Bunbury 2015). In the Indian Ocean, Black Rats or Ship Rats (*Rattus rattus*) were present from the ninth century, dispersed by Arab traders throughout the region (Cheke 2010). Norway Rats *Rattus norvegicus* were recorded in the Western Indian Ocean region later, with an invasion apparent in the Seychelles by the late 1970–1980s (Cheke 2010). The Indian Musk-shrew is an efficient and rapid colonizer of the Soricidae family, having spread from its initial Indian origin to the Western Indian Ocean islands, and is now present in the Maldives and other remote island (Varnham *et al.* 2002). Currently *Rattus rattus* and *Pteropus giganteus ariel* depredate coconuts and fruits such as almonds, guava and mangoes resulting in a reduction of crop-yield by at least 40% (Dolbeer 1988; Fiedler 1984).

In contrast to the limited terrestrial fauna, the Maldives host an abundant and rich marine fauna. In excess of 1,000 different fishes, including cartilaginous types such as rays and sharks are present. The total known shore and epipelagic fish fauna of the Maldives sits at 1007 species, and a total known demersal and epipelagic fish fauna at 1090 (Shiham *et al.* 1997; Anderson *et al.* 1998). Fishbase, an online database updated by ichthyologists, lists 1113 species in the area. These counts include approximately 40 species of shark and 16 ray species. Marine mammals such as dolphins, whales and dugong (*Dugon dugon*) are present throughout the archipelago, in addition to five species of endangered turtles including loggerhead, green, hawksbill, olive ridley, and leatherback turtles (Frazier and Frazier 1987).

The tropical environment of the Maldives supports a rich invertebrate fauna, including centipedes, millipedes, scorpions, molluscs and 57 species of spider. Many of the latter are similar to those found on the southwestern coast of the Indian mainland and Sri Lanka, illustrating a ‘chance assemblage’ arriving from neighbouring land (Pocock 1904; Sunil 2012). Some terrestrial land crabs are also present in the islands. The low habitat diversity engenders relatively low faunal species diversity, for example only a few species of spider are endemic to the islands (Sunil 2012).

Marine invertebrates include crustaceans such as lobsters, crabs and shrimp. Molluscs are numerous, falling into bivalve, scaphopod, cephalopod, and gastropod categories. They exist in quantities and of a species range too numerous to outline in the region—

the most well-known include *Tridacna gigas* and *Monetaria moneta*, the latter because of its use as shell money.

7.3 Methods for Identification

Faunal material was identified by several researchers at different institutions. Initially, the assemblages were transported from excavation locations in the Maldives to Oslo in Norway, from Kuruhinna Tharaagadu to the University of Oslo and the NMI to the Kon-Tiki Museum. The assemblage acquired from Kuruhinna Tharaagadu by Mikkelsen, was partially identified by Leiff Jonsson (University of Gothenburg) in Sweden (Mikkelsen 2000), although not published, and remains from Nilandhoo Foamathi were counted (NISP) by Mikkelsen (see Skjølsvold 1999); however, not refined to taxa. The other assemblages from Bodu Havitha and Dhadimagi Havitha were not analyzed in any manner.

The vertebrate bones from the NMI were transported to the Australian National University in 2010 for identification by Mirani Litster. The mammal, reptile and bird bone was identified to broad taxa and the fish bone was identified using the comparative faunal reference collection in the Department of Archaeology and Natural History. Mark Oxenham assisted in determining the potential human origin of bone from Bodu Havitha. Subsequently, reptile bone from Kuruhinna Tharaagadu was subjected to DNA analysis by Greger Larson (University of Oxford) and isotope information ($\delta^{13}\text{C}$) from original dating reports (Trondheim Dating Facility) was sourced to discern characteristics of the Chelonian diet.

The molluscan remains were analyzed during July–August 2010 in Oslo by Mirani Litster. Further to this high-resolution photographs of the shells and bones were taken in Oslo in 2010. This enabled further confirmation of molluscan remains at the Australian National University, through the use of the comparative faunal reference collection and the World Register of Marine Species Database (WORMS).

Sections 7.3.1 and 7.3.2 outline the more detailed methodology for the vertebrate and invertebrate assemblages.

7.3.1 Vertebrate Assemblage

The non-fish assemblage was identified to broader taxa groups, such as rat, bird and turtle. Identifications to family, genus or species were not achieved and NISP was calculated for each taxon and tabulated in Section 7.4. Each fragment was recorded with a unique identification number, site details (including associated feature and XU details), taxa, class, element, portion, side and number. Further taphonomic details were recorded where relevant, and are detailed below.

The fish bone, however, was less fragmentary and formed the largest portion of the sample and both the NISP and MNI were recorded. Zooarchaeological researchers in the tropical Pacific recommend a detailed methodology for identification in the laboratory (Anderson 1973, 1979; Leach and Davidson 1977; Dye and Longenecker 2004; Vogel 2005; Ono and Intoh 2011). This involves discerning diagnostic skeletal elements with morphological landmarks that enable family or above family levels of identification. This has been loosely called 'the five-paired jaw bone system' and includes the dentary, premaxilla, articular, maxilla and quadrate and several other 'special' fish-bones unique to particular fish taxa (see Figure 7.1). However, issues associated with different identification and quantification methods have been raised as influencing sample size, taxonomic diversity, taxonomic relative abundance and skeletal element representation (Vogel 2005). To ameliorate some of these issues a wider range of elements have been used in identifications. Consequently, where possible, attempts were made to go beyond the five-paired jaw bone system to include 'special bones' (see Table 7.1 for elements). The bones were determined to family where possible, with one species identifiable in the assemblage—*Monotaxis grandoculis*. Each fragment was recorded with a unique identification number, site details (including associated feature and XU details), class, family, species, element, portion, side and number of identified specimens (NISP). Further taphonomic details were made where relevant, and followed Piper (2003) and Campos (2009) including:

- 1) Abrasion: wearing resulting in a loss of surface morphology;
- 2) Burning: charred black or a calcined bluish-white/grey;
- 3) Pitting: obvious indentations to the bone surface generally caused by trampling;
- 4) Weathering: prolonged exposure to surface weathering, appears as fine longitudinal splitting;

- 5) Anthropogenic marks: which are diverse and include potential modification into tools, cut marks, chop marks and scrape marks per Potts and Shipman (1981); and,
- 6) Post-excavation marks: marks occurring during excavation or processing.

Table 7.1 Fish skeletal elements identified to taxonomic (class, family or species) level (Mirani Litster)

Premaxilla	Quadrate	Vertebrae (Elasmobranchii and Scombridae only)
Maxilla	1 st dorsal spine (Balistidae and Holocentridae)	Superior Pharyngeal Cluster (Scaridae and Labridae only)
Articular	Dermal spines (Diodontidae only)	Inferior Pharyngeal Cluster (Scaridae and Labridae only)
Dentary	Dermal Plate (Ostraciidae only)	

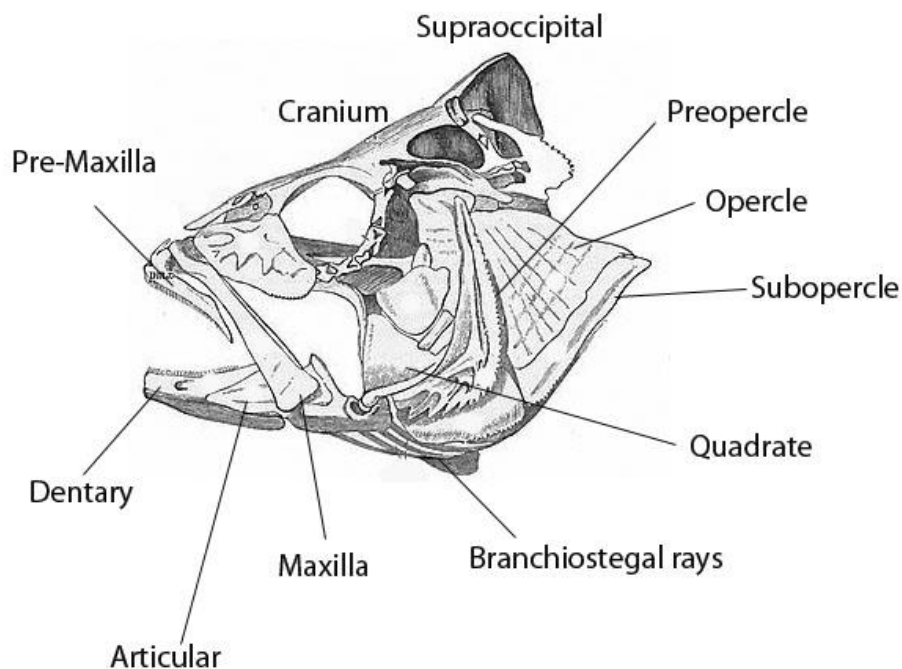


Figure 7.1. Anatomy of a teleost head, including the five-paired jaw bones

Credit: Creative Commons and modified by Mirani Litster

7.3.2 *Invertebrate Assemblage*

Invertebrate fauna formed the largest portion of the sample, the majority being shellfish otherwise referred to as molluscs. Small quantities of crab (Decapoda) and sea urchin (Echinoidea) were also found. The latter were quantified by weight and total count, and not determined to species or family. The shellfish were subjected to a finer resolution of identification and quantification than the other invertebrates. Common protocols were followed to classify shells into species per unit based on shell morphology, or if this was not possible genus or family were identified (Claassen 1998; Mason *et al.* 1998).

In order to establish relative proportions of various mollusc taxa within the assemblages, it was necessary to follow a systematic manner of quantification (Lyman 1994; Reitz and Wing 1999). The relative merits and weaknesses between different palaeozoological quantification methods have long been debated by zooarchaeologists (Grayson 1984; Lyman 2008). Here two counting units, NISP (number of individual specimens) and MNI (or minimum number of individuals), were discerned per shellfish taxon. NISP provides the count of all shell fragment of each species in the assemblage; however, multiple fragments associated with the same individual shell specimen can be included in the count, and it is less useful in determining the number of shellfish in the deposit. Differential fragmentation between species and the overall fragmentation of assemblages results in a questionable validity where higher fragmentation rates inflate total counts and also result in an underrepresentation of robust shells. Therefore, it is important to use the MNI together with this count. The MNI is a conservative count as it estimates the fewest individuals. Here the MNI was calculated by consistently choosing a non-repetitive element (NRE) that occurred most frequently (to eliminate issues associated with choice of the NRE prior to analysis) according to the taxa. In gastropods this typically refers to the spire and in bivalves, umbos and hinges. The NRE chosen per taxon is indicated in the relevant table. It is worth noting that choosing only one NRE to quantify MNI impacts upon richness and diversity measures and other molluscan NREs can be incorporated into the count to overcome this issue (Harris *et al.* 2015). The extremely limited fragmentation of the assemblage; however, did not require an alternative to the 'traditional MNI' count, where only one NRE was chosen (White 1953).

Table 7.2 NRE (shell body part) used per identified shellfish taxa in the Maldivian assemblages to obtain MNI counts (Mirani Litster)

Identified Taxa	NRE
<i>Monetaria moneta</i>	Aperture
<i>Cypraea tigris</i>	Aperture
<i>Monetaria annulus</i>	Aperture
<i>Ovatipsa chinensis</i>	Aperture
<i>Palmadusta asellus asellus</i>	Aperture
<i>Monetaria caputserpentis</i>	Aperture
Cypraeidae	Aperture
<i>Tridacna sp.</i>	Left umbo
<i>Tridacna maxima</i>	Left umbo
<i>Strombus sp.</i>	Apex
<i>Lambis lambis</i>	Left umbo
<i>Lentigo lentiginosus</i>	Apex
<i>Turbo sp.</i>	Spire
<i>Turbo sp. opercula</i>	Whorl
<i>Turbo mamoratus</i>	Spire
<i>Conus barthelemyi</i>	Apex
<i>Trochus maculatis</i>	Spire
Bivalvia	Left umbo
<i>Periglypta puerpera</i>	Left umbo
Unidentified	NA

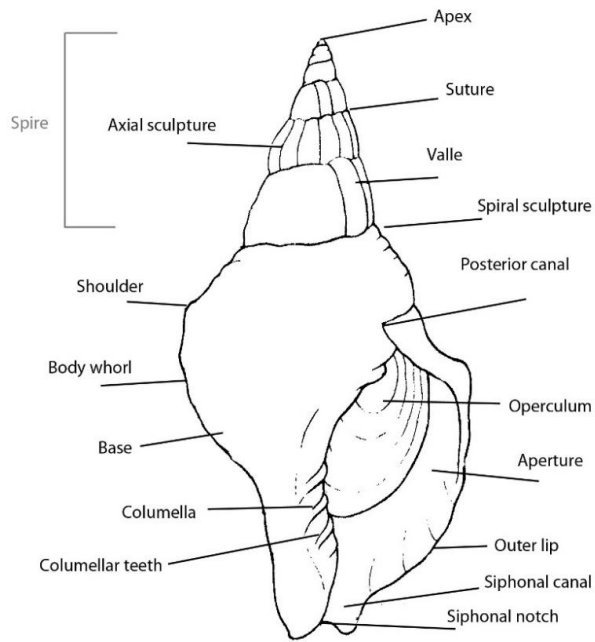


Figure 7.2 Gastropod

Credit: Creative Commons and modified by Mirani Litster

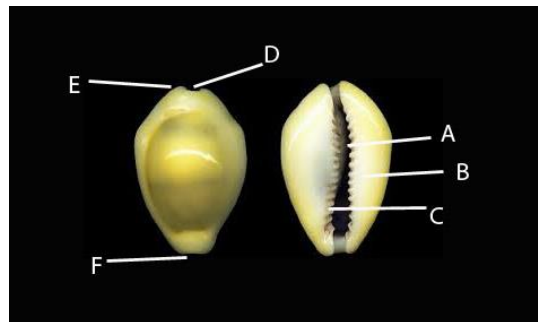


Figure 7.3 Monetaria moneta

A - Aperture, B - Outer Lip, C - Fossula

D - Posterior Canal, E - Spire, F - Anterior Canal

Credit: Creative Commons and modified by Mirani Litster

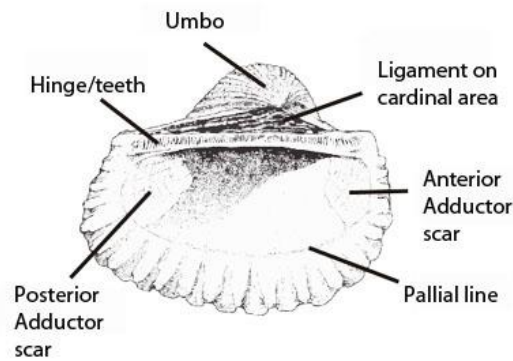


Figure 7.4 Bivalve

Credit: Creative Commons and modified by Mirani Litster

7.4 Vertebrate Faunal Remains: Results and Analysis

The total NISP of excavated vertebrate faunal remains from Maldivian sites numbers 1831.¹ The non-fish assemblage totals 871 bones, with a large proportion being human skeletal remains recovered from the graves at Kuruhinna Tharaagadu. The fish remains total a NISP of 960. Table 7.3 outlines the presence of particular taxa at Maldivian archaeological sites.

Table 7.3 Presence of Vertebrate Taxa at Maldivian Archaeological Sites (Shading = Present) (Mirani Litster)

Taxon	Kuruhinna Tharaagadu	Nilandhoo Foamathi	Bodu Havitha	Dhadimagi Havitha
Bird				
Rat				
Turtle				
Tortoise				
Human				
Fish				

7.4.1 Mammal

Mammal remains recovered from sites in the Maldives include human and small quantities of rat (Muridae) at the sites Kuruhinna Tharaagadu, Nilandhoo Foamathi,

¹ The figures reported from Kuruhinna Tharaagadu represent a sample of the total excavated assemblage, whereas all other reported figures from Maldivian sites, represent the total excavated assemblage.

Bodu Havitha and Dhadimagi Havitha. Four complete articulated human skeletons were recovered from Kuruhinna Tharaagadu (NISP = 824) by Mikkelsen and have been dated to the Buddhist period (see Fig. 7.7; see Chapter Five for associated radiocarbon dates; Mikkelsen 2000). Moreover, several pieces of bone excavated at Bodu Havitha had initially been identified as human crania fragments (cf. Skjølsvold 1991); however, subsequent analysis by Litster at the Australian National University confirmed their identification as fragments of turtle carapace/plastron.

Rat remains were minimal, but were present at all sites except the far southern Dhadimagi Havitha site. The rat bone has not been identified to species, although is likely *Rattus rattus*, because of their earlier dispersal throughout the Indian Ocean. One rat femur was recovered from Nilandhoo Foamathi from recent layers associated with the post-Buddhist period (see Fig 7.6), in addition to a rat tooth from XU6. Two rat mandibles (one highly fragmented) were also recovered from one of the lower layers of a trench excavated adjacent to Bodu Havitha (see Fig 7.5). These remains are likely associated with the earlier Buddhist period (as discussed in Chapter Five). Two additional rat bones were identified in the sample obtained from Kuruhinna Tharaagadu, including two un-fused tibia and one rat incisor.

7.4.2 Reptile

Remains of reptile were recovered from all sites except Nilandhoo Foamathi, and consisted mainly of turtle plastrons or carapaces. These identifications are presented in Table 7.4–7.7. The largest amounts of turtle bone were recovered from Bodu Havitha and the Kuruhinna Tharaagadu sample. Bodu Havitha returned seven turtle bones, and Dhadimagi Havitha 2 bones. Samples from Kuruhinna Tharaagadu included ten turtle carapace/plastron fragments.

Additionally, remains of *Aldabrachelys gigantea* (which were originally identified at the *University of Gothenburg* by Leif Jonsson in 2000) were associated with Feature 42 of Kuruhinna Tharaagadu and returned a date of 725–885 CE (T-13680). This would be the first recovered and only example of this species in the Maldives. The only contemporary population of giant tortoise is present on the island of Aldabra in the Seychelles; however, they once inhabited other Western Indian Ocean islands.



*Figure 7.5. Rat Mandibles
(bottom: right complete mandible, top left: left ramus; top right: fragments)
Bodu Havitha, Trench 1, XU 3
Credit: Mirani Litster*



*Figure 7.6. Left Rat Femur (diaphysis anterior view)
Nilandhoo Foamathi, Feature 4, XU 2
Credit: Mirani Litster*



*Figure 7.7. Human skeletal remains
Kuruhinna Tharaagadu, Grave Feature
Credit: Egil Mikkelsen (Mikkelsen 2000)*

Geneticists have posited a Malagasy tortoise ancestor for the source of giant tortoise colonization to Western Indian Ocean islands (Palkovacs *et al.* 2002). Their distribution has also been argued to involve independent dispersal along the strong Indian Ocean currents, with no human intervention involved (Gerlach 2006).

The possibility that the *?Aldabrachelys gigantea* specimen was misidentified needs to be considered. To investigate this a bone sample was sent to Durham University for DNA analysis to confirm the initial species ID. Unfortunately, no endogenous DNA could be extracted from the bone (Larson pers. comm. February 2012). Further isotopic information was sourced from the original dating reports to establish if the animal was consuming a marine or terrestrial diet. The $\delta^{13}\text{C}$ results were -12.6 (T-13680) indicating that the animal was subsisting off a marine diet, which contravenes the anticipated results if it were a *?Aldabrachelys gigantea* specimen *or* it indicates that it was consuming C4 plants. The modern vegetation available on the island includes breadfruit and pandanus which are C3 and CAM plants respectively. The available modern vegetation on the island (C3 and CAM plants) in relation to the $\delta^{13}\text{C}$ results suggest the animal was consuming a marine based diet, as such it is recommended that the initial identification be regarded as tentative (Kinaston pers. comm. February 2014).

7.4.3 Bird

Very few bird remains were recovered during the excavations in the Maldives (NISP = 11). The results of which are presented in Table 7.4–7.7. Bird bone is also only present at one site—Nilandhoo Foamathi—and was associated with two features (Features 1 and 4). In Feature 4 (XU2 and XU3), all recovered bird bone was from more recent layers. The bird bone recovered from Feature 1 was in the fill associated with the more recent Islamic period. Potential chicken (*Gallus gallus*) bone has been found (see Fig 7.8) in addition to a potential juvenile seabird (see Fig 7.9).



*Figure 7.8 Bird Left Humerus Shaft, cf. chicken (Gallus gallus).
Nilandhoo Foamathi, Feature 4, XU2
Credit: Mirani Litster*



*Figure 7.9 Distal Coracoid, cf. juvenile seabird.
Nilandhoo Foamathi, Feature 4, XU2
Credit: Mirani Litster*

Table 7.4 Non-Fish Remains, Kuruhinna Tharaagadu (Sample of Total)
(Mirani Litster)

	Feature 2		Feature 42		Grave Complex	
Taxon	XU 1	XU 1	XU 1	XU 1	TOTAL NISP	
<i>Homo sapien</i>	0	0	0	824	824	
Chelonii	10	0	0	0	10	
? <i>Aldabrachelys gigantea</i>	0	1	0	0	1	
Muridae	3	0	0	0	3	
Undiagnostic	7	0	0	0	7	
NISP	20	1	0	824	845	

Table 7.5 Non-Fish Remains, Nilandhoo Foamathi (Mirani Litster)

	Feature 1		Feature 4		
Taxon	XU1	XU 2	XU 3	XU6	TOTAL NISP
Bird	1	6	4	0	11
Muridae	0	0	1	1	2
NISP	1	6	5	1	13

Table 7.6 Non-Fish Remains, Bodu Havitha (Mirani Litster)

	Havitha			Trench 1		Trench 4	
Taxon	C	Section 4	Section 8	XU 3	XU4	XU3	TOTAL NISP
Muridae	0	0	0	4	0	0	4
Turtle	1	2	2	0	2	0	7
NISP	1	2	2	4	2	0	11

Table 7.7 Non-Fish Remains, Dhadimagi Havitha (Mirani Litster)

	Havitha	
Taxon	XU1	TOTAL NISP
Turtle	2	2
NISP	2	2

7.4.4. Fish

Fish remains were excavated from all Maldivian sites and outnumber all other faunal remains. This aligns with known ethnographic evidence suggesting a high reliance on marine fauna especially fish in lieu of available terrestrial resources (Romero-Frías 1999). Tables 7.8 and 7.9 overview the absolute and relative frequencies (NISP and MNI respectively) of fish taxa identified in the Maldivian archaeofaunal assemblages.

The fish remains from the sample analyzed from Kuruhinna Tharaagadu had a total NISP of 16, with 8 specimens identified to family or sub-class and an MNI of 3 (see Table 7.9 and 7.10). The total sample was obtained from the excavated unit from Feature 2, which was a residential section of the site (see Chapter Five). Elasmobranchii (Sharks/Rays), Carangidae (Jacks, Mackerels) and Lethrinidae (Emperors) were identified in equal relative proportions of 33% each (MNI).

Carnivorous reef taxa include the Lethrinids and Carangids, which are typically captured by Maldivians using baited hooks on handlines (Anderson *et al.* 1992). Four of the five Lethrinidae elements were able to be determined to species—*Monotaxis grandoculis*—locally referred to as *Dhongu* (Humpnose-Big Eyed Bream). *Dhongu* can be seen around coral reefs to a depth of between 3–60 m. These are not frequently caught by Maldivians for commercial consumption, unlike the fast-moving rovers, the Carangids, which are commonly seen at the fish markets (Food and Agriculture Organization 2015).

Elasmobranchii vertebrae were also identified. These are one of two subclasses of cartilaginous fish within the larger class Chondrichthye, and include both shark (Selachimorpha) and ray (Batoidea) superorders. There is currently little local demand for Elasmobranchii products in the Maldives, except for shark liver oil and skin to use in the polishing and sanding of wooden boats—the Maldivian *dhoni* need to be dragged ashore once every two weeks to be oiled (Anderson and Hafiz 2002; see Fig. 7.10). The traditional shark fishing industry was called *maakeyolhu kan* (big-line fishing), where large hooks were used to target species with large livers e.g. tiger and whale sharks (Anderson and Ahmed 1993). This industry collapsed by the 1960s with the introduction of long-lining and is now banned (Food and Agriculture Organization 2015).



*Figure 7.10 Painting a dhoni with shark liver oil
Credit: Anderson and Ahmed 2003:18*

Table 7.8 Absolute and relative frequency (NISP) of fish taxa from Maldivian sites (Mirani Litster)

Taxon	Kuruhinna Tharaagadu		Nilandhoo Foamathi		Bodu Havitha		Dhadimagi Havitha		All Sites	
	NISP	% NISP	NISP	% NISP	NISP	% NISP	NISP	% NISP	NISP	% NISP
Elasmobranchii	1	6.25	10	1.01	1	14.28	7	43.75	19	1.85
Serranidae	0	0	4	0.4	0	0	0	0	4	0.39
Acanthuridae	0	0	3	0.3	0	0	0	0	3	0.29
Holocentridae	0	0	1	0.1	0	0	0	0	1	0.1
Carangidae	1	6.25	3	0.3	0	0	0	0	4	0.39
Lutjanidae	0	0	10	1.01	0	0	0	0	10	0.97
Lethrinidae	6	37.5	11	1.11	0	0	0	0	17	1.66
Scaridae	0	0	22	2.2	0	0	0	0	22	2.14
Sphyraenidae	0	0	1	0.1	0	0	0	0	1	0.1
Balistidae	0	0	3	0.3	0	0	0	0	3	0.29
Diodontidae	0	0	0	0	1	14.28	0	0	1	0.1
Ostraciidae	0	0	1	0.1	0	0	0	0	1	0.1
Scombridae	0	0	109	11	0	0	0	0	109	10.61
Fish sp.	8	50	810	81.98	5	71.43	9	56.25	832	81.02
NISP	16	100	988	100	7	100	16	100	1027	100

Table 7.9 Absolute and relative frequency (MNI) of fish taxa from Maldivian sites (Mirani Litster)

Taxon	Kuruhinna Tharaagadu		Nilandhoo Foamathi		Bodu Havitha		Dhadimagi Havitha		All Sites	
	MNI	% MNI	MNI	% MNI	MNI	% MNI	MNI	% MNI	MNI	% MNI
Elasmobranchii	1	33	5	20	1	50	1	100	8	19
Serranidae	0	0	2	8	0	0	0	0	2	4.8
Acanthuridae	0	0	1	4	0	0	0	0	1	2.4
Holocentridae	0	0	1	4	0	0	0	0	1	2.4
Carangidae	1	33	3	12	0	0	0	0	3	12
Lutjanidae	0	0	6	24	0	0	0	0	6	14.3
Lethrinidae	1	33	6	24	0	0	0	0	7	17.4
Scaridae	0	0	4	16	0	0	0	0	4	9.5
Sphyraenidae	0	0	1	4	0	0	0	0	1	2.4
Balistidae	0	0	2	8	0	0	0	0	2	4.8
Diodontidae	0	0	0	0	1	50	0	0	1	2.4
Ostraciidae	0	0	1	4	0	0	0	0	1	2.5
Scombridae	0	0	5	20	0	0	0	0	5	12
MNI	3	100	25	100	2	100	1	100	42	100

Table 7.10 Fish Remains, Kuruhinna Tharaagadu (Mirani Litster)

Taxon	Feature 2	
	NISP	MNI
Elasmobranchii	1	1
Carangidae	1	1
Lethrinidae	6	1
Fish sp.	8	NA
TOTAL	16	3

Nilandhoo Foamathi contained the largest quantity of fish bone and the greatest species diversity from all sites, with 12 taxa identified, reaching a NISP of 988 and an MNI of 25 (see Table 7.11 and Fig. 7.14). This higher diversity is likely associated with quantity of fish bone in the assemblage, when compared to the very minimal amounts recovered from the three other sites. The most frequently observed taxa (based upon MNI) were the Lutjanids (Snappers) and Lethrinids (including *Monotaxis grandoculis*). This was followed by Elasmobranchii and Scombrids (Tunas) with an MNI of five observed for each taxa. Scaridae (Parrotfishes) followed with an MNI of four and Carangidae with an MNI of three. Balistidae (Triggerfishes) and Serranidae (Sea Basses and Groupers) were represented by two individuals, and one MNI was recorded for the following four taxa: Acanthuridae (Surgeonfishes, Tangs, and Unicornfishes), Holocentridae (Squirrelfishes), Sphyraenidae (Barracudas) and Ostracidae (Boxfishes). Diodontidae (Porcupinefishes) was the only family not represented in the Nilandhoo Foamathi assemblage, which had been recorded at other Maldivian sites.

The Lethrinids were detailed above in the section on Kuruhinna Tharaagadu, and were ranked equally here with remains of another carnivorous species—Lutjanidae. These are the snappers, which are frequently seen at the Male' fish markets. The species of Lutjanidae present in the Maldives tend to inhabit the reef area, with some inhabiting 'rocky bottom' areas. Elasmobranchii were also observed in relatively large quantities in the assemblage, equal to that of the Scombrids. All Scombridae species present in the Maldives are epipelagic or pelagic carnivores. *Katsuwonis pelamis* (skipjack tuna) is preferred to all other species, with other fish types caught only when tuna was not abundant. Skipjack tuna is a commercially significant species in the Maldives,

accounting for two thirds of the total recorded fish catch, captured almost always in the pole-and-line fishery (Adam 1999). Maldivian pole-and-line fishing has a long tradition, witnessed in the historic and contemporary period. This involves the use of live bait and a barbless hook. The poles are now constructed of fibre-glass although were traditionally composed of timber, e.g. bamboo. Despite recent economic diversification, tuna fishing and export remains the main economic activity in outer islands (Adam 1999).

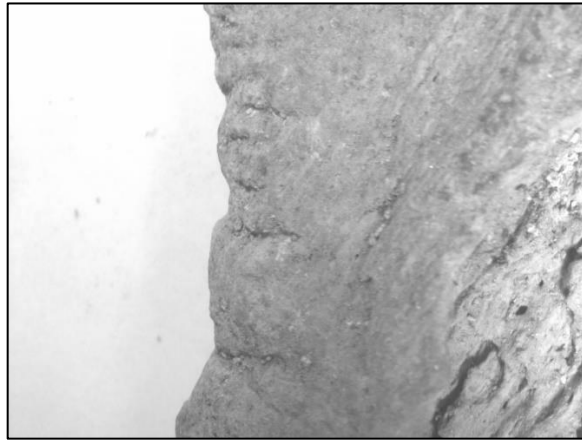
Scaridae or parrotfishes were also found at Nilandhoo Foamathi. These are a family of herbivorous grazing fish that have a distinctive pharyngeal mill enabling them to rasp or bite algae from corals. Parrotfishes are commonly found in shallow reef areas, and grind up relatively large amounts of coral rock, sand and shell fragments, contributing to bio-erosion. It is important to note that the premaxilla, dentary and pharyngeal plates of the parrotfishes are robust and likely to survive in the archaeological record. Despite their presence in the assemblage, they are uncommon at the modern fish-markets of the Male', unlike the Carangids which are frequently caught and sold in Male', and were found in equal quantities at the site—both with an MNI of 3.

The omnivorous Balistidae (triggerfishes) and carnivorous Serranidae (sea basses and groupers) were reported with an MNI of 2 each. Both are inshore reef taxa; Serranids, unlike Balistids are commonly caught and sold in the Maldives (Anderson *et al.* 1992).

Acanthuridae, Holocentridae, Sphyraenidae and Ostraciidae all were the lowest ranked taxa at the site, with an MNI of 1 each. Sphyraenids are carnivorous and tend to be found in reef areas and are very commonly caught in the Maldives today. Acanthuridae are omnivorous grazers and occupy a range of habitats (Gerking 2012). Holocentridae are mainly carnivorous, and inhabit coral-reef and shallow areas and are typically nocturnal. Ostraciidae are solitary omnivores, belonging to the Tetraodontiformes, and are closely related to the pufferfish. These are rare in the Maldives, with only two recorded species including: *Ostracion cubicus* and *Lactoria fornasini*, with no mention of their capture or sale in the fish markets. These occur in the shallows and a skin toxin is produced when alarmed.



*Figure 7.11 Cut Mark. Fish sp.
Nilandhoo Foamathi, Feature 4, XU 3 (2.5X)
Credit: Mirani Litster*



*Figure 7.12 Rat Gnawing. Fish sp.
Nilandhoo Foamathi, Feature 4, XU 3 (2.5X)
Credit: Mirani Litster*



*Figure 7.13 Drilled Elasmobranchii Vertebra Bead
Nilandhoo Foamathi, Feature 4, XU3
Credit: Mirani Litster*

Table 7.11 Fish Remains, Nilandhoo Foamathi (Mirani Litster)

Taxon	Feature 1		Feature 4															
	XU1		XU 1		XU 2		XU 3		XU 4		XU 6		XU 7		XU 9		XU 10	
	NISP	MNI	NISP	MNI	NISP	MNI	NISP	MNI	NISP	MNI	NISP	MNI	NISP	MNI	NISP	MNI	NISP	MNI
Elasmobranchii	0	0	0	0	2	1	4	1	2	1	0	0	0	0	1	1	1	1
Serranidae	1	1	0	0	0	0	2	1	1	0	0	0	0	0	0	0	0	0
Acanthuridae	0	0	0	0	0	0	3	1	0	0	0	0	0	0	0	0	0	0
Holocentridae	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0
Carangidae	0	0	0	0	1	1	2	2	0	0	0	0	0	0	0	0	0	0
Lutjanidae	0	0	0	0	8	2	2	1	0	0	0	0	0	0	0	0	0	0
Lethrinidae	0	0	1	1	5	1	2	1	0	0	1	1	0	0	1	1	1	1
Scaridae	0	0	0	0	4	1	16	2	0	0	0	0	1	1	0	0	1	0
Sphyraenidae	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0
Balistidae	0	0	0	0	2	1	0	0	1	1	0	0	0	0	0	0	0	0
Ostraciidae	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0
Scombridae	0	0	0	0	57	1	43	1	6	1	0	0	2	1	0	0	1	1
Fish sp.	1	NA	0	NA	365	NA	323†	NA	89	NA	7	NA	5	NA	0	NA	20	NA
TOTAL	2	1	1	1	445	9	398	11	99	3	8	1	9	3	2	2	24	3

† cut marks (n=1), rat gnawing (n=1) and drilled Elasmobranchii bead (n=1)

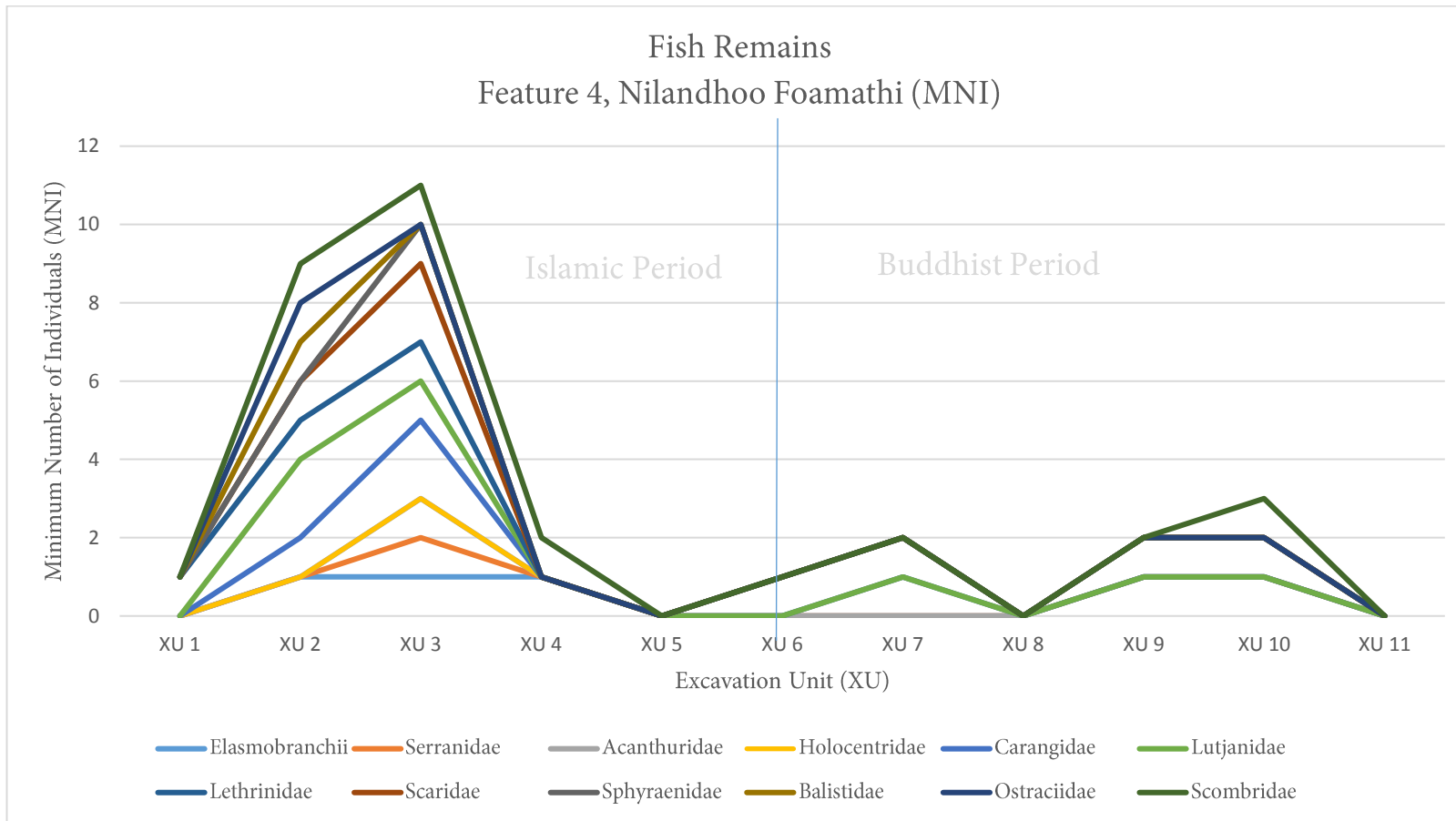


Figure 7.14 Frequency (MNI) of Fish Taxa (Stacked)

Credit: Mirani Litster

The assemblage from Nilandhoo Foamathi also contained specimens with taphonomic modifications. This included two unidentified fish bones from XU3: one with an incision made by an instrument suggesting processing and the second had been rat gnawed (see Figs 7.11 and 7.12 respectively). Additionally, an Elasmobranchii vertebra was drilled into a bead and also recovered from XU3 (see Fig 7.13).

Feature 4 of Nilandhoo Foamathi was also well dated, which affords a discussion of changes in the presence of particular fish taxa captured through time. Figure 7.14, illustrates a greater taxonomic abundance and diversity present in the more recent Islamic Period, compared to the earlier and deeper Buddhist layers, which saw only three different taxa and in smaller quantities—Lutjanidae, Scombridae and Lethrinidae. Differential preservation of the organic fraction over longer time frames would be expected as the material has been subjected to tropical conditions for longer, nonetheless the presence of these families in the lower layers infers that fishing of these taxa occurred throughout both periods—tuna has been captured for considerable time. Moreover, evidence of the fishing of both reef and epipelagic taxa is present, although in the absence of associated fishing apparatus how this occurred cannot be confirmed.

Unlike Nilandhoo Foamathi, the fish remains from Bodu Havitha were minimal, with only two taxa identified, and a total NISP of seven with only two identifiable to family or sub-class. These included an Elasmobranchii vertebra, indicating the capture of shark or ray. A Diodont (porcupinefish) pharyngeal plate was recovered from Trench 4 (XU3), see Table 7.12. These omnivorous species tend to be nocturnal and are relatively rare in the Maldives, with only four species currently present in the archipelago (Kuitert and Godfrey 2014).

Additionally, four fragments of Fish sp. were carbonized indicating they had been subjected to fire at a low temperature, probably for consumption.

Table 7.12 Fish Remains, Bodu Havitha (Mirani Litster)

Taxon	Trench 1		Trench 4	
	XU 4		XU 3	
	NISP	MNI	NISP	MNI
Elasmobranchii	1	1	0	0
Diodontidae	0	0	1	1
Fish sp.	5†	NA	0	NA
TOTAL	6	1	1	1

† charred black (n=4)

Similar to the quantities returned from Bodu Havitha, the fish remains at Dhadimagi Havitha were minimal (see Table 7.13), with only 16 bones recovered, and most not identifiable beyond ‘fish’. Seven vertebrae belonged to Elasmobranchii (NISP=7, MNI=1), indicating the capture of sharks/rays. These Elasmobranchii vertebrae present in Dhadimagi Havitha were noticeably larger than the vertebrae from the northern sites.

Table 7.13 Fish Remains, Dhadimagi Havitha (Mirani Litster)

Taxon	XU 1	
	NISP	MNI
Elasmobranchii	7	7
Fish sp.	9	9
TOTAL	16	16

7.5 Invertebrate Faunal Remains: Results and Analysis

Invertebrate remains were recovered from Kuruhinna Tharaagadu and Nilandhoo Foamathi; however, not from southern sites of Bodu Havitha or Dhadimagi Havitha. The invertebrate remains include molluscs and small amounts of urchins and crustaceans.

7.5.1 Molluscan remains

Shellfish recovered from either Kuruhinna Tharaagadu or Nilandhoo Foamathi was likely unrelated to consumption but to shell money. Large quantities were returned from the sample obtained from Kuruhinna Tharaagadu and the Nilandhoo Foamathi assemblage and the results are reported here.

Table 7.14 Absolute frequency of molluscan remains (MNI), Kuruhinna Tharaagadu (data from Mikkelsen 2000)

Taxon	Feature							X-Y-Coordinate		MNI
	2	10	17	18 C/B	20/21	26	42	x91.3/y95.0	x118/ y135	
<i>Monetaria moneta</i>	62,000	0	106	0	0	1	1	218	0	62435
<i>Tridacna maxima</i>	0	17	1	1	1	0	0	0	1	21
Unidentified	0	2	0	0	0	2	0	0	0	4
MNI	62,000	19	107	1	1	3	1	218	1	62,460

Table 7.14 reports the results of the molluscan analysis from the monastery site of Kuruhinna Tharaagadu. Only two species were identified in the sample, from the families Cypraeidae and Cardiidae. The total number of shells equalled an MNI of 62,460.

Kuruhinna Tharaagadu housed both large and small deposits of cowry shell throughout the complex—specifically *Monetaria moneta*, with the largest deposit numbering 62,000 individual shells by MNI. This was clearly an intentional deposit and could represent a variety of purposes which have been discussed in the previous Chapter Five (e.g., ‘donation’ to the monastery or the collection of funds). Direct shell dates have been retrieved from six cowry shell deposits and are discussed in Chapter Five. These range from 700CE–1297CE (95.4%), although as mentioned previously a caveat about the need for a local correction value is needed. Additional further deposits of *Monetaria moneta*, recovered from the western portion of the complex post-date the introduction of Islam, and as such would not be associated with the occupation of the Buddhist monastery, and could potentially be cowry processing sites in the area. These are also dated (1530 CE onwards), which is closer to the collapse of the shell money industry (1800s). The total number of *Monetaria moneta* returned from the sample obtained from the excavations of the site equalled an MNI of 62,435.

Tridacna maxima deposits were also recovered from the base fill of many of the features of the monastery and as mentioned previously Mikkelsen (2000) suggests this supports their ritual useage during construction phases.

The shellfish assemblage recovered from Nilandhoo Foamathi was dominated by gastropods and had a greater species diversity than the sample from Kuruhinna Tharaagadu (NISP=15). Most gastropods were from the Cypraeidae family (MNI=357) and included: *Monetaria moneta*, *Cypraea tigris*, *Monetaria annulus*, *Ovatipsa chinensis*, *Palmadusta asellus assellus* and *Monetaria caputserpentis caputserpentis*. *Monetaria moneta* was the most dominant (MNI=279 or 78.1%), with two particularly large amounts recovered from XU 7 and 10 of Feature 4. Owing to the lack of burning or fractures in the Cypraeidae specimens from this site, and their high lustre and small size, these shells would likely have served as shell money. One

larger cowry shell (*Ovatipsa chinensis*) from XU 11 was intentionally marked with four distinct lines, suggesting some unknown significance.

Other shellfish present include *Tridacna maxima* (MNI=3). Molluscs from the Strombidae family, included *Strombus* sp., *Lambis lambis* and *Lentigo lentiginosus* (MNI=2). Turbinidae was present, with *Turbo* sp., *Turbo* sp. opercula, and *Turbo mamoratus* (MNI=3) represented. Conidae was also represented with a singular juvenile *Conus barthelemyi* (MNI=1). Bivalves were sparse when compared to gastropods, with *Bivalvia* sp. (MNI=5) and *Periglypta puerpera* present (MNI=1).

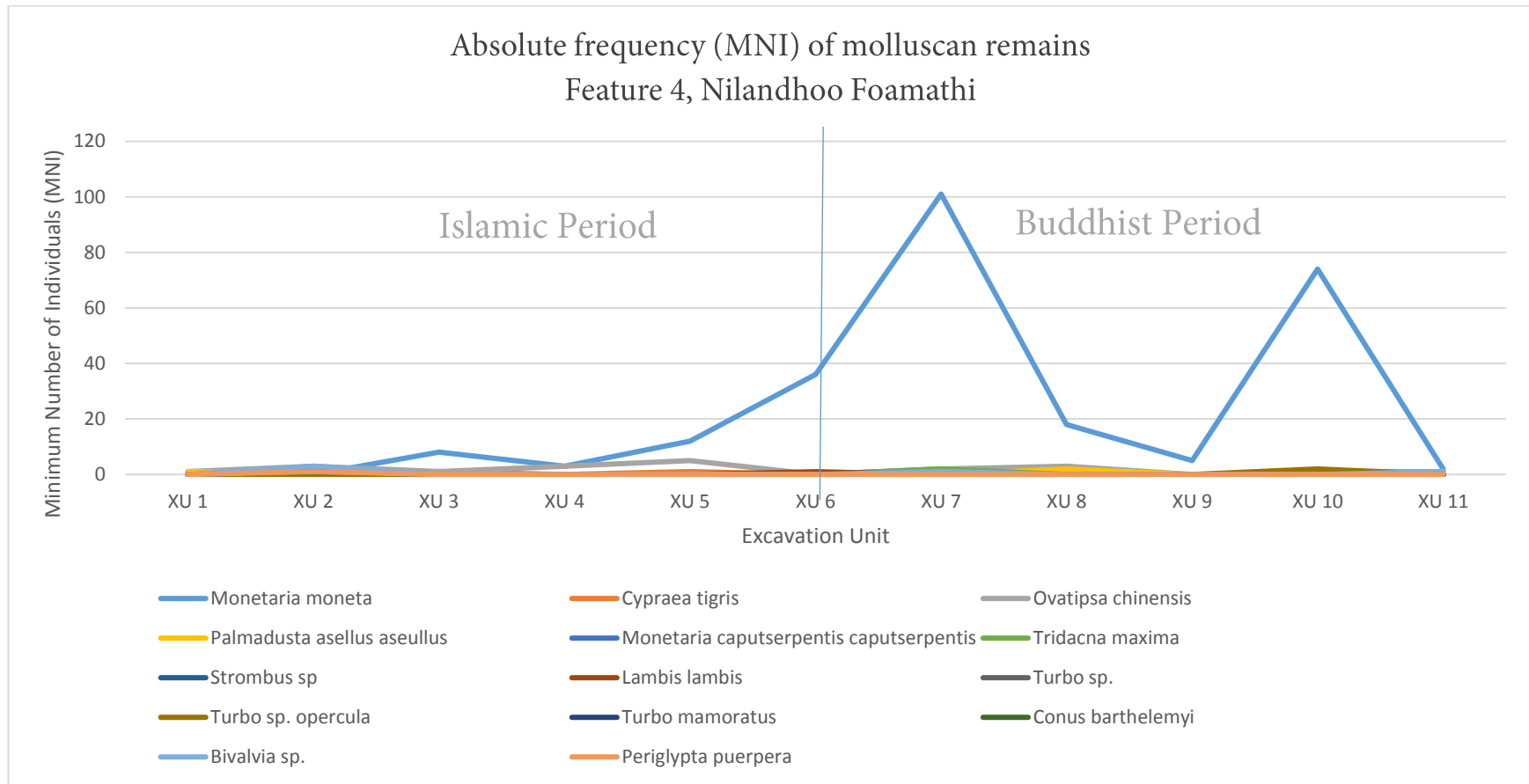
All shells were associated with the reef-intertidal zone, the exception being extremely small quantities from the sand-intertidal zone (*Conus barthelemyi* and *Periglypta puerpera*), suggesting most shells were foraged from reef zones. The absolute frequency of molluscan remains seen in Fig. 7.14 illustrates that *Monetaria moneta* was the most frequently occurring taxa, and tended to be deposited in disproportionately large quantities. This was more pronounced in the earlier Buddhist period, with larger deposits seen in XUs 7 and 10.

7.5.2 Crustacean and Urchin

Very small quantities of crustacean and urchin were recovered from sites in the Maldives. Minimal crustacean was recovered from the assemblages, except for one claw piece from XU 2, Feature 4, at Nilandhoo Foamathi. A small deposit of urchin was also recovered at Nilandhoo Foamathi (n=28) also from XU2 of Feature 4.

Table 7. 15 Absolute frequency of molluscan remains (MNI) Nilandhoo Foamathi cont. (Mirani Litster)

	Feature 1	Feature 4 (XU)																				MNI		
	XU1	1	2	3	4	5A	5C	6A	6C	7A	7C	8A	8C	9A	9B	9C	10A	10B	10C	11A	11B		11C	
<i>Tridacna maxima</i>	1	0	0	0	0	0	0	0	0	1	1	<1	0	0	0	0	0	0	0	0	0	0	0	3
<i>Strombus</i> sp.	0	0	0	0	0	0	0	0	0	0	0	<1	0	0	0	0	<1	0	0	0	0	0	0	0
<i>Lambis lambis</i>	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
<i>Turbo</i> sp.	0	0	<1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<i>Turbo</i> sp. opercula	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	2
<i>Turbo mamoratus</i>	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
<i>Conus barthelemyi</i>	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
<i>Bivalvia</i> sp.	0	0	3	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	5
<i>Periglypta puerpera</i>	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Unidentified	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	<1	<1	0	0	0	0	0
MNI	26	2	10	10	6	15	3	36	1	105	3	19	5	1	1	3	60	9	8	2	2	1	328	



*Figure 7. 14 Absolute frequency (MNI) of molluscan remains Feature 4, Nilandhoo Foamathi
Credit: Mirani Litster*

7.6 Summary

In summary, the results presented in this chapter provide a better understanding of the marine and terrestrial faunal resources exploited in the Maldives. The presence of rat bone in deposits at Nilandhoo Foamathi dated to 775–968 CE (95.4%) provides a *terminus post quem* for rat in the Maldives—this predates the only known historical reference to rat in the archipelago dated to c. 1900 and suggests introduction by at least 968 CE. Likely chicken bone found in recent layers at Nilandhoo Foamathi is associated with the more recent Islamic period. Turtle remains were recovered across Maldivian sites ranging from the Buddhist to Islamic period. The initial identification of *Aldabrachelys gigantea* at Kuruhinna Tharaagadu (Mikkelsen 2000) was discussed and further research needs to be conducted to confirm the presence of this species in the Maldives during the early human occupation phase. In terms of fishing, Maldivians historically have relied on pelagic resources; however, reef fishing occurs when this is not possible. The presence of reef and pelagic taxa were found throughout all occupation phases, with a greater diversity and number of reef taxa in the more recent period.

Molluscs recovered from Maldivian excavations were not associated with consumption, but shell money. The earliest date from a large cowry deposit was 700–990 CE (95.4%) at Kuruhinna Tharaagadu, with a range of direct dates on similar deposits at the site. Feature 4 of Nilandhoo Foamathi returned deposits of *Monetaria moneta*, during Buddhist period contexts. *Tridacna* sp. was found in a ritual context associated with the bases of construction at Kuruhinna Tharaagadu. This ritual use of molluscs is potentially illustrated further by the find of a single cowry shell with four intentional incisions from the lowermost layer of Feature 4 at Nilandhoo Foamathi. The implications of the faunal analysis for the Maldives is further examined in Chapter Nine, with the main points including:

1. Large quantities of *Monetaria moneta* were recovered from dated contexts, which provide early dates for their distribution;
2. Large quantities of *Monetaria moneta* were found in the Buddhist period, with likely processing sites identified in the later Islamic period (at Kuruhinna Tharaagadu);

3. A long-standing preference for tuna in lieu of inshore reef taxa or introduced fauna such as chicken is evident which could be indicative of ‘re-embedding the local’ a hallmark of globalization; and,
4. Introduced taxa is mainly associated with the period of Arab trade, potentially indicating increasing interaction during this period.

The next chapter, Chapter Eight, presents the methods and results of the analysis of the diverse non-ceramic material culture classes recovered from the Maldivian sites. This includes: beads, glasses, metals, stone artefacts, and coral stone carvings.

8

Non-Ceramic Material Culture and Glass

8.1 Introduction

A diversity of non-ceramic artefact classes were recovered although mostly in small quantities from the sites excavated and surveyed, including: personal ornaments, glass fragments, metal fragments, metal artefacts, coins, stone artefacts and carved stone was the most abundant class of artefact represented in Maldivian assemblages. This category does not include the structural features, but the moveable objects such as decorative masonry stones, votive stupas and statues. All classes were present at all sites, except for stone artefacts which were only present at Kuruhinna Tharaagadu.

The analysis of this diverse set of artefacts contributes to an understanding of both the early occupation period and the use of the Maldives during early globalization episodes. As with the ceramic material culture, all glasses, metals and lithics had to be imported to the Maldives and represent useful exogenous material culture classes to analyze. The presence of these objects in dated contexts presents an opportunity to not only examine early trade networks, but also how these items were used by the Divehi population. The examination of the carved stone is especially useful in terms of exploring the second research aim, in that it provides insight into the use of locally sourced material to construct and interpret a global culture's artistic traditions for the local Maldivian Buddhist population.

All artefacts are detailed below by type. Each artefact section contains methods used to classify each artefact and generate the descriptive results per class. A summary of all artefacts recovered and general observations concludes the chapter.

8.2 Personal Ornaments

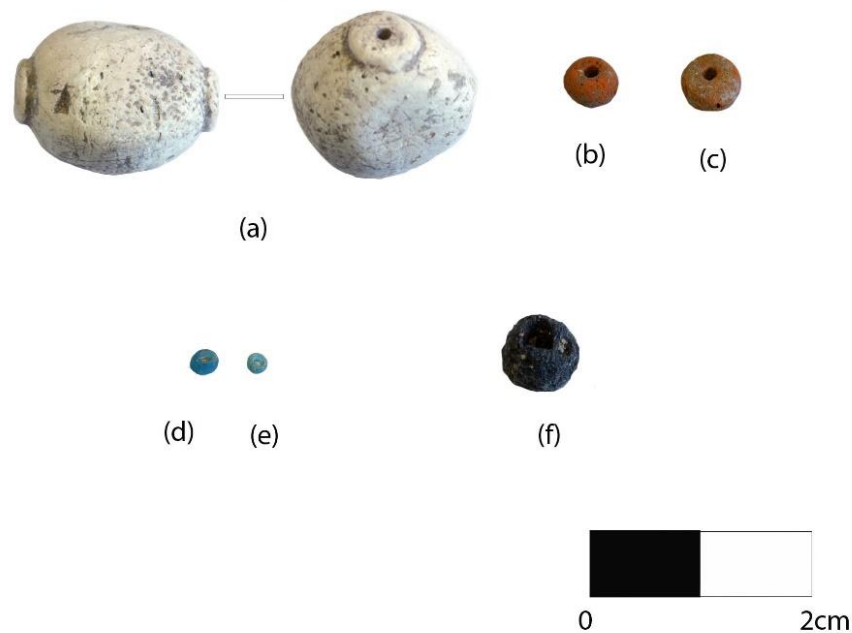
Personal ornaments have been recovered from all sites included in this research. This includes beads manufactured from a variety of materials, metal finger rings and metal bracelets.

8.2.1 *Beads and small ornaments*

Beads and small ornaments have been recovered from all Maldivian archaeological sites except the southern Dhadimagi Havitha. A wide diversity and profusion of beads have been recovered from archaeological sites throughout the Indian Ocean from the earlier periods through to the second millennium CE including: carnelian, Indo-Pacific beads, glass beads and shell beads (Wood 2012). Typically, these items have been used in discussions, similar to the manner in which pottery has been used—as a proxy to better understand connectivity and trade in the Indian Ocean (Seland 2014). These arguments tend to be based on the morphological characteristics alongside the results of chemical characterization (cf. Wood 2012).

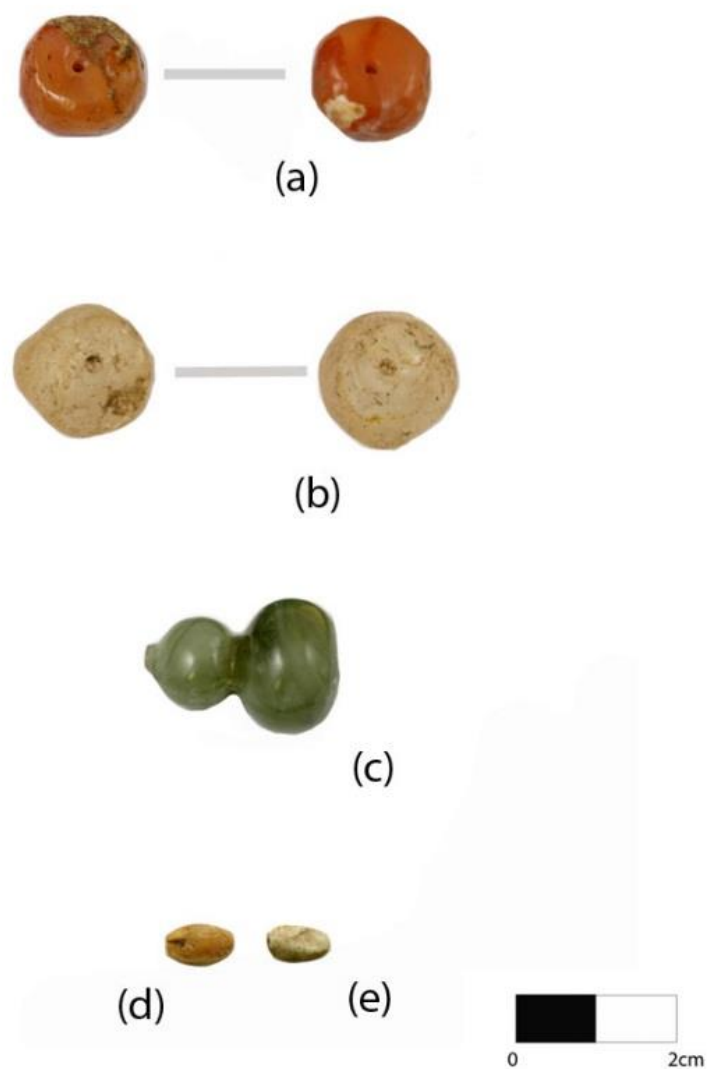
Beads were excavated or collected during surveys conducted in the Maldives and returned to Oslo, Norway. The beads from Nilandhoo Foamathi, Bodu Havitha and Vadhoo Island were returned to the Kon-Tiki Museum, whilst the beads from Kuruhinna Tharaagadu were returned to the University of Oslo. The beads from Nilandhoo Foamathi and Bodu Havitha were analyzed at the Kon-Tiki Museum in 2010 by Mirani Litster. The beads from Vadhoo Island were loaned to the Australian National University in 2011 for further analysis by Mirani Litster. The beads from Kuruhinna Tharaagadu were analyzed at the University of Oslo in 2010 by Mirani Litster. Beads from Vadhoo Island were subjected to analysis by pXRF in the Department of Archaeology and Natural History, Australian National University by Christian Reepmeyer. Usewear analysis was also conducted on the carnelian and quartz beads from Vadhoo Island by Catherine Frieman of the School of Archaeology and Anthropology, Australian National University. The carnelian was also subjected to preliminary LA-ICP-MS by Mathieu Leclerc (School of Archaeology and Anthropology, Australian National University).

The beads were assessed by attributes, where the morphological characteristics of the beads were recorded. This system was tailored from Wood (2011:68), which built upon foundation studies such as Beck (1928), Karklins (1985) and Kidd and Kidd (1970). These early studies were originally established to simplify bead cataloguing and to record monochrome glass beads. The application of this classification system to the beads recovered from the Maldives enables an assessment of diversity among the assemblage but also the ability to contextualize the descriptive results in broader Indian Ocean bead studies. This system of recording was also tailored to incorporate beads constructed of different raw material types. Each bead was given an artefact ID, followed by recording the: context, colour (derived from Munsell colour), number of fragments, manufacture method (MM), structure, shape, size and length designation, end treatment, diaphaneity and lustre. The results are presented in Table 8.1.



*Figure 8.1 Beads from Kuruhinna Tharaagadu Archaeological Site
(a) coral stone bead, Feature 7; (b) and (c) clay beads, Feature 49; (d) and (e) glass
beads, Feature 47 and (f) black coral bead, Feature 26.*

Credit: Mirani Litster



*Figure 8.2. Beads and small ornaments from Vadhoo Island Archaeological Surveys
(a) carnelian bead (b) quartz bead (c) lead glass gourd object (d) and (e) shell
beads*

Credit: Mirani Litster

Table 8.1. Beads and small ornaments from Maldivian archaeological sites (Mirani Litster)

Key: KT=Kuruhinna Tharaagadu, NF= Nilandhoo Foamathi, VI= Vadhoo Island, BH= Bodu Havitha, MM = manufacture method, D = diapheniety, ET = end treatment # = number of fragments, Sm = Small, Med=medium, Lrg = Large, VL = Very large

ID #	Context	Raw Material	Colour	Munsell	#	MM	Structure	Shape	Size	Length	ET	D	Lustre	Patination
1	KT, Feature 7	Coral Stone	Yellow-White	5 YR 9/2	1	Carved	Simple	Barrel	VL	Long	NA	Opaque	NA	NA
2	KT, Feature 49	Clay	Moderate Red	2.5R 4/8	1	Moulded	Simple	Oblate	Med	Short	NA	Opaque	NA	NA
3	KT, Feature 49	Clay	Moderate Red	2.5R 4/8	1	Moulded	Simple	Oblate	Med	Short	NA	Opaque	NA	NA
4	KT, Feature 47	Glass	Brilliant Greenish-Blue	5B 7/8	1	Drawn	Simple	Oblate	Sm	Short	Hot Tumbled	Translucent -Opaque	Dull	Moderate
5	KT, Feature 47	Glass	Brilliant Greenish-Blue	5B 7/8	1	Drawn	Simple	Oblate	Sm	Short	Hot Tumbled	Translucent -Opaque	Dull	Moderate
6	KT, Feature 26	Coral	Black	NA	1	Carved	Simple	Sphere	Med	Standard	NA	Opaque	NA	NA
7	VI	Carnelian	Yellow-Orange	5YR 6/12	1	Pecked, Diamond Drill	Simple	Oblate	VL	Short	Polishing	Translucent -Opaque	Moderate	NA

8	VI	Quartz	Clear	NA	1	Pecked, Diamond Drill	Simple	Sphere	VL	Short	Polishing	Transparent	Moderate	NA
9	VI	Lead Glass	Very Pale Blue	5B 3/2	1	Moulded	Complex	Other	VL	Long	NA	Translucent -Opaque	High	NA
10	VI	?Cypraeidae	Yellow- White	5 YR 9/2	1	Carved, Drilled	Simple	Barrel	Lrg	Long	Abrading	Opaque	NA	NA
11	VI	?Cypraeidae	Yellow- White	5 YR 9/2	1	Carved, Drilled	Simple	Barrel	Lrg	Long	Abrading	Opaque	NA	NA
12	NF, Feature 2, XU2	Elasmobran- chii vertebra	Yellow- White	5 YR 9/2	1	Carved, Drilled	Simple	Disc	Lrg	Short	NA	Opaque	NA	NA
13	BH, Trench 1, XU2	Coral	Moderate Red	2.5R 4/8	1	Carved	Simple	Oblate	Sm	Short	NA	Opaque	NA	NA

As illustrated in Table 8.1 a very diverse assemblage of beads and small ornaments were recovered from the four Maldivian sites and surveys. This included the excavations at Kuruhinna Tharaagadu, Nilandhoo Foamathi, Bodu Havitha and the surveys of Vadhoo Island. The excavations of Kuruhinna Tharaagadu returned six beads (see Fig. 8.1), including coral-stone, clay, glass and coral beads. The Vadhoo Island surveys resulted in the recovery of four beads (see Fig. 8.2), including a pecked and drilled carnelian bead, a pecked and drilled quartz bead, two abraded ?*Cypraeidae* beads, and a lead glass gourd shaped ornament. Nilandhoo Foamathi returned a drilled *Elasmobranchii* bead (see Fig. 7.13), as discussed in the previous faunal remains chapter. Furthermore, a mosaic glass bead has been misplaced from the assemblage. It was initially excavated from Feature Four of Nilandhoo Foamathi from one of the earliest layers. The excavations at Bodu Havitha returned one red coral bead from XU 2 in Trench 1.

The pXRF analysis on the assemblage from Vadhoo was undertaken by Christian Reepmeyer to identify the raw material based on geochemical element analysis. The quartz bead had been initially identified as topaz (Skjølsvold 1991). Topaz has a chemical formula of $Al_2SiO_4(F,OH)_2$ and quartz a formula of SiO_2 . No aluminium was present in the sample, although silicates were present, indicating it was not topaz and is a form of quartz. The gourd shaped artefact was initially identified as chalcedony; however, the pXRF results found high quantities of lead, indicating it was a lead glass, suggesting a likely Chinese manufacture (Brill 1995). This is confirmed by the gourd shape, which is often found in Chinese archaeological contexts (Braghin and Olschki 2002). The usewear analysis conducted on the two beads from Vadhoo (Artefact ID #7 and #8), indicates that they were both worn and strung as necklaces. Polish is apparent on both faces of the carnelian bead, in addition to the quartz bead.

All beads recovered from Maldivian sites are associated with the earlier Buddhist period, with the exception of those recovered at Vadhoo which can't be assigned to a particular period owing to a lack of stratigraphic context; however, the high diversity of bead types in the assemblage would indicate a large influx of varied beads types were apparent during the early occupation period.

8.2.2 Finger Rings

Several metal personal ornaments were recovered from the sites, these included finger rings and bracelets, with both classes recovered from Kuruhinna Tharaagadu and Dhadimagi Havitha. All finger rings were recovered from Kuruhinna Tharaagadu (see Fig. 8.3). The methods used to generate the descriptive results of the finger rings in Table 8.2, included the recording of the artefact ID, context, style (complex or simple), the width of the segment, raw material type and weight. See Table 8.2 for descriptive results.

Table 8.2 Finger Rings from Kuruhinna Tharaagadu (Mirani Litster)

Artefact ID	Context	Style	Width of Segment (mm)	Raw Material Type	Weight (g)
1	X95/y125	Simple	5	Bronze	0.29
2	Feature 46	Simple	14.7	Bronze	2.0
3	Feature 2	Complex	16.9	Silver	2.16
4	X100/y115 10cm under floor	Simple	7.7	Bronze	0.77
5	Grave 4	Complex	7.5	Silver	0.22

The finger ring recovered from the grave complex was composed of silver and of a more complex type when compared to the rings recovered throughout the rest of the monastery. See (c) and (e) in Fig. 8.3. No further rings were recovered in other Maldivian excavations.

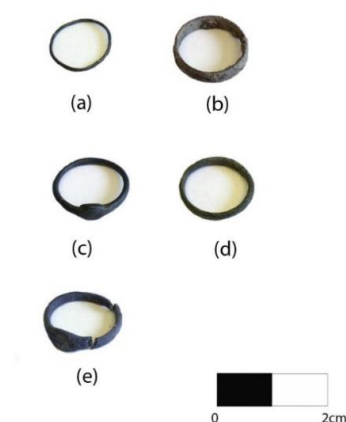


Figure 8.3 Finger rings from Kuruhinna Tharaagadu
Credit: Mirani Litster

8.2.3 Bracelets

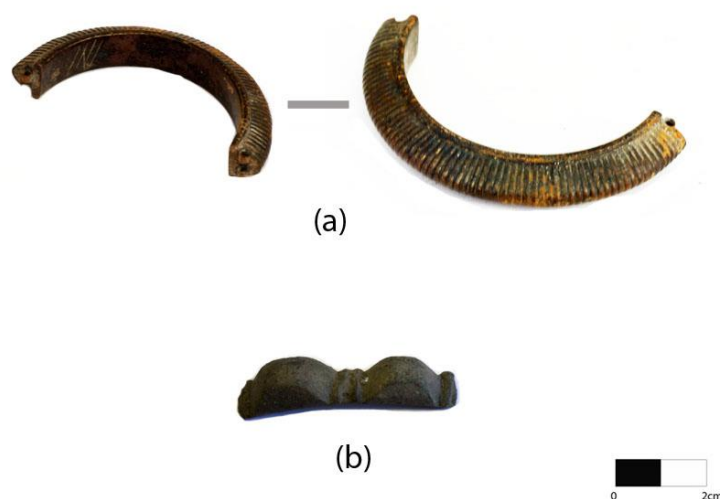
Two bracelet fragments were recovered from the Maldivian archaeological sites, including one from Kuruhinna Tharaagadu and one from Dhadimagi Havitha. The methods used to generate the descriptive results of the bracelets, included recording the: artefact ID, context, style (complex or simple), width of the segment (mm), raw material type and weight. See Table 8.4 for descriptive results.

Table 8.3 Bracelets from Maldivian Archaeological Sites (Mirani Litster)

Artefact ID	Context	Style	Width of Segment (mm)	Raw Material Type	Weight (g)
1	DH	Complex	12	Bronze	16
2	KT, X100, 5/y 113,0	Complex	4.78	Bronze	3.20

Artefact #1 which can be seen in Fig. 8.4 (a) is half of a metal bracelet made of bronze. It was recovered from the undated Layer 1 at the trench excavated at Dhadimagi Havitha. Comparative material can be seen in British Museum ethnographic collections sourced from the Maldives, such as Figs 8.5–8.6. Zoe Bell collected the bracelet pictured in Fig 8.6 in 1939. It is very similar in design to that recovered at Dhadimagi Havitha. The ornaments from the British museum are described as ‘female bracelets’. Francois Pyrard de Laval describes the use of bracelets by Maldivian women:

Their arms are charged with heavy bracelets of silver, sometimes from the wrist up to the elbow; some of them have them mixed with tin, chiefly the poor, while the rest have the fine and massive silver, in such sort that some of them carry as much as three or four pounds of silver on their arms. (de Laval 1887:163).



*Figure 8.4 Bracelets, Dhadimagi Havitha and Kuruhinna Tharaagadu
Credit: Mirani Litster*



Figure 8.5 British Museum (AN1360559001)



Figure 8.6 British Museum (As1939,02.15.a)

8.3 Glass Fragments

Twenty fragments of glass were recovered from the Nilandhoo Foamathi site, all from Feature Four. The descriptive results are presented here (see Table 8.4). The methods employed to produce the descriptive results involved recording the thickness, weight and Munsell colour of each sherd, in addition to several further attributes—diaphaneity and patination.

The more recent layers returned olive and brown glass, except for one very light greenish blue sherd. The earlier layers returned different glass colours to those found in contexts that post-date the introduction of Islam. This included light greenish-blue (n=3) types. An additional two brown body sherds decorated with a ‘wavy pattern’, were missing from the collection, from Spits 9 and 10. Skjølsvold (1991) speculated these to belong to a perfume bottle. Most glass fragments belonged to bottles, with the majority being from the body of the vessel, with only two fragments from the neck of a bottle.

Additionally, no patination was evident in the glass assemblage, with most diaphaneity recordings closer to ‘transparent’ and no opaque fragments were recorded in the assemblage. Chemical characterization is recommended as a further avenue of investigation to source and date the glass assemblage from Nilandhoo Foamathi.

Table 8.4 Glass Fragments from Nilandhoo Foamathi (Mirani Litster)

ID Number	Context	Thickness (mm)	Weight (g)	Munsell Colour	Diaphaneity	Patination	Vessel Part
1	NF, Feature 4, XU 2	3.12	6	Olive (5Y 4/4)	Transparent-Translucent	None	Body
2	NF, Feature 4, XU 2	3.92	0.4	Clear (NA)	Transparent	None	Body
3	NF, Feature 4, XU 3	4.32	30	Very light greenish blue (5B 3/6)	Transparent	None	Neck
4	NF, Feature 4, XU 3	5.2	14	Brown (2.5YR 4/4)	Transparent-Translucent	None	Neck
5	NF, Feature 4, XU 3	5.2	12	Brown (2.5YR 4/4)	Transparent-Translucent	None	Body
6	NF, Feature 4, XU 3	5.2	20	Brown (2.5YR 4/4)	Transparent-Translucent	None	Body
7	NF, Feature 4, XU 3	5.2	17	Brown (2.5YR 4/4)	Transparent-Translucent	None	Body
8	NF, Feature 4, XU 4	5.2	14	Brown (2.5YR 4/4)	Transparent-Translucent	None	Body
9	NF, Feature 4, XU 4	5.2	12	Brown (2.5YR 4/4)	Transparent-Translucent	None	Body
10	NF, Feature 4, XU 4	5.2	11	Brown (2.5YR 4/4)	Transparent-Translucent	None	Body
11	NF, Feature 4, XU 4	5.2	10	Brown (2.5YR 4/4)	Transparent-Translucent	None	Body
12	NF, Feature 4, XU 4	5.2	9	Brown (2.5YR 4/4)	Transparent-Translucent	None	Body

13	NF, Feature 4, XU 4	5.2	12	Brown (2.5YR 4/4)	Transparent-Translucent	None	Body
14	NF, Feature 4, XU 4	5.2	4	Brown (2.5YR 4/4)	Transparent-Translucent	None	Body
15	NF, Feature 4, XU 4	5.2	0.7	Brown (2.5YR 4/4)	Transparent-Translucent	None	Body
16	NF, Feature 4, XU 9	4.1	12	Light greenish blue (5B 7/5)	Transparent-Translucent	None	Body
17	NF, Feature 4, XU 9	2.0	7	Light greenish blue (5B 7/5)	Transparent-Translucent	None	Body
18	NF, Feature 4, XU 9	1.8	8.5	Brown (2.5YR 4/4)	Transparent-Translucent	None	Body
19	NF, Feature 4, XU 10	1.8	3	Brown (2.5YR 4/4)	Transparent-Translucent	None	Body
20	NF, Feature 4, XU 10	2.8	12	Light greenish-blue (5B 7/4)	Transparent-Translucent	None	Body

8.4 Metal Fragments

Several metal fragments have been recovered throughout the Maldives, from both Kuruhinna Tharaagadu and Nilandhoo Foamathi. The descriptive results were generated by recording the counts and weights of fragments per unit. Most fragments came from Kuruhinna Tharaagadu (n=29), with two fragments from Nilandhoo Foamathi. All fragments from Nilandhoo Foamathi were copper, whilst those from Kuruhinna Tharaagadu consisted of metal slag, bronze fragments, and fragments of bronze bowl—potentially related to the bronze bowl, in section 8.5 (see Fig. 8.7). The metal slag suggests that kilns, associated with metal-work, were being fired in the area.

Table 8.5 Metal Fragments from Maldivian Archaeological Sites (Mirani Litster)

ID Number	Context	Raw Material	Count (n=)	Weight (g)	Comments
1	Nilandhoo Foamathi, Feature 4, XU2	Copper	1	0.2	Thin and Hammered
2	Nilandhoo Foamathi, Feature 4, XU 5, Section C	Copper	1	1.8	Tubular
3	Kuruhinna Tharaagadu, Feature 30	Bronze	1	1.3	
4	Kuruhinna Tharaagadu, Feature 12	Bronze	1	1.0	
5	Kuruhinna Tharaagadu, x85/y110	Bronze	1	0.8	
6	Kuruhinna Tharaagadu, x108/y123	Metal Slag	1	6.7	
7	Kuruhinna Tharaagadu, Feature 42	Bronze	14	30.2	Fragments from a bronze bowl
8	Kuruhinna Tharaagadu, x90/y125	Iron	1	5.7	
9	Kuruhinna Tharaagadu, Feature 42 (chamber)	Iron	9	6.8	
10	Kuruhinna Tharaagadu, Feature 36	Bronze	1	4.8	Fragments from of bronze bowl
TOTAL			31	59.2	

8.5 Metal Bowl

One large metal bowl was recovered from Kuruhinna Tharaagadu. Table 8.6 details the results. ID Number, Context, Thickness, Rim Diameter, Raw Material and Weight were recorded (See Fig. 8.7)

Table 8.6 Metal Bowl from Kuruhinna Tharaagadu (Mirani Litster)

ID Number	Context	Thickness (mm)	Rim Diameter (mm)	Raw Material	Weight (g)
1	Kuruhinna Tharaagadu	9.89	174.21	Bronze	21



*Fig 8.7 Metal Bowl. Kuruhinna Tharaagadu.
Credit: Mirani Litster*

8.6 Coins

Foreign coins have previously been recovered in small quantities throughout the Maldives, and have often served a secondary function owing to their new economic context (Kemmers and Myrberg 2011). Most of these artefacts have been found inside stupa reliquaries, such as the Roman Denarius located inside the reliquary of the Thoddoo Havitha, alongside another coin, a tubular piece of metal and a human bone in 1958 (Forbes 1984). A punch-hole marked the Roman Denarius indicating it had likely been used as a pendant. It was minted with a picture of Caius Vibius Pansa, in either 90 or 89 BC. Another coin was recovered from Gan in Haddhunmathi Atoll,

also from a Buddhist reliquary. This was a Byzantine coin known to have been in circulation from the fifth and sixth centuries CE (Mohamed 2005:12).

Two coins were recovered during investigations of the Maldivian archaeological sites included in this research. Several attributes were recorded including the: artefact ID, weight, raw material, provenance, primary function, secondary function and tertiary context.

Table 8.7 Coins from Archaeological Sites in the Maldives

ID Number	Weight (g)	Raw Material	Provenance	Primary Function	Secondary Function	Tertiary Context
1	3.65	Bronze	Northern Song Dynasty Emperor T'ai Tsung AD 990-94, China	Currency Coin	NA	Kuruhinna Tharaagadu, x112, y115
2	4	NA	NA	Currency Coin	NA	Nilandhoo Foamathi, Surface Find

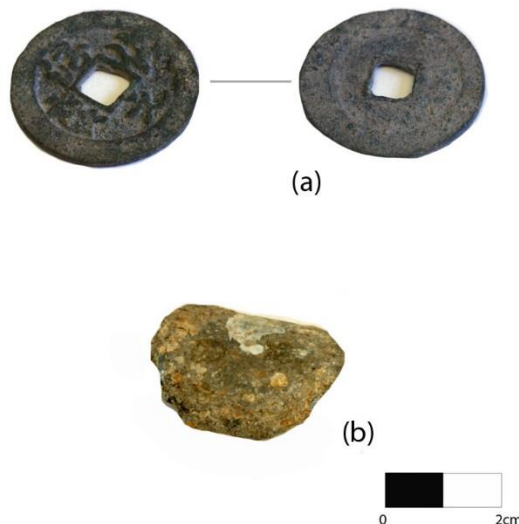


Figure 8.8 Coins from Maldivian archaeological sites

(Credit: Mirani Litster)

The first artefact was found at Kuruhinna Tharaagadu, and is a Chinese coin, belonging to the Northern Song Dynasty, Emperor T'ai Tsung 990–94 CE (Mikkelsen 2000). The second was a surface find from Nilandhoo Foamathi, with such severe weathering, no text or images could be discerned (see (b) in Fig. 8.8).

8.7 Stone Artefacts

Stone artefacts have been recovered in small quantities at Maldivian archaeological sites. The stone assemblage analyzed in this research consists of two grindstones and one unknown stone object. No flaked artefacts are present in the archaeological assemblages and this is very likely to be attributed to a lack of local sources of stone raw materials. A need for imported stone was necessary for processing of local materials. Other materials such as metals for cutting tools and wooden pestles for the processing of local commodities i.e. coconut oil were also imported to the islands. Wooden pestles and metal cutting tools are present in the ethnographic collections acquired in the Maldives in the late 1900s (cf. British Museum Item Numbers As1893.1123.53. a-b; As1893,1123.68).

In order to generate the descriptive results, the artefact ID was recorded, in addition to context, type, raw material, weight, maximum dimension and munsell colour. Artefact #3 was also subjected to pXRF analysis by Christian Reepmeyer in 2011.

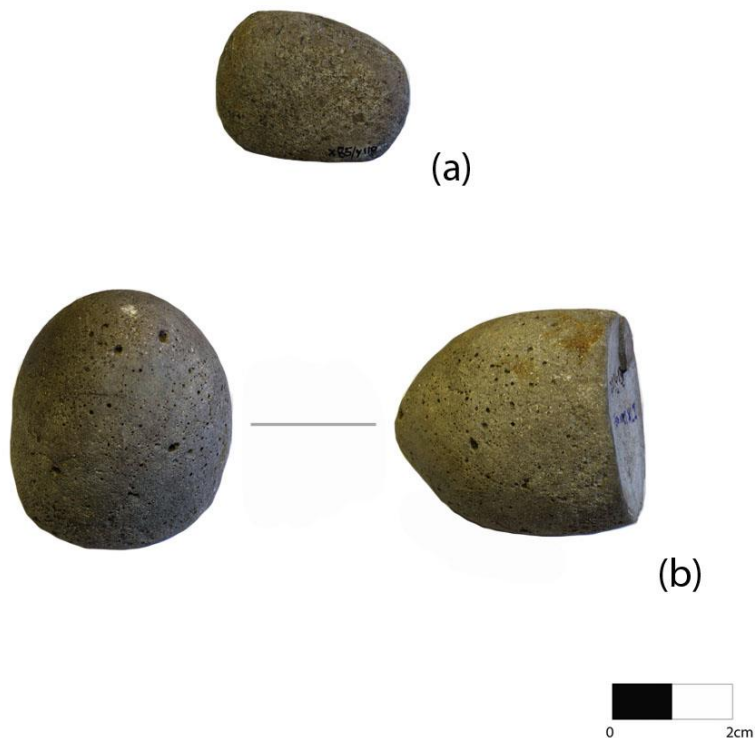
Initially the grindstones from Kuruhinna Tharaagadu were recorded as being composed of volcanic material, with Artefact #2 (a) in Fig. 8.9, listed as pumice. It is unlikely that pumice would be used for heavy grinding, although pumice grindstones have been found in Sana'a, Yemen in 1979, serving a less robust function—a bathing scrubber (British Museum Item Number: As 1979, 01.174). Historical records document the availability of pumice in the Maldives and the Laccadives after 1883, having washed up onshore subsequent to a large volcanic eruption (Gardiner in Ellis 1924:9); however, visual inspection of this artefact would suggest it is basalt.

A final stone artefact (#3) was recovered from Bodu Havitha from a surface context and Skjølsvold (1991) argued that the item was a topaz votive stupa. This may have been the function; however, it may have also acted as a composite element of another

object. The p-XRF analysis confirmed it is not topaz (owing to the lack of aluminium present in the sample) and visual inspection suggests that it is quartz.

Table 8.8 Stone Artefacts from Maldivian Archaeological Sites (Mirani Litster)

ID Number	Context	Artefact Type	Raw Material	Weight (g)	Max Dimension (mm)	Munsell Colour
1	Kuruhinna Tharaagadu, x100,9/y133 East Side Ruin 42	Grindstone	Basalt	132	53.02	Grey (2.5 Y 6/0)
2	Kuruhinna Tharaagadu, x85/y110	Grindstone	Basalt	98	53.22	Grey (2.5 Y 5/0)
3	Bodu Havitha, Surface	NA	Quartz	58	37.09	Yellow-White (5 YR 9/2)



*Figure 8.9 Grindstones from Kuruhinna Tharaagadu
Credit: Mirani Litster*



*Figure 8.10 Quartz Artefact from Bodu Havitha
Credit: Mirani Litster*

8.8 Carved Stone

As outlined in Chapter Four, Divehi stone masonry is a long-established craft working tradition and coral (mainly *Porites* sp.) has been extensively mined for use in construction—it is one of the only building resources, aside from timber, available in the Maldives and many extant historical buildings have been constructed of this fabric (Waheed 2003; Jameel 2012). Population increase and the associated demand on this resource have significantly impacted on coral stocks, especially near the current capital of Male', resulting in the banning of coral mining, which coincided with the introduction of cement in the nineteenth century (Kenchington 1985; Brown and Dunne 1986, 1989; Brown *et al.* 1990; Preu and Engelbrecht 1991; Shepherd 1992; Naseer 1993).

Three types of previous coral stone construction are evident in historical structures and carved stone objects. These include the *Hirigaa* construction, common in the building of mosques and other structures, this technique involves the use of interlocking *Porite* sp. coral blocks, more common between the sixteenth and eighteenth century. The second type of construction involved coarsely shaped blocks of coral stone with a high quartz content, locally referred to as *Veligaa*. The coarseness of the raw material did not lend itself readily to decorative carving as they could not easily be dressed. The final type of construction combined coral rubble with lime mortar, a practice introduced during the nineteenth century (Jameel 2012).

Stone carvings from earlier periods have been recovered from the earliest antiquarian and archaeological expeditions during the 1800s, from a range of early period/Buddhist sites (with associated later Islamic period carvings), and the artefact types reported range from votive stupas, coral stone reliquaries, structural masonry, other sculptures and epigraphic records, including a block carved with the earliest known script recovered in the Maldives in Landhoo Island, South Miladhunmadulu (Bell 1940; Mohamed and Tholal 2010:27, 36–38, 42–43; Gippert 2015).

The sites included in this research returned a quantity of carved stone artefacts. These included votive stupas and *chatravali*, both directly associated with the *havitha* and are described in detail below in section 8.8.2. Large quantities of masonry stones were recovered in addition to smaller quantities of carved stones belonging to the ‘other sculpture’ class as discussed in 8.8.3. This included artefacts not falling into the other categories, such as statues, Buddha footprints and other non-structural carvings not associated with the stupa itself. The methods and descriptive results for each category are presented here.

8.8.1 Votive Stupas and Chatravali

Buddhist monastic environments typically contained large quantities of carved stones in the form of stupas and votive stupas, as do the assemblages in this research (Coningham 2001; Fogelin 2006). Votive stupas typically surround the larger stupa—or *havitha*—and are recovered from many Buddhist sites (Fogelin 2013). Their prevalence can also be attributed to the survivability of the stone used to typically construct such objects. Votive stupas exist to commemorate visits to the larger stupa and the earliest votive stupas have been dated stylistically to the first century BCE from Orissa in India (Chauley 2013). They also share features in common with the main stupa, but vary in size and style, and until recently have not featured in archaeological discourse. This artefact type was often disregarded, for example at the excavation of the significant Buddhist site of Bodh Gaya, where they were cleared from the surrounding area (Mitra 1981; Fogelin 2013).

The structure of votive stupas can be seen in Figure 8.11. The larger stupa architecture, informs the smaller votive, and has been previously compared to the different phases of life. A very brief outline begins with the intern of the reliquary, which represents

conception and birth. The covering of the reliquary represents infancy and the raising of the structure suggests childhood (*medhi*), the oval shape represents adolescence (*anda*) and the rise of the tower (*chatravali*) represents coronation and guarding of youth (Chauley 2013).

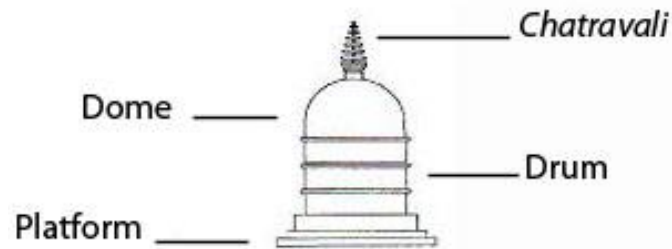


Figure 8.11 Stupa architecture

Credit: Chauley 2013

Votive stupas were recovered from two sites in the Maldives, Nilandhoo Foamathi and Bodu Havitha. The objects were initially excavated and collected at Maldivian sites during the 1983–1984 expeditions. All objects were catalogued in the field and returned to Male'. All votive stupas recovered in the Maldives have been previously separated into 'tower' or 'dome' shaped stupas (Skjølsvold 1991). The 'dome' stupa recovered at Nilandhoo Foamathi was initially confused as a phallus statue (a Hindu *linga*), which is unsurprising owing to their regular reuse as *linga* in other South Asian contexts (Skjølsvold 1991; Chauley 2013). The photographic catalogue was kept at the Kon-Tiki Museum, which enabled classification and recording in Oslo in 2010 by Mirani Litster to reassess the initial analysis, with descriptive results presented in Table 8.9. The following details were recorded: artefact ID, site, feature, context, raw material, classification, height (where available) and diameter of base (where available).

The results indicated that the votive stupas were all constructed of coral stone (n=35). Stylistic and descriptive results are presented in Table 8.9. Most of the votive stupas and *chatravali* would be termed 'monolithic' stupas if recovered from Indian contexts. It is apparent that the sample of votive stupas presented here are far simpler in structure and style than those recovered on the subcontinent (cf. Chauley 2013). What has been previously classified as the 'tower type' by Skjølsvold (1991) are classified here as a

composite *chatravali* element of a votive stupa, or of the larger stupa itself—being the tower or umbrella which rests on the dome of the structure (see Fig. 8.11).

The largest quantity of votive stupa were recovered at Nilandhoo Foamathi where they were found in highest frequencies near Feature 2. It was apparent that the votive stupa were haphazardly deposited there during the destruction of site, likely when Islam was introduced during the twelfth century.

Although a very minimal sample of available measurements could be extracted from the field recordings, if this sample is representative of the whole, the domes had a wider range of base sizes than the *chatravali* (see Fig. 8.13). Figure 8.14 illustrates that the heights of the domes and the *chatravali* were similar.



Fig 8.12 Examples of Chatravali and dome votive stupas recovered in the field

(Left) Dome votive stupa (Right) Chatravali

Credit: Kon-Tiki Museum

Table 8.9 Votive stupas and chatravali recovered from Maldivian archaeological sites (Mirani Litster)

Artefact ID	Site	Feature/ Section	Context	Raw Material	Classification	Diameter of Base (cm)	Height (cm)
1	NF	2	Central part of trench, 30 cm below surface	CS	<i>Chatravali</i>	NA	33
2	NF	2	Central part of trench, 30 cm below surface	CS	Dome	38-45	NA
3	NF	2	Central part of trench, 30 cm below surface	CS	Dome	38-45	NA
4	NF	2	Central part of trench, 30 cm below surface	CS	Dome	38-45	NA
5	NF	2	Eastern extension of trench, east of trench	CS	Dome	38-45	NA
6	NF	2	Eastern extension of trench, east of trench	CS	<i>Chatravali</i>	NA	23
7	NF	2	Eastern extension of trench, east of trench	CS	Dome	NA	NA
8	NF	2	Eastern extension of trench, east of trench	CS	Dome	NA	NA
9	NF	2	Eastern extension of trench, east of trench	CS	Dome	NA	NA
10	NF	2	Eastern extension of trench, east of trench	CS	Dome	NA	NA
11	NF	2	Eastern extension of trench, east of trench	CS	Dome	NA	NA
12	NF	2	Eastern extension of trench, east of trench	CS	Dome	NA	NA

13	NF	2	Eastern extension of trench, east of trench	CS	Dome	NA	NA
14	NF	2	Eastern extension of trench, east of trench	CS	<i>Chatravali</i>	NA	NA
15	NF	2	Eastern extension of trench, east of trench	CS	Dome	NA	NA
16	NF	2	Eastern extension of trench, east of trench	CS	Dome	NA	NA
17	NF	2	Eastern extension of trench, east of trench	CS	Dome	NA	NA
18	NF	2	Eastern extension of trench, east of trench	CS	Dome	NA	NA
19	NF	2	Eastern extension of trench, east of trench	CS	Dome	NA	NA
20	NF	2	Eastern extension of trench, east of trench	CS	Dome	NA	NA
21	NF	2	Eastern extension of trench, east of trench	CS	Dome	NA	NA
22	NF	2	Eastern extension of trench, east of trench	CS	Dome	NA	NA
23	NF	2	Eastern extension of trench, east of trench	CS	Dome	NA	NA
24	NF	2	Eastern extension of trench, east of trench	CS	Dome	NA	NA
25	NF	2	Western wall of southern chamber	CS	Dome	NA	21
26	NF	2	Western wall of southern chamber	CS	<i>Chatravali</i>	NA	NA

27	NF	2	Western wall of southern chamber	CS	<i>Chatravali</i>	NA	NA
28	NF	2	Western wall of southern chamber	CS	<i>Chatravali</i>	NA	NA
29	NF	2	Western wall of southern chamber	CS	<i>Chatravali</i>	NA	NA
30	NF	2	Western wall of southern chamber	CS	<i>Chatravali</i>	NA	NA
31	NF	2	Western wall of southern chamber	CS	<i>Chatravali</i>	NA	NA
32	BH	SE Wall	Fill in front of southeastern wall	CS	Dome	24	27
33	BH	Section 4	Section 4	CS	<i>Chatravali</i>	14	20
34	BH	Section 6	Section 6	CS	Dome	31	18
35	BH	Section 8	Section 8	CS	<i>Chatravali</i>	12	33

(*NF* = Nilandhoo Foamathi, *BH* = Bodu Havitha and *CS* = Coral Stone).

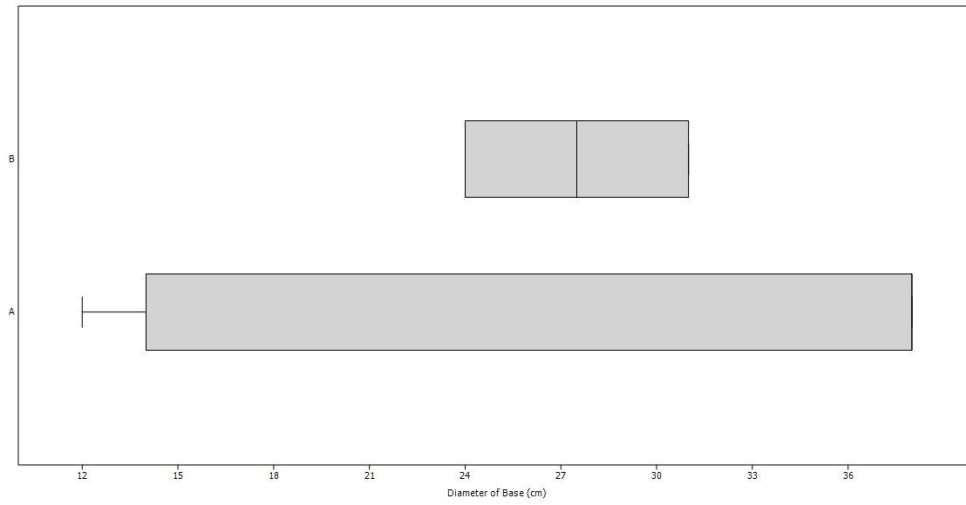


Figure 8.13 Box plot of the diameter at base (cm) votive stupas and chatravali

(A) Dome (B) Chatravali

Credit: Mirani Litster

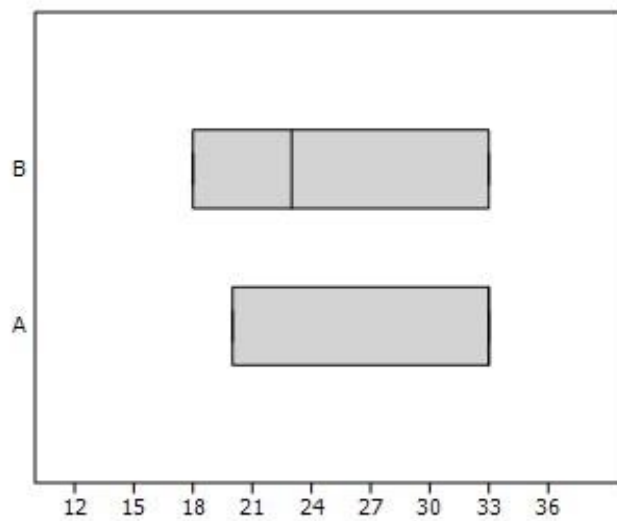


Figure 8.14 Box plot of the height (cm) votive stupas and chatravali

(A) Dome (B) Chatravali

Credit: Mirani Litster

8.8.2 Structural Masonry with Features

Survey and excavation during the NMI identified 149 structural masonry stones in the Maldives including stones from Bodu Havitha, Nilandhoo Foamathi and Vadhoo Island. These types of stone carvings comprised the largest quantity of carved stones recovered during the excavations included in this research. Masonry stones from other sites have also been recovered throughout the Maldives, and some have been returned to the museum in Male', although not included in this research (Mohamed and Tholal 2010:39–41).

The methods used to record the attributes in this research of the structural masonry stones from the NMI involved the following: an artefact ID was assigned, with site and feature recorded. For purposes of classification these pieces of structural masonry have been separated into 'dentilated', 'circular' and 'decorated' categories (see Fig. 8.15 for classification). Some stones have been recovered with no decoration and these are classified 'undecorated'. Raw material was recorded, in addition to context, maximum size (cm), height (cm) and thickness (cm).

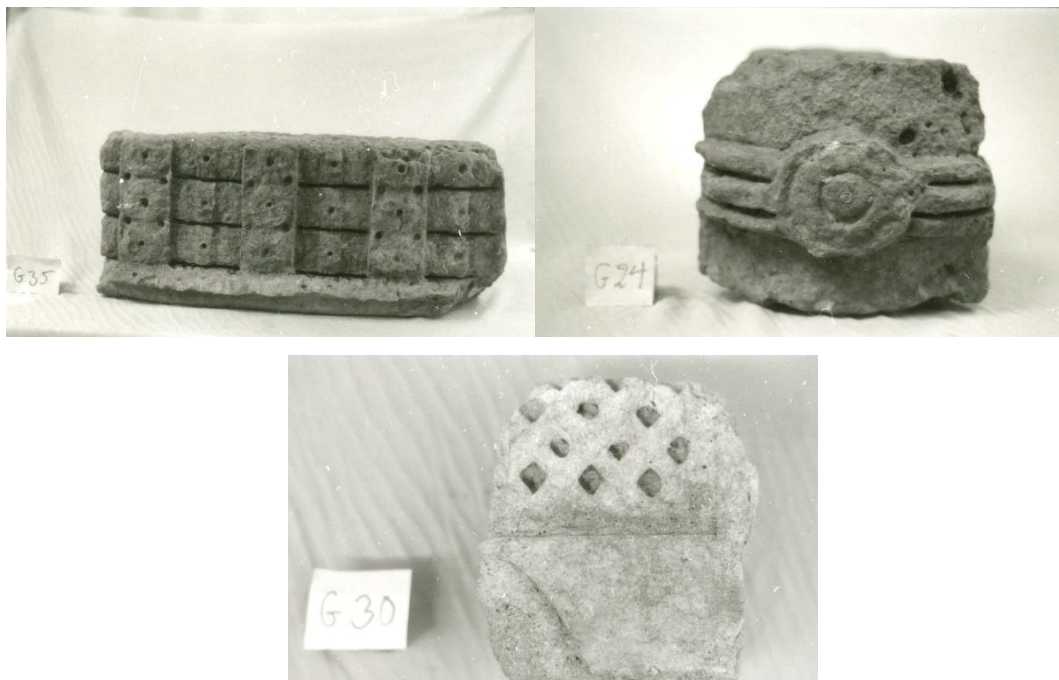


Figure 8.15 Examples of structural masonry types from Maldivian archaeological sites

(top left) dentilated (top right) circular and (bottom) decorated

Credit: Kon-Tiki Museum

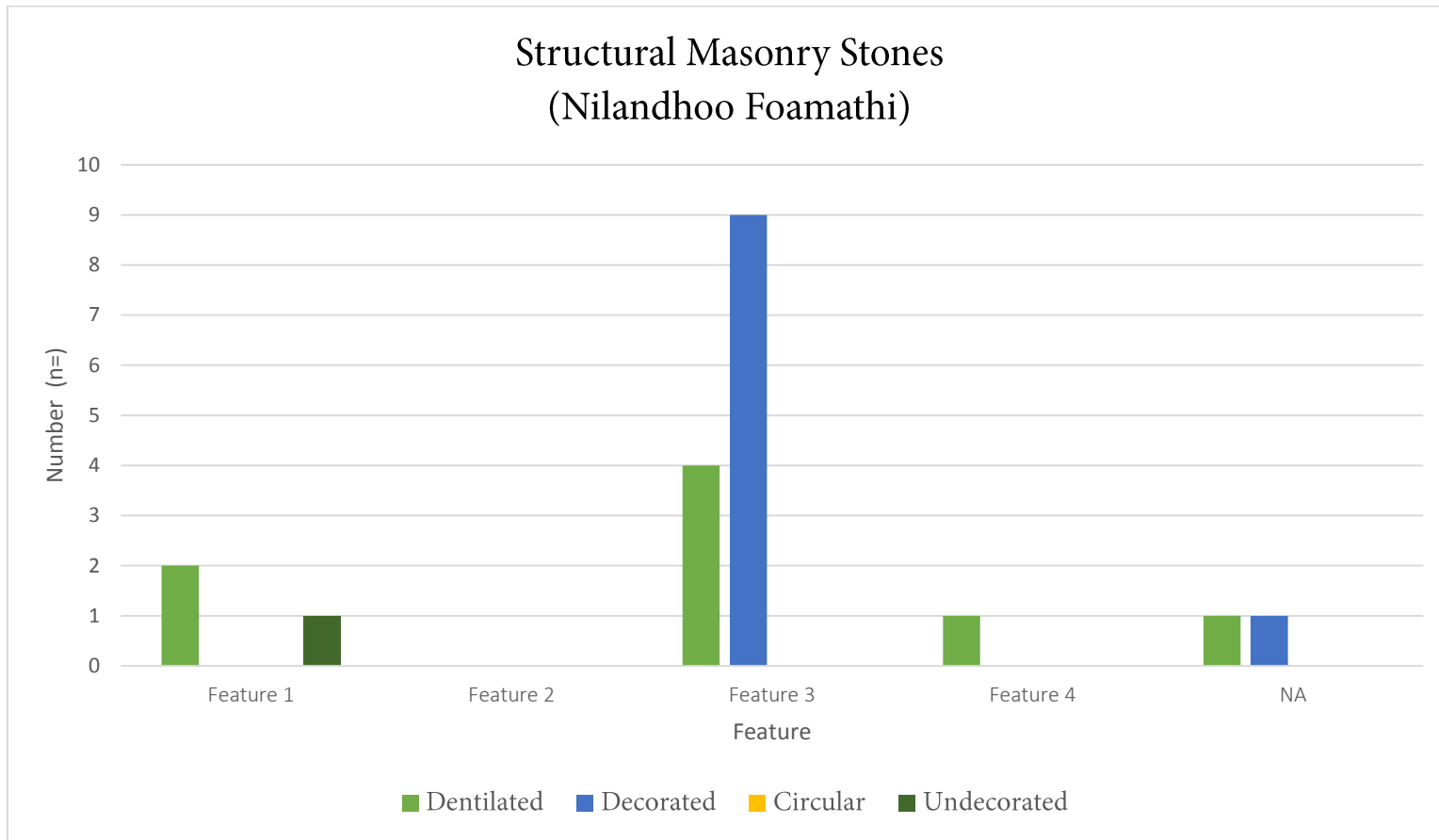


Figure 8.16 Structural Masonry Stones from Nilandhoo Foamathi

Credit: Mirani Litster

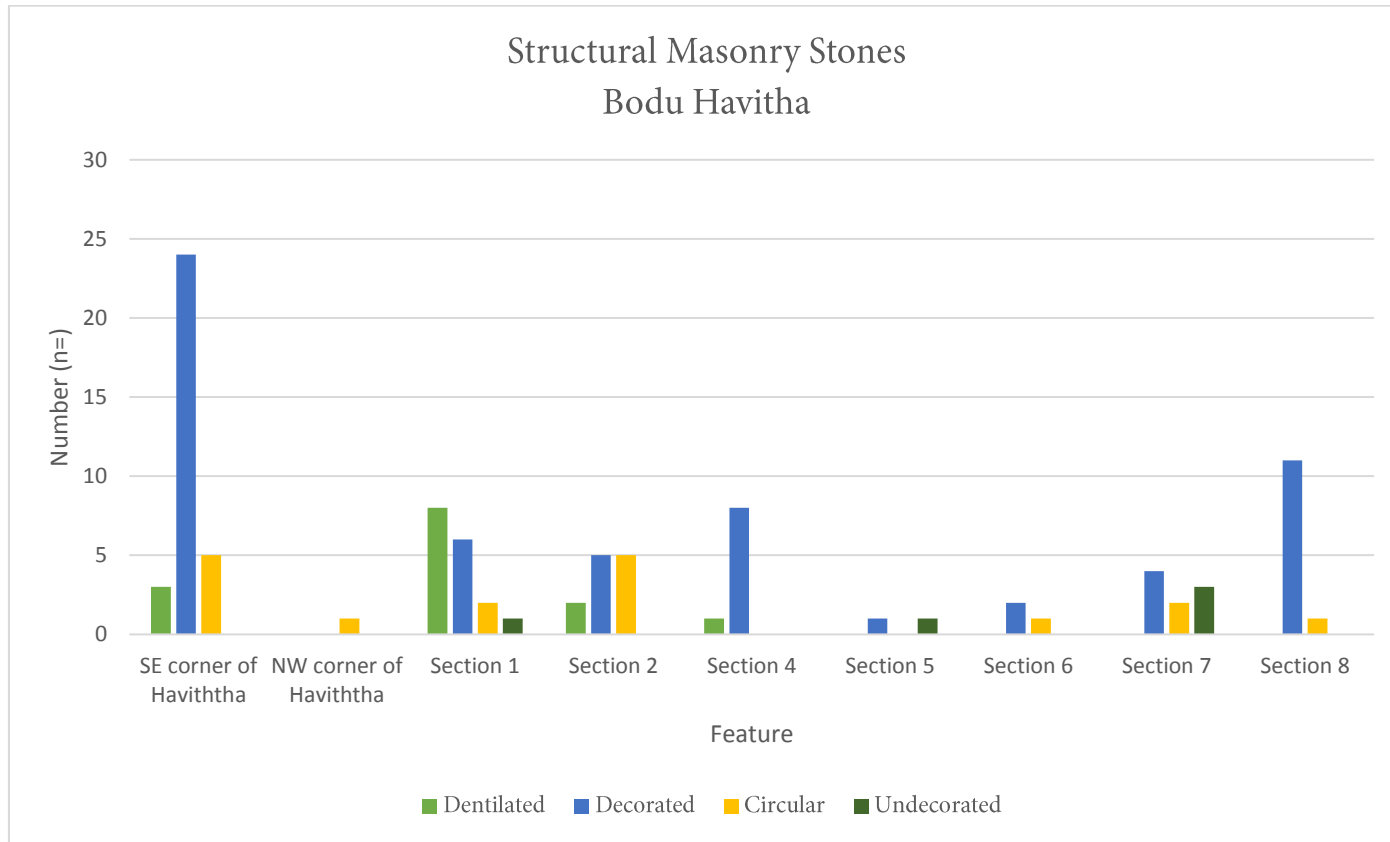
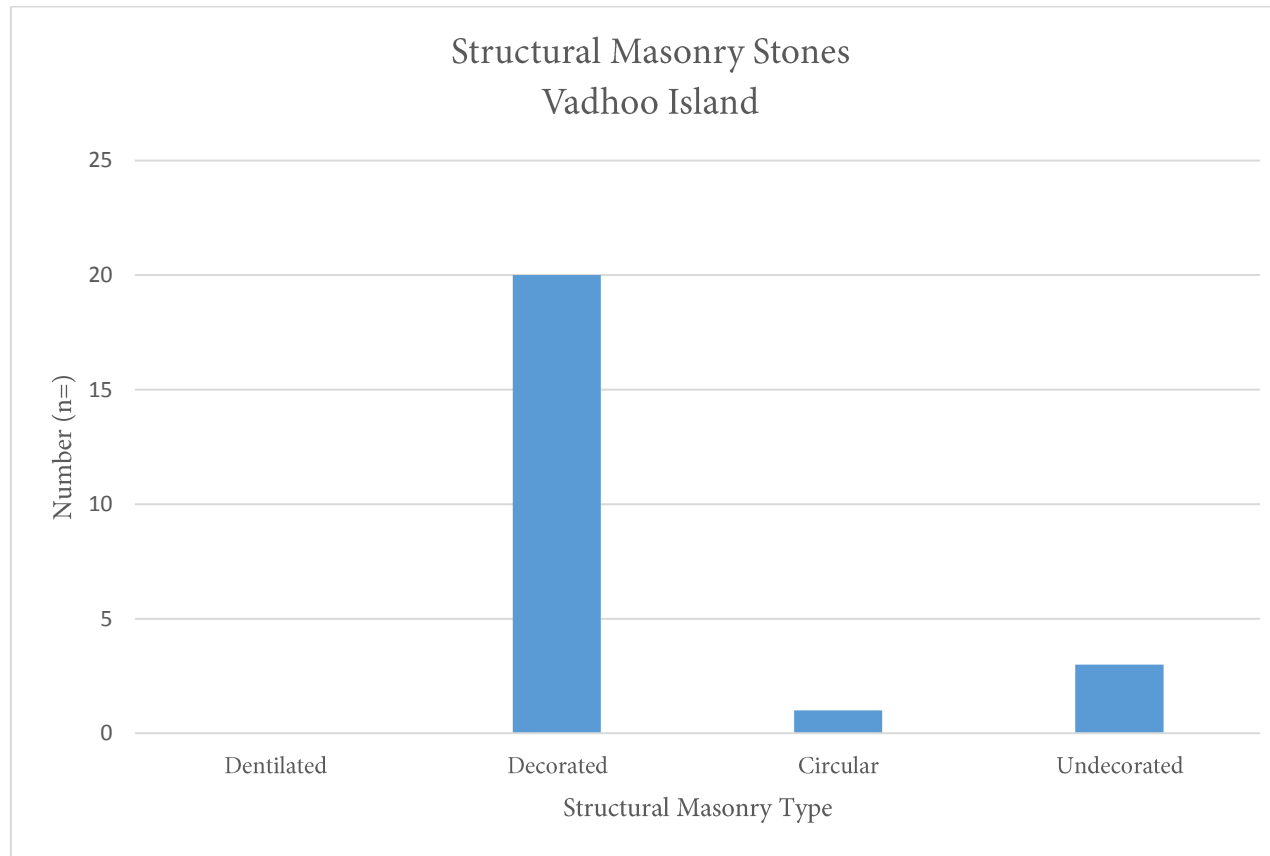


Figure 8.17 Structural Masonry Stones from Bodu Havitha

Credit: Mirani Litster



*Figure 8.18 Structural Masonry Stones from Vadhoo Island
Credit: Mirani Litster*

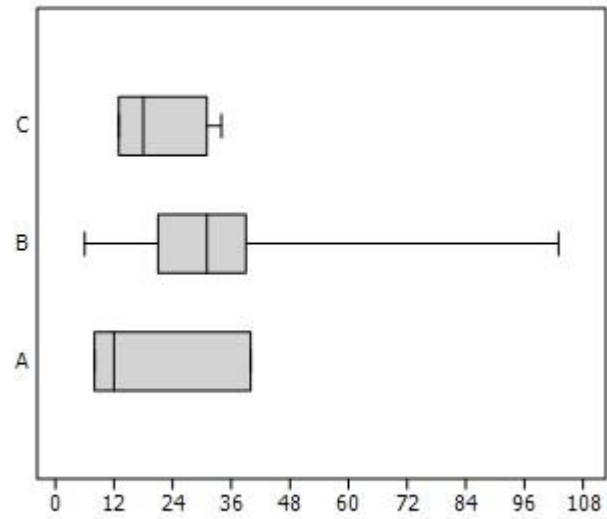


Figure 8.19 Maximum Dimensions of Structural Masonry Stones (cm)

(A) Nilandhoo Foamathi, (B) Bodu Havitha and (C) Vadhoo

Credit: Mirani Litster

There is a lack standardization in design across the sites. Decorated types were the most frequent and represented a diverse category. Nilandhoo Foamathi returned 19 structural masonry stones, Bodu Havitha 97 stones and Vadhoo Island 31 stones. The majority of those from Nilandhoo Foamathi were classified as ‘decorated’ (n=10) or ‘dentilated’ (n=8), with one undecorated. No stones with ‘circular’ decorations were recovered. Bodu Havitha returned ‘decorated’ (n=63) types most frequently, followed by ‘circular’ (n=17) and ‘dentilated’ (n=12) and undecorated (n=5). On Vadhoo island ‘decorated’ types were present (n=20), followed by ‘undecorated’ (n=3) and ‘circular’ (n=1). Dentilated types were not found at Vadhoo, but was recovered from Nilandhoo Foamathi and Bodu Havitha in relatively large numbers. ‘Circular’ designs were found at Bodu Havitha and Vadhoo, but not at Nilandhoo Foamathi.

Additionally, very little contextual information concerning these stones is available, beyond associated features. Only one specimen was recovered in a dated context (#19 Nilandhoo Foamathi). This was associated with the burial of Feature 1, an event which occurred 1170–1423 calCE.

8.8.3 *Other Sculptures*

Sculptures not related to the stupa or structural masonry have been recovered from many Buddhist sites throughout the geographical extent of the religion. Figures often have specific meanings, such as lion statues which are often present to guard the area surrounding the *havitha*—they can also represent manhood (Chauley 2013). In the Maldives, these conspicuous objects have often been subjected to destruction, for example the National Museum in Male’, housed many, prior to the vandal attack in 2012 (Gippert 2015). Fig. 8.20 illustrates two prominent examples, which have been destroyed.

Seventeen sculptures were present at Bodu Havitha, and Vadhoo Island. These figures are detailed in Table 8.10. There are several types of sculpture present including Lion Figures, Buddha Figures, Buddha Footprints, Lotus and Leaf Shapes and are all typical features found in Buddhist art.



Figure 8.20 Sculptures located at the National Museum, Male'. Destroyed in 2012
(source: maldivesculture.com)

Table 8.10 Sculptures from Maldivian archaeological sites (Mirani Litster from Skjølvold 1991).

Site	Context	Sculpture and Description
Bodu Havitha	Section 5	Lion Figure
Bodu Havitha	Section 5	Fragment of Lion's Head
Bodu Havitha	Section 7	Pedestal Like Object
Bodu Havitha	Section 7	Buddha Figure
Bodu Havitha	Section 8	Pedestal Like Object
Bodu Havitha	Section 8	Lion Figure with Head
Bodu Havitha	Section 1	Fragment of Disc Like Stone
Bodu Havitha	Section 4	Floor
Bodu Havitha	Section 7	Lotus Bud
Bodu Havitha	Section 8	Rounded Disc
Bodu Havitha	Section 8	Rounded Disc
Vadhoo Island	NA	Fragment of Buddha Footprint
Vadhoo Island	NA	Fragment of Buddha Footprint
Vadhoo Island	NA	Fragment of Buddha Footprint
Vadhoo Island	NA	Fragment of Buddha Footprint
Vadhoo Island	NA	Fragment of Buddha Footprint
Vadhoo Island	NA	Leaf Shaped Ornamentation

8.9 Summary

The artefact classes covered in this chapter present a diverse range of both internally and externally sourced cultural materials which can be used in discussions about interaction and globalization. Personal ornaments were present at all sites. The carnelian bead likely had a Gujarati origin; however, use of local materials such as the *Elasmobranchii* vertebra and carved coral beads (n=4) indicate local production of decorative materials. Glass fragments were recovered from the central site of Nilandhoo Foamathi from dated contexts, with the earlier layers revealing a blue-green glass, compared to the more frequent yellow-brown glass in the recent layers. Metals were recovered from all sites, except Bodu Havitha. Decorative metals were also found—rings were found in burials at Kuruhinna Tharaagadu and a metal bracelet was recovered from the southern site of Dhadimagi Havitha. Iron, bronze and copper fragments and bowls were found at Nilandhoo Foamathi and Kuruhinna Tharaagadu. Stone Artefacts were present at Kuruhinna Tharaagadu in the form of grindstones. An additional quartz artefact was recovered from Bodu Havitha, either a votive stupa or a potential composite artefact. Carved stone was found at all sites, with structural masonry the most frequent, with most falling into the ‘decorated’ category. Votive stupas were common at Nilandhoo Foamathi and Bodu Havitha, with the most frequent being the ‘dome’ type (at both sites). Further sculptures were present, all with Buddhist iconography such as a Buddha Footprint slab from Vadhoo and a lion statue from Bodu Havitha.

The implications of the analysis of the non-ceramic artefacts for the Maldives is further examined in Chapter 9, with the main points including:

1. An increased diversity of exogenous material culture of all artefact types was present in the later Islamic period, which indicates heterogeneity, a hallmark of globalization;
2. The use of votive stupa and chatravali as on the mainland in India and Sri Lanka is another indicator of globalization—cultural homogenization;
3. The use of lions in Maldivian sculptures, being a completely exotic animal, accords with mainland Buddhist practices—also indicating cultural homogenization; and,

The next chapter, Chapter Nine, discusses the results generated in the preceding chapters within a global cultures framework.

9

The Maldives, Interaction and a Global Culture

9.1 Introduction

Approaches to studying contemporary globalization such as world systems theory, global-capitalism, the network society, transnationality and their limitations were outlined in Chapter Two. The study of past globalizations requires an approach capable of understanding the inherently variable nature of the phenomenon by examining it from multiple perspectives and one which recognizes that globalization is an ongoing process that in many instances connects the prehistory and history of island societies (see. Fig. 2.3). To identify a period of globalization it is necessary that two main criteria be fulfilled. The first is that a surge in interregional interaction has occurred—this has often been used by archaeologists as a marker of globalization, but the model employed here, adopted from Jennings (2011) also requires the subsequent formation of a ‘global culture’ to be identified. A global culture can be identified by examining eight hallmarks that have been used by scholars to discuss contemporary globalizations and therefore can be viewed as convincing markers of globalization in antiquity. These indicators were outlined in Chapter Two, and will be explored in more detail below (see Section 3) by synthesizing results generated in previous chapters. These attributes include: time-space compression, deterritorialization, standardization, unevenness, cultural homogenization, cultural heterogeneity, re-embedding of local culture and vulnerability.

9.2 Surging Interaction in the Indian Ocean

As noted in Chapter Three, the period between the first millennium BCE and first millennium CE in the Indian Ocean was defined by an increasing demand for preciosities such as frankincense, spices and beads, which resulted in the proliferation

of trade entrepôts, such as Arikamedu and Mantai in South Asia, the centres of Southeast Asia and ports in the Gulf, East Africa and the Red Sea. The development of Indo-Roman trade and extensive trading links between South and Southeast Asia, in addition to Buddhist pilgrimages from east to west and vice versa, the rise of Islam in the Hijaz in the seventh century CE, alongside the Swahili trade centre development and Austronesian expansion meant that the Indian Ocean, a *mare liberum*, had become a truly interregional space and it was the export of cowry shell that best defines Maldivian interaction with other Indian Ocean societies during this period.

The archaeological results from the Maldivian sites of Kuruhinna Tharaagadu, Nilandhoo Foamathi, Bodu Havitha, Dhadimagi Havitha and Vadhoo Island indicate changes in interaction that are outlined in a schematic diagram (see Fig. 9.1). Several different data sets have been used to pinpoint increases in interaction: ceramic source and style diversity, cowry shell money deposits and faunal assemblages.

A noticeable influx of foreign ceramics occurs in the post-Islamic period, when an increasing quantity and stylistically diverse assemblage consisting of East Asian (e.g. Longquan Celadon and other high fired trade wares) and West Asian (e.g. Sasanian-Islamic) ceramics is found in Maldivian sites. For example, in archaeological sites of the early Buddhist period no East Asian ceramics have been recovered. The increasing diversity of ceramics present in the more recent period occurs in all sites suggesting increasing trade connections with a variety of foreign locations. Although the possibility that all this material was being exported from a single South Asian trade centre is hypothetically possible, the presence of ceramics from many locations nonetheless illustrates cosmopolitan trade in the region.

The collection of cowry shell money deposits at Maldivian archaeological sites suggests the stocking of the shells for the purposes of trade, whether locally or internationally. Cowry shell money deposits in Maldivian sites are found in greater quantities in the early occupation period, with the largest deposits at Nilandhoo Foamathi and Kuruhinna Tharaagadu. Radiocarbon dates at Nilandhoo Foamathi associated with the largest deposits include 393–552 CE and an age closer to the transition to Islam at 975–1028 CE. The cowry deposits from Kuruhinna Tharaagadu

range from the early period through to the early introduction of Islam, with the largest deposits similarly associated with the early Buddhist occupation. The historical record of cowry shell export also illustrates an increasing importance during the period of the Transatlantic Slave Trade (post 1400s), when *Monetaria moneta* was in high demand in the West African region. These results suggest that interaction in the region was increasing during the early Buddhist phase with another later increase during the Islamic period, coincident with the establishment of the Transatlantic Slave Trade.

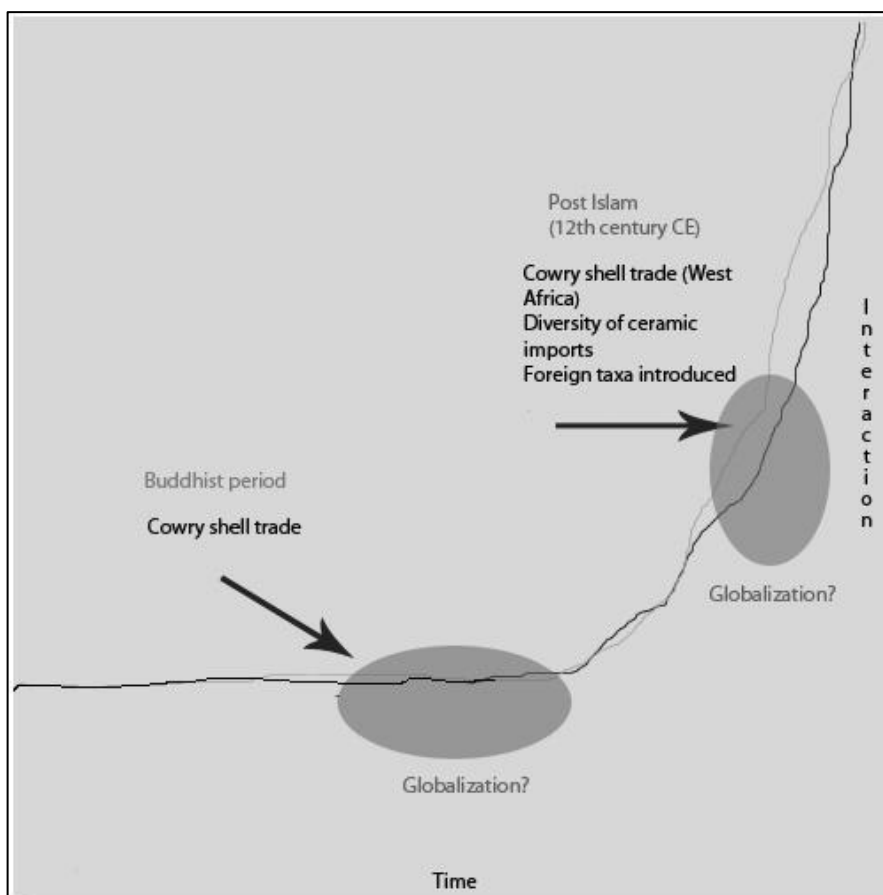


Figure 9.1 Increases in interaction (schematic).

Grey line indicates ceramic diversity (style and provenance) and black line indicates production and processing of cowry shell money in the Maldives based on archaeological results presented in this thesis

Credit: Mirani Litster

The final data set is the non-fish vertebrate faunal assemblage. Introduced taxa was minimal in quantity and type and included small quantities of rat and chicken. Whilst rat bone has been found in Buddhist period contexts, chicken was only found in the later Islamic period deposits. The arrival of chicken in the later period could indicate increased interaction in the region, especially when contrasted with the absence of

domesticates in the earlier periods, although this could be in an issue associated with sample size.

These results in conjunction with the interaction data presented in Chapter Three, indicate that there perhaps were two surges of interaction in the region which manifested, first, during the dispersal of Buddhism, and second, with the dispersal of Islam throughout the Indian Ocean and in the Maldivian archipelago specifically (see Fig. 9.1).

9.3 Formation of a Global Culture

This section overviews each of the hallmarks identified by Jennings (2011) as characteristic of early global cultures. Not all 'hallmarks' are present in the archaeological record and therefore this section also draws on the historical and ethnographic information presented in Chapters Three–Eight. Increasing interaction identified during the first millennium CE should result in the development of hybrid identities or a 'global culture' if the Maldives were in fact involved in an early globalization. The hallmarks will be discussed below regarding the two hypothesized interaction surges detailed above. Global cultures are 'complex, overlapping, dynamic and often contradictory. Surging interregional interactions force people to adjust to new realities, and these adjustments are often radically different from one person to the next' (Jennings 2011:122). A discussion of these eight characteristics also provides us with a mechanism to explore different interaction processes during the first millennium CE that include: time-space compression, deterritorialization, standardization, unevenness, homogenization, heterogeneity, re-embedding and vulnerability.

9.3.1 Hallmark One: Time-space compression

The first trait is 'time-space compression' which refers to the alteration of time taken to travel or to transfer goods or information. The geographer Harvey (1989) established the term, referring to the manner in which humans have conquered time, for example since the eighteenth century, the impacts of technological innovations such as railroads, steamships and bicycles significantly reduced the time taken to travel, thereby resulting in time-space compression (Warf 2011b). Time-space compression is defined by the level of connectedness and refers to how 'societies are

stretched across time and space [and] how different relational geographies have been constructed and how they change over time, and what these changes mean for the people who make these processes unfold' (Warf 2011a). The causes are multiple, as are the consequences, such as the spread and uptake of technological change (Warf 2010).

Time-space compression is most frequently discussed in terms of the modern era, including its use in archaeology where it is considered the domain of social archaeology (Walsh 1995; Preucel and Meskell 2007; Harrison and Schofield 2012). Exceptions exist such as Laurence and Trifilio (2015) and Jennings (2011) who both highlight that time-space compression did exist in antiquity, although they argue that it did not take on the speed witnessed in the contemporary era. For example, during the expansion of the Roman Empire, communication infrastructure, such as roads and major milestones, increased the speed, volume and frequency of interaction, as did the introduction of the donkey in Mesopotamia (Jennings 2011).

A striking feature of the human history of the Indian Ocean is that the advent of widespread trade occurred earlier than in other regions. The deep structure elements outlined in Chapter Three, such as the monsoon and currents, likely promoted this alongside shipping technology which gave rise to the efficient transport of people and goods across the region. The pervasive interaction demonstrated during the first millennium CE, was most likely enabled and facilitated by the rapid expansion of maritime commerce involving increased cargo capacity and improved vessel technology such as the Arabic *dhow* (Stopford 2009). Therefore, in the Indian Ocean time-space compression would have been contingent on two key variables: knowledge of the Asian monsoon wind reversals (and how to benefit from them), in addition to advances in maritime technology (boats and navigation) to promote oceanic movement.

The first mention of the monsoon can be traced to the Greek writings of Hippalus (45–47CE), and other historical records pertaining to maritime travel that existed during the first millennium CE (Tripathi and Raut 2006). Many documents contain vague or indirect references, but overall it was clear that during the first millennium CE Indian Ocean mariners were aware that seasonal weather patterns assisted long-distance

ocean passages (Tripathi and Raut 2006). Technological advances in boat design and construction also enabled and facilitated such trade, and whilst there were various ship types throughout the Indian Ocean, the lashed-lug technique was uniform across the region and was present in localities from Arabia through to Southeast Asia (from the first millennium CE). This construction method facilitated the ability to make a safe passage across the Indian Ocean, in that the ships were more flexible if running into reef areas.

Chapter Four highlighted the efficacious Maldivian method of ship construction, which is locally referred to as *dhoni banun* ('tying'), and Al Biruni (1030AD) discussed the use of coir rope to fasten planks together (Green 2001; Maniku 2004). Ibn Battuta, who visited the Maldives in 1343, noted that coir lashing was also practiced in India and Yemen and that it was particularly effective when travelling over reefs, as the ships were more 'elastic'. The origins of the *dhoni* have been extensively discussed among scholars, although a 'clear Southeast Asian' design is accepted in current scholarship (Green 2001).

A later period of innovation coincided with the development of astrolabes, quadrants and wooden sextants (Mohamed 2004), which were incorporated into Indian Ocean voyaging, including the Maldives. James Tennant recorded the use of Indigenous charts in the pre-modern era in 1860 and Captain Moresby witnessed Divehi repairing navigation tools likely introduced in the Portuguese period, such as astrolabes, quadrants and wooden sextants in the nineteenth century (Mohamed 2004). The historical record highlights the rapid uptake of these new navigational tools. In the Maldives, the importance of skilled seafaring is also evident with the earliest schools established during the historical period being navigation oriented (Mohamed 2004).

In summary, time-space compression occurred with the selection of a distinctive vessel construction technology that was appropriate for the region (lashed lug), used in effective vessel types (predominately with lateen sails) in conjunction with a deeply embedded navigational knowledge tied to the monsoon winds. A second phase of technological innovation can be seen in the distribution of navigational tools such as astrolabes, quadrants and wooden sextants.

9.3.2 *Hallmark Two: Deterritorialization*

The second indicator of a global culture is related to time-space compression and involves a culture becoming 'increasingly abstracted from a local, geographically fixed, context' resulting in deterritorialization (Jennings 2011:125). The concept was initially introduced by Deleuze and Guattari (1979) where borders are imposed to classify groups and populations. Deterritorialization occurs as a result of increasing interaction between groups of people from distant regions. The 'local becomes global' and supports a 'proliferation of translocal cultural experiences' (Hernández 2002). Several scholars contest this idea with Brenner (1999) arguing that territoriality is reconfigured or rescaled rather than uniformly eroded, and permeability is highly differentiated (see Section 9.3.4). Furthermore, Cox (2004) highlights that because sovereignty is an ideal it cannot be completely eroded—but it can be superseded.

The most obvious example of deterritorialization in the Indian Ocean during the first millennium CE, aside from the transnational nature of the ocean itself, includes the presence of entrepôts. These early entrepôts can be compared to modern hyperspaces such as airports (Kearney 1991, 2004) and are symptomatic of long-distance exchange, acting as transshipment locales for commercial goods. It is anticipated that the physical limits of island spaces could inhibit the process of deterritorialization; however, this was not the case in the Indian Ocean or the Maldives where the island of Male' acted as an entrepôt for both the archipelago and the wider Indian Ocean, especially during the Islamic period (Colton 1995).

A further example of deterritorialization in the Indian Ocean that occurred during the early phase of Maldivian occupation is strikingly exemplified by the expansion of Buddhism throughout a large region ranging from West to East Asia. But is also witnessed in ceramic assemblages—in the South Asian wares that were recovered at all archaeological sites detailed in Chapter Six. Earthenware *handis* were not only acquired from the mainland but they were utilized in the same fashion as they were on the continent. Likewise, as detailed in Chapter Seven, Buddhist reliquaries and votive stupas were also used in the Maldives as they were in Sri Lanka and in India, although these objects were made locally. Furthermore, carved lion sculptures were found at early occupation sites (see Chapter Eight), which represent exotic animals, highlighting the absorption of cultural traditions across geographical boundaries.

Another example of deterritorialization occurred during the second peak in interaction, after the seventh century CE when Islam was distributed from Arabia through to East Africa, India and Southeast Asia. The material correlates of this can be seen in the coral-stone mosques in the Maldives, which are stylistically similar to those found along the East African coastline, as outlined in Chapter Four.

These cultural expansions alongside the presence of *entrepôts* and the material culture evidence, suggests that the ill-defined cultural boundaries indicative of deterritorialization were present during the two peaks of interaction identified in this thesis.

9.3.3 Hallmark Three: Standardization

Standardization is a feature of a global culture and primarily serves the function of translation, enabling exchange to occur from one society to another. A good example of this is a *lingua franca* or a common currency. In anthropological literature, standardization of material culture represents specialized craft production, which is often considered a key variable of a complex society (Longacre 1999).

Standardization typically results in a high degree of similarity in attributes, although is not synonymous with uniformity. Uniformity in the archaeological record can be defined as objects or practices that will resemble each other in both appearance and behaviour (Brunsson and Jacobsson 2002). Standardization and uniformity are often treated as synonymous, whilst standardization causes uniformity, so do other processes such as diffusion, innovation and imitation. The manner in which uniformity is achieved through standardization is contingent on several factors: the information available, presence of standards, the number of actors, the relevance (identity and situation of the actor), interpretation, implementation and importantly a lack of competition (Brunsson and Jacobsson 2002).

Many standardized material culture items and practices can be found in the first millennium Indian Ocean, but of particular relevance is the export of *Monetaria moneta*, which was used as a currency across regions, although with slight inflections in the way its value was conceived. Evidence for the earliest use of cowry shell money can be seen in the archaeological record of China, with dates ranging from the second

millennium BCE. Chapter One outlined the historical record relevant to the trade in cowries, which was the first medium of exchange in the Maldives. It was traded to India, where the shells were exchanged for rice and cloth. Some cowry shells were not resold but remained in India, and used as a 'hard currency' for ferry-tax across river crossings. A similar use was documented in Thailand (Yang 2011). The Maldivian money cowry was dispersed from the major markets in Bengal into West Africa by Arab traders, where the gastropod was not local (Scales 2015). The Portuguese began to purchase cowries in Sri Lanka and India, which they then used as ballast and sold into the West African networks.

As outlined in Chapter One, the faltering of the cowry money industry was the result of the introduction of a competing shell currency that resulted in collapse. In the case of *Monetaria moneta*, this was the golden ringer or ring cowry—*Monetaria annulus*. This resulted in hyperinflation and the collapse of the industry, with some shells crushed and used as lime and others stored as hoards (Scales 2015). As previously outlined, an estimated 30 billion Maldivian cowry shells were fed into international markets before the collapse of the industry, but an example of the mentioned inflation can be seen in changing price of slaves. In 1680, European slave traders exchanged 10,000 shells for one slave; however, by the 1770s 150,000 cowries could be exchanged for one slave (Scales 2015).

9.3.4 *Hallmark Four: Unevenness*

The relative distribution of power is central to an understanding of globalization, which can also be described as 'a means through which new manifestations of power are exercised' (Kay 2004). Globalization as a phenomenon includes interdependent forces that act 'unevenly across space and time ... this unevenness is critical to our understanding of who are the winners and losers in a globalising world' (Kay 2004). One way to discern 'power' in the archaeological record has been to identify evidence for a transfer of surplus, although many other aspects of power are considered within interaction studies, such as political and ideological dominance. Moreover, studies of power relations in world systems (and in other models) gravitate towards transdisciplinary approaches, as they require an examination of complicated relationships: economic, political and religious in addition to develop an understanding technological innovations, climatic change and demographic trends.

The power geometry present during the first millennium CE has been plotted throughout the Indian Ocean through the lens of world systems analysis, with the major proponent being Phillipe Beaujard (2005, 2007, 2011, 2012). Beaujard posits the emergence of an African and Eurasian World-System. He defines this as 'the articulation of the Indian Ocean with the China Sea and the Mediterranean, and the interconnections between maritime and terrestrial routes' (Beaujard 2007). His model is descriptive and includes between three to four cores: China, India, West Asia and Egypt with inequalities emerging from demographic and geographic factors in addition to mechanisms of production and exchange. Additionally, four economic cycles defined the expansion of the system.

It is notable that the Maldives—and several other Indian Ocean islands—remain entirely absent from all Indian Ocean world systems discussions (e.g., Beaujard 2005, Beaujard 2005, Beaujard 2011, Beaujard 2012). The Maldives would never have been conceived as a 'core' within descriptive models of the Eurasian and African world systems and would likely be considered a semi-periphery, articulated similarly to the Swahili coast. Evidence of surplus and specialized trade goods during the early period is marked by the extensive processing of cowry shell. The distribution of the cowry industry was also managed by the Divehi, which would not have been the case if the Maldives were considered a periphery. The cowry eventually became a medium through which to control the periphery, as it was sold to core areas like India and later to Europeans to be filtered into the periphery of West Africa to purchase slaves. People on the periphery tend to not benefit from the process of globalization, especially if they have little trade potential. This provides one major explanation as to why the Maldives became a part of the globalized Indian Ocean, whereas other islands such as Chagos and the Seychelles did not until European forces later entered the Indian Ocean.

Semi-peripheries also act as 'pivots' or nodal entities between distant locations and cores. At the turn of the first millennium CE the Maldives intersected a major maritime trade route, in addition to being centrally located between the cores of West Asia and China. Fitzpatrick and Callaghan (2008) highlight the probability of an intersection with the Maldives in movements across the Indian Ocean. Many historical documents

written by travellers confirm this usage, by referring to the islands as places to restock and resupply during long distance voyages across the Indian Ocean (see Chapter Four).

Furthermore, unevenness is demonstrated, in that the Maldives did not have a significant cultural impact outside the archipelago while, aspects of South Asian and West Asian cultures became embedded in the Maldives. This can be seen in the adoption of particular ideologies and cultural practices discussed in Chapters Four–Eight, such as in the conversion to Islam in 1153 CE. Additionally, the Maldives were dependent upon trade with exterior regions owing to environmental limitations—as power is defined by the control of resources (social, political or economic), environmental constraints inevitably played a role in power structures in the region (Beaujard 2005).

9.3.5 Hallmark Five: Cultural homogenization

Discussions of globalization incorporate cultural homogenization, which represents the fifth hallmark of a global culture and is often referred to as 'McDonaldization' (Ritzer 1993, 2002). Cultural homogenization does not represent total cultural uniformity although it does illustrate how people 'come into contact with widely shared ideas and make them their own' (Jennings 2011).

In the Indian Ocean an example of cultural homogenization is the process of 'Southernization' (Shaffer 1994). This refers to a variable process beginning in Southern Asia, spreading around the globe and analogous to contemporary 'Westernization'. It incorporated the development of mathematics, the production and selling of spices, new trade routes, dispersal of ideology, cultivation and processing, the marketing of crops and related technologies. Southernization was under way in South Asia in the fifth century CE, during the reign of the Gupta's (320–535CE) and spread into China. By the 8th century CE its influence had spread into the Gulf of Arabia. However, Westernization soon succeeded with the British takeover of Bengal.

The most obvious examples of homogenization in the Maldives, can be linked to 'deterritorialization' during the presence and adoption of religious ideologies during interaction peaks. Buddhism was present in the Maldives from at least the third century CE and it appears to have been practiced similarly to the mainland. On current

evidence the first occupants were adherents to this religion. The later dispersal of Islam represents another episode of homogenization, also occurring in the adjacent Indian area beforehand from the seventh century CE. A final example is the Maldivian use of ceramic *handis*, which were used in cooking, mirroring the use on the South Asian mainland, suggesting uniformity in the region.

9.3.6 *Hallmark Six: Cultural heterogeneity*

The sixth indicator of a global culture seemingly contrasts with the above position by suggesting that a degree of variation will also be present i.e. a 'mélange' of elements (Jennings 2011). Appadurai (1996) emphasizes this facet of globalization by arguing that globalizing and localizing processes reinforce each other and are not exclusive. The heterogeneity perspective proposes the continuous reinvention of local cultures as recipients of global forces (Appadurai 1996). Beaujard (2005) refers to this mélange as typical of syncretic 'fringe cultures'.

Heterogeneity is especially apparent in the archaeological record of the Maldives across a variety of material culture classes, particularly in the ceramics assemblages. The bead assemblage at Vadhoo, which likely coincided with the Buddhist period, for instance, highlights this trend with a carnelian bead from India found in association with a lead glass gourd shaped object of East Asian provenance. The archaeological assemblages were dominated by South Asian earthenwares, but in the more recent phases included a range of Far Eastern tradewares, alongside Western Asian pieces (see Chapter Six). The frequency and diversity of East and West Asian ceramics clearly increased during the second peak of interaction which occurred during the Islamic period.

Sahlins extended the discussion of heterogeneity with the concept of the 'Indigenization of modernity' i.e. making McDonald's burgers relevant to non-US cultures. Buddhist reliquaries recovered from Maldivian sites involved the use of cowry shell in place of normative materials, such as semi-precious stones and precious metals in Sri Lanka and India. This provides some indication as to the local value of the shell within a Maldivian context. This has also been seen in Shang period China, where cowries were manufactured into bronze skeumorphs (*tongbei*). Furthermore, several carved stone marine animals were found associated with Buddhist sites in the

Maldives (previously located at the National Museum in Male'), which indicates a modification of expected Buddhist symbols to reflect the new island context.

9.3.7 Hallmark Seven: Re-embedding of local culture

Re-embedding of local culture is closely related to cultural heterogeneity. It occurs as a reaction to the 'centripetal tendencies of globalization' when people resist globalizing processes, as increasing interaction 'throws one's life into sharper relief' (Jennings 2011:4). The result is a strengthening or persistence of local and domestic traditions that can be difficult to discern archaeologically.

However, the historical and ethnographic record of the Maldives documents a prominent example, in the long-standing practice of the local *Fanditha* magic. *Fanditha* magic is typically employed for positive purposes, for example a father may write a *Thavid* or prayer on paper (originally palm leaf) which he then fastens to his child's arm or waist (Colton 1995). Pyrard de Laval (1887:176) also recorded *Fanditha* in the seventeenth century, watching Divehi present offerings to the 'King of the Winds':

Those who have escaped from danger come to make offering daily of little boats and ships fashioned on purpose, and filled with perfumes, gums, flowers and odiferous woods. The perfumes are set on fire. The little boats cast upon the sea, and they float until they are burned...this they say is so the King of the Winds may accept them.

The time-depth of this practice appears to predate the introduction of Islam, but does not appear linked to other places or cultures. The continued reinforcement of *Fanditha*, especially alongside the major World Religions that were introduced to the archipelago, indicates the re-embedding of local culture. Another local subsistence behaviour involves a clear preference for tuna fishing, which is evident in the archaeological record (see Chapter Seven). The dominance of tuna in all periods, despite the availability of inshore reef fish highlights a deliberate and continued practice perhaps linked to the presence of ocean-going boats or cultural preference for tuna. An emphasis on tuna fishing is present today and the traditional Maldivian method of fishing by pole-and-line sinking is still used to support sustainable fishing practices.

9.3.8 *Hallmark Eight: Vulnerability*

Societal vulnerability is a marker of globalization and it is thought to increase as a consequence of increasingly dependent relationships on foreign areas. This is evident in the Maldives, which were, and are still, exceptionally reliant on trade. It must be noted that small islands are vulnerable environments, owing to small population size, limited natural resources and often specialized economies involving a small number of resources/goods (Lockhard *et al.* 1993; Conway 1998; Slade 1999). The vulnerability of the Maldives during the early occupation phase can be seen in the conversion to Islam in the twelfth century. Historical records suggest that this involved the rapid collapse of the Buddhist tradition throughout the islands, and the conversion of the local population by a small number of non-locals. The Buddhist *havitha* structures were intentionally buried during this phase, the evidence for which has been described in Chapter Five.

Another indicator of vulnerability is evident in the collapse of the cowry shell industry. Chapter One outlined that this occurred in the late nineteenth century. Maldivians had to rely on alternative natural resources as a source of wealth, which was problematic owing to the limitations of the atoll environment. Whilst this period is outside of the scope of this research, it underlines Maldivian dependency on foreign economies. For example, today cultural tourism has overtaken as the main industry upon which the population is reliant. The economy has again become vulnerable with a recent spate of extremist attacks on cultural institutions in the Maldives and ongoing political turmoil, which has destabilized the cultural tourism industry.

9.4 Summary

In summary, two phases of increasing interaction in the Maldives were identified during the first millennium CE, during which global cultures were present. Time-space compression was evident in the early Buddhist phase in terms of knowledge of the monsoon and also the use of the lashed-lug technique of ship manufacture within mainly lateen sailed ships. A second technological innovation occurred with the development of navigational tools such as the astrolabe and quadrant during the Portuguese expansion. Deterritorialization was also evident throughout the wider Indian Ocean with the proliferation of the trading entrepôt or trading locale. These transnational spaces supported and promoted interaction between people from distant

regions, one of which was located centrally in the Maldivian archipelago on the island of Male'. Other evidence included the use of ceramics such as *handi*, and also the arrival of Buddhism and Islam. Standardization can also be seen in the region from the use of a common currency—the cowry shell, which was exported from the Maldives in incredible quantities and used in West Africa and Bengal until competition resulted in the collapse of the industry. Prior to collapse, the Maldivians controlled the trade of this major commodity. Cultural homogenization can be seen in the Maldives in the incorporation of Buddhism and Islam into local practice. Cultural heterogeneity is also apparent in the archaeological record and was particularly associated with the Islamic period. This involved a diversity of imported materials from the Eastern, Western and Southern Indian Ocean regions recovered from archaeological sites in the Maldives. There is little archaeological evidence indicating a resistance to globalization, however the documentation of *fanditha* magic provides one example, in addition to the long-standing preference for tuna fishing. The final hallmark discussed—vulnerability—is best illustrated by the collapse of the Buddhism in the Maldives during the twelfth century, when Islam expanded throughout the Indian Ocean.

10

Conclusions and Future Directions

10.1 Introduction

This chapter presents thesis outcomes in relation to the research aims given in Chapter One. As previously outlined, there are many contemporary examples which highlight the use of islands in historically significant expansions; however, despite these identified geo-political and economic functions, the impact of past globalizations on remote islands has not been studied from an archaeological perspective. To address this, several aims guided the study. The first was concerned with the early Maldivian occupation phase, the second raised the question of how globalization might be reflected in remote island colonization and the third examined how globalization shaped ethnogenesis in remote islands, specifically, how did an emerging and distinct Maldivian identity develop from surging interactions and international expansions?

10.2 Where did Maldivian colonization occur from and when?

Early models of Maldivian colonization and occupation are largely based on observations drawn from studies of material culture, historical linguistics and ethnography. Previous chapters established a revised occupation chronology and made new analyses of material culture from excavated and surveyed sites in the Maldives. These results are discussed in relation to the major research themes identified in Chapter Four that include: initial colonization, the arrival and impact of Buddhism and Islam in the archipelago, trade and exchange patterns, subsistence strategies and the export of cowry shell in order to propose a model of early human occupation.

10.2.1 Initial Colonization

Maldivian colonization has been inferred from linguistics and textual sources, with recent insights based on genetic research on the modern human population. All disciplinary evidence points to a South Asian connection/origin, with genetic data supporting multiple colonization events from South Asia. This is a reasonable proposition considering the close proximity to the continental region, which also, as documented in Chapter Three, witnessed large volumes of maritime traffic. The date at which Divehi diverged from a Prakrit language is more contentious, although historical linguistics highlight an Indo-Aryan origin. Nonetheless, the antiquity of human arrival in the Maldives is still a source of speculation, largely owing to the small number of sites and questionable reliability of radiocarbon dates from early investigations.

In Chapter Five, major issues with the existing radiocarbon corpus were discussed, especially a reliance on determinations made on unidentified charcoal specimens and marine shell dates which have not been calibrated with a regional correction value. My research resulted in a new chronology that incorporated ^{14}C dates on short-lived wood species (carbonized *Cocos nucifera* nut shell) and an explicit shell calibration that used a ΔR of 138 +/- 64 yrs (Southon *et al.* 2002). The earliest reliable age was obtained from Nilandhoo Foamathi in the lowest excavated layer from Trench 4 (XU11), dating to 249–393cal CE (95.4%) (Wk-30394). This represents the oldest record of human occupation in the Maldives, therefore providing a new *terminus post quem* for human colonization of the islands.

The early ^{14}C result from a central site—Nilandhoo Foamathi—was older than results obtained from the north-central site of Kuruhinna Tharaagadu. The islands formed earlier than the dates obtained (e.g., Kench *et al.* 2009), so colonization may well have occurred earlier (as outlined in Chapter Four). It is also likely that the northern atolls closest to the continental region were colonized first. This proposition needs to be tested archaeologically and emphasizes the need for further excavations and better radiocarbon dating of sites in the Maldives. This is especially the case for the northern atolls above the Maldives in the Lakshadweep (or the southern atolls of the Maldives) where no detailed archaeological work has been conducted. Further,

palaeoenvironmental data would be useful in refining the timing of human arrival (Kirch and Ellison 1994; Stevenson *et al.* 2001; Anderson 2002).

10.2.2 Major World Religions in the archipelago

The dispersal of major world religions throughout the Indian Ocean and the Maldives was discussed in both Chapters Three and Four. However, this research contributes further insight through new ¹⁴C dates and analysis of material culture. The refined radiocarbon chronology not only provides the oldest reliable date yet obtained from the Maldives, but it also relates to the early presence of Buddhism in the archipelago.

Radiocarbon dates for Buddhism in the Maldives are expected to occur later than those for Buddhism in adjacent continental regions. For example, the birthplace of Buddha at Lumbini in Nepal is dated to the 6th century BCE (Coningham *et al.* 2013); however, the earliest dispersal of brick and stone structures throughout the South Asian region is usually attributed to the later period of Emperor Asoka (274–232 BC) (Coningham *et al.* 2013). It has been stipulated in textual sources that the expansion of Buddhism to the Maldives occurred during the period of Asoka; however, no dated Buddhist sites in the islands yet correlate to this period.

This research documented four Buddhist sites where ritual aspects have been discerned, including the use of stupas, and reliquaries within stupas in addition to the presence of baths and the use of tortoise bone on a platform at Kuruhinna Tharaagadu (Mikkelsen 2000). These practices all conform to known Buddhist traditions on the mainland. Furthermore, caches of money cowry at Buddhist period sites potentially represent an offering to the monastery, which agrees with the widespread South Asian practice of donation (Fogelin 2006). Interestingly, many of the early Maldivian coral-stone carvings depict ‘crude’ Buddhist symbols and images, when compared to those on the mainland suggesting that they have been manufactured by novice-carvers or the islanders were not attempting to replicate the intricate architecture present on the mainland during the start of the cowry extraction phase. The presence of simple dome votive stupa shapes at all sites indicates limited investment in carving during the early period (see Chapter Eight). This contrasts with the intricate coral-stone carvings present in the Maldives subsequent to the arrival of Islam, which is evidence for greater artisanal investment in religious carving.

No Islamic sites have been radiocarbon dated (i.e. mosques), nor were they investigated in this research. However, the date when Buddhist *havitha* sites were intentionally covered is a marker of Islamization at particular locales. Radiocarbon dating of the fill of Feature 1 at Nilandhoo Foamathi returned a date of 1170–1423 cal CE (95.4%) (T-5575). This is slightly later than the date provided by the epigraphic Isdhoo Loamafanu (1153 CE), indicating that the transition from Buddhism to Islam may not have been synchronous across all parts of the Maldives, this is confirmed in historical sources.

Although Hinduism is often cited as an early religion in the Maldives there is no conclusive evidence for it in the form of religious scripts or *linga* statues (Romero-Frías 1999; Gippert 2015). The absence of Hinduism noted by other researchers is supported by the lack of Hindu artefacts at all sites investigated in this research.

10.2.3 Trade and exchange

Previous studies on Maldivian trade have relied heavily on textual sources particularly those related to the export of cowry shell and coir rope. Much of the material culture analyzed from the excavated and surveyed sites was traded into the Maldives and the provenance of this imported material provided new insight into trade between the Maldives and surrounding areas.

The most conspicuous is the ubiquitous presence of Indian earthenwares (i.e. PIW) at all sites in both Buddhist and Islamic period contexts. Many of the vessels showed evidence of sooting and were cooking pots (*handis*). There were also a large number of storage jars. The volume of these earthenwares at Maldivian archaeological sites indicates that these vessels were frequently used and replaced suggesting that they were a regular trade item. Other materials present at Maldivian sites were also manufactured in India, such as beads, glass, metals and stone artefacts. All finewares or higher status ceramics were present in smaller quantities and most were manufactured in regions further afield such as China and Western Asia.

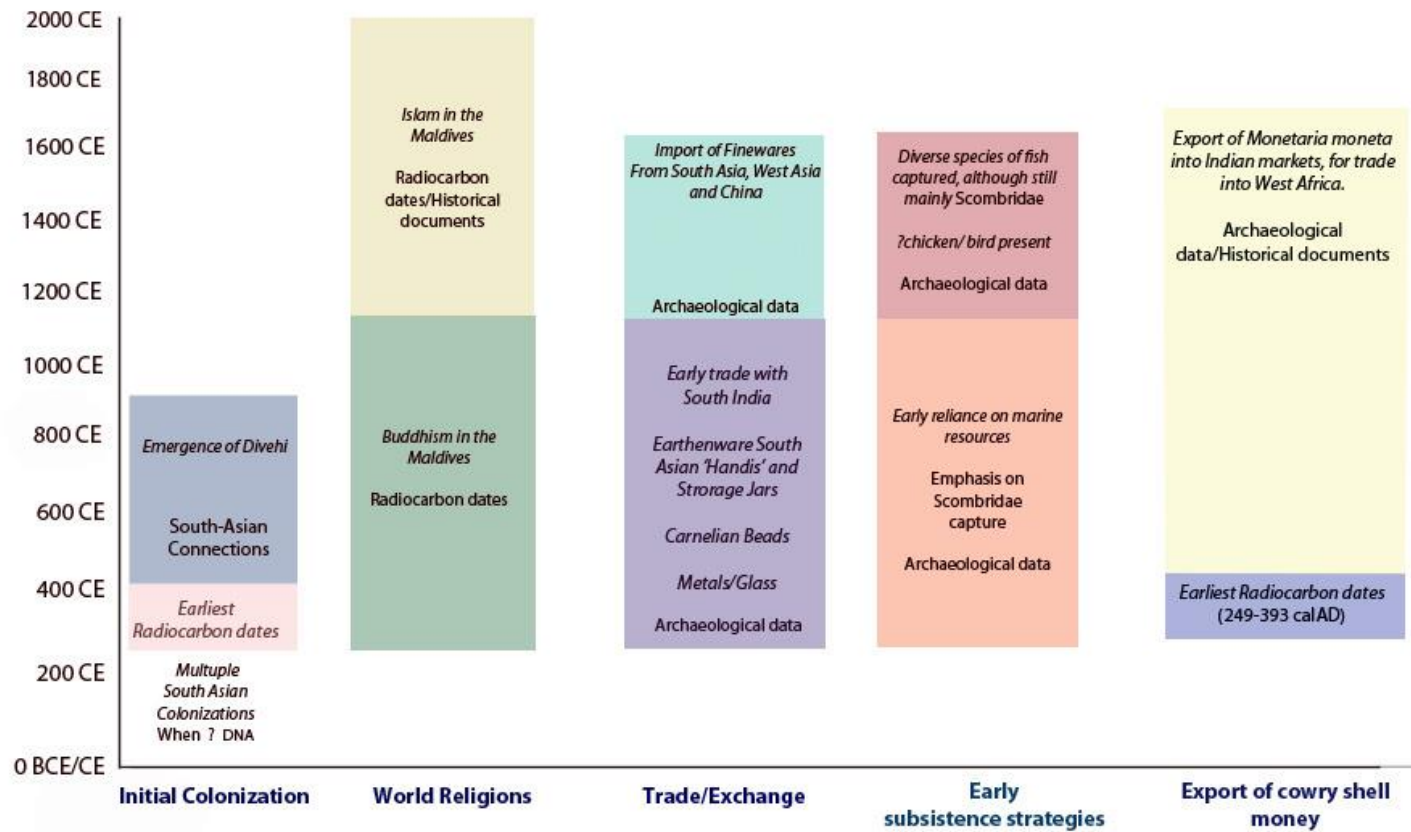


Figure 10.1 Summary Diagram: The Early Human Occupation of the Maldives
 Credit: Mirani Litster

Such evidence of trade and exchange provides us with information about the source of material culture but does not necessarily identify which groups were responsible for trade nor the process (e.g. direct importation or the collection of cargo from entrepôts). The large volumes of South Indian PIW at archaeological sites supports a major South Indian export locality, which agrees with the historical record where cowry shell exchange into the Southern Indian markets is documented. This data also supports longstanding trade with India with the inclusion of high-status objects from East Asia and West Asia forming a small proportion of the ceramic assemblage. These high-status ceramics may have been imported as a product of direct or down-the-line trade, although the historical record suggests that Maldivians were not partial to foreign traders in the atolls and preferred to travel to India and select the items required (Romero-Frías 1999).

Travelogues also document the presence of Arab traders in the Maldives in the post-Buddhist era. The recovery of *Rattus rattus* remains at archaeological sites in the region has been linked to the presence of Arab traders, who were thought to be the primary movers of the commensal. Rat bone (likely *Rattus rattus*) was recovered from Maldivian archaeological sites mainly in the post-Islamic period, providing a very tentative archaeological link to their contact with the archipelago.

10.2.4 Subsistence strategies

The faunal remains analyzed in Chapter Seven provide insight into early subsistence strategies that have previously only been identified from ethnographic and historical sources. Faunal data indicates a reliance on fishing, with only small quantities of other vertebrate fauna. The major fish taxon represented in the analysis belonged to the Scombridae family, which was associated with both the Buddhist and Islamic periods and agrees with ethnographic data, suggesting a continued practice related to a preference for tuna and/or bonito. In the Islamic period a more diverse range of fish were taken, including species from the reef area particularly Scaridae, Lethrinidae and Lutjanidae. Evidence for the processing and consumption of fish was also recovered from Nilandhoo Foamathi. Minimal quantities of bird bone were found, with one likely chicken bone recovered from the recent Islamic period at Nilandhoo Foamathi.

Unusually, for a remote island group there was no evidence for the consumption of marine molluscs at any of the investigated sites with the majority of shells from archaeological deposits from *Monetaria moneta* used for commercial and religious transactions. Shell middens have been recorded in the Maldives and it would be of benefit to study these sites further to gain insight into the consumption of molluscs. Evidence for other types of foraging or hunting is similarly limited. Furthermore, a lack of archaeobotanical studies in the region inhibits our understanding of early agriculture in the Maldives, with unsubstantiated inferences drawn from the ethnographic record, such as the model of early taro consumption proposed by Munch-Petersen (1982) and discussed in Chapter Four. Problems in using historical references to infer the presence and type of early agriculture in the Maldives were highlighted in Chapter Four, and new archaeobotanical research is needed to resolve this issue.

10.2.5 Export of cowry shell money

Finds of *Monetaria moneta* outside of the Maldives date from the second millennium BCE in North China and to younger periods in mainland Southeast Asia, West Africa and India (Ray 2003). However, not all of these shells have necessarily derived from the Maldives, especially those recovered in China, which may well have been sourced from adjacent areas where the species also exist.

Mikkelsen's (2000) model of Maldivian occupation posits that the islands were initially colonized to facilitate the Buddhist exploitation of cowry shell. This proposition is very reasonable owing to the inhospitable nature of the islands, especially when compared to adjacent regions (i.e. Sri Lanka and India) and also, as can be seen in Fig. 10.1, on current evidence the export of cowry was coincident with the early colonization period. The Buddhist sites examined in this research contain substantial deposits of cowry shell money, supporting an association between Buddhist occupants and shell money. Also, the intentional marking of a cowry shell in the earliest cultural layer at Nilandhoo Foamathi suggests that the cowry shell was of significance to early Maldivians, as this can be considered a decorative or ritual action. The Islamicization which occurred later, may have been a passive outcome of increased trade in the region, or it might have been directly related to control the cowry resource in the island chain, a subject that requires further investigation.

The direct and indirect dating of cowry shell deposits in this research is especially significant in that it provides a new *terminus post quem* for the processing of cowry shell money in the Maldives. The earliest historical records for shell money export occur during the ninth century and were composed by Arab traders—the archaeological evidence presented in Chapters Five and Seven predates this period substantially. Context dates for cowry shell money deposits are older than direct shell ages, and were obtained from Nilandhoo Foamathi (XU 10, Feature 4). These shell deposits were located between layers dated to 249–393 cal CE and 552–647 cal CE. These results confirm that Maldivians were processing and exporting cowry shell from the early Buddhist period and were likely exporting cowry into India initially for local distribution. The African archaeological record supports a later distribution of Maldivian cowry from India into Africa, where it was prized in lieu of the local ring cowry when it became known as ‘small Maldives’. It is also possible that Maldivian cowry was exported to China in an intermediate phase of shell money use in East Asia, with a more local initial source.

10.2.6 Summary

As shown in Figure 10.1 radiocarbon dates indicate that the Maldives have been occupied from at least the third century CE, although it is reasonable to assume, given the relatively small amount of archaeological and palaeoenvironmental work, that older sites exist. The earliest dates also coincide with the first evidence for Buddhism in the archipelago and the archaeological record highlights that Maldivian Buddhism was heavily influenced by Sri Lankan and Indian practice. Islam was introduced in the twelfth century CE although the radiocarbon dates from Nilandhoo Foamathi support the historical record in that they indicate that this process did not occur synchronously throughout the archipelago. Early subsistence strategies included a reliance on fishing, with the archaeological record reinforcing the ethnographic record and finally, it is proposed here that shell money was exported from the Maldives prior to the period documented in the historical record (i.e. the ninth century), with evidence of processing and local circulation dating from between 249–393 cal CE and 552–647 cal CE, where it has been found in Buddhist site contexts.

10.3 How does remote island use reflect globalization?

What motivates island colonization is often difficult to discern and is especially difficult to understand in prehistory (Anderson 2006). Remote islands are inherently difficult environments to negotiate as they are distant from major landmasses and can be devoid of many natural resources found in continental settings. Human populations colonizing islands confront considerable challenges, including new and often threatening environments, requiring niche shifts—the founding population have to survive a ‘stochastic risk of extinction’ to survive (Keegan and Diamond 1987). The natural boundaries presented by islands have also resulted in the study of islands as cultural and biological laboratories (MacArthur and Wilson 1967; Terrell 1977; Keegan and Diamond 1987). Keegan and Diamond (1987) suggest that:

If nothing were known about the actual history of island colonization by people, it might logically be assumed to have preceded as follows:

- 1. Close islands were colonized before distant islands;*
- 2. Big islands were colonized before small islands;*
- 3. Islands were colonized by peoples closest to them, or at least by the peoples with easiest access, taking winds and currents into account; and,*
- 4. Technologically more advanced peoples reached islands earlier, or reached more distant islands, than technologically less advanced peoples.*

This hypothetical model can be challenged as the historical occupation of many islands does not follow the logical sequence proposed. For example, Samoa in the Pacific was settled around 1,500 years prior to the much larger and less-remote island of Madagascar in the Indian Ocean (Dahl 1951). As Keegan and Diamond (1987) point out, why were Hawaii and Easter Island settled by people with origins in distant Southeast Asia, and not the Americas to which they are closer? The known human history of island settlement has long put pay to deductive ‘too-neat’ models that focus only on physical variables, suggesting it is necessary to also look at alternatives, such as the cultural processes that might impel large population movements, particularly those involved in globalization.

Despite studies such as Guebourg's (2006) *Petit iles et archipels de l'Ocean Indien*, remote island colonization and history is understudied in Indian Ocean research. The number of islands or island groups identified in the Indian Ocean exceeds 64, with many of these considered 'remote' and dependent territories. This is particularly so in the Western Indian Ocean, where the legacy of the seventeenth century French expansion remains in Mayotte, Kerguelen Islands, Bassas da India, Europa Island, Glorioso Islands, Juan de Novo, Réunion and Banc du Geysier, among others.

The Maldives are currently a Republic although historically they have not been divorced from the effects of imperialism. As described in Chapter Four, there was a brief period of Portuguese rule during the sixteenth century. The Dutch supplanted the Portuguese in Ceylon (Sri Lanka) in the mid-seventeenth century and consequently gained control over the adjacent Maldivian archipelago. The British soon took power in Ceylon, also resulting in the control in the Maldives; however, internal administration of the Maldivian islands was regulated by Islamic state law.

As seen in Chapter Nine, a surge of interaction in the Indian Ocean coincided with the early phase of Maldivian occupation and the presence of a global culture in the archipelago. This was detailed in Chapter Nine but is most apparent through the presence of Buddhism. A subsequent phase of surging interaction occurred during the Islamic period, which involved Arab trade expansion, but also coincided with the Transatlantic Slave Trade from the fifteenth century onwards. The colonization of the islands established in Section 10.2, highlights that on current evidence the Maldives were one of the first island groups to be occupied in the Indian Ocean with an initial source population from South Asia and were occupied by Buddhists to exploit the supplies of *Monetaria moneta*—a valuable commodity. It was also discussed in Chapter Nine, that the dearth of valuable resources among other island groups (such as Chagos, the Seychelles and Réunion) explains their later occupation.

In summary, it is argued here that remote islands are often occupied for specific purposes during large expansion events. It has also been identified that the archaeological signature for past globalizations will differ between island and

continental environments—there will be no initial ‘build up’ phase in island contexts, which is illustrated in the schematic in Chapter Nine (see Fig. 9.1). This model differs from what would be anticipated in continental contexts (see Fig. 2.3).

10.4 How does globalization impact ethnogenesis in remote island communities?

Ethnogenesis concerns ‘the processes, transformations, causes and politics of social identity making’ (Weik 2014:292). Ethnic identity has been defined by Weber (1978:389) as a ‘belief in group affinity that is based on subjective beliefs or shared common ancestry drawn from similarities of physical type or of customs of both ... or of memories of colonization and migration’, with the genesis being a process of ‘ethnomorphosis’. The colonization of islands is a phenomenon which results in populations adapting to new environmental conditions under which preconditioned social behaviours and patterns are no longer relevant. Thus resulting in the formation of new identities (Voss 2008). The previous chapter established interaction surges and the presence of global cultures in addition to defining several features concerning ethnic identity as they relate to globalization.

It is apparent that Maldivian identity is very much tied to the local environment, for example the term *Divehi* means ‘islander’ and the Fanditha custom associated with the ‘King of the Winds’ exemplifies this. The significance of resources such as coconut palms and tuna fishing is clear. If cultural transmission were thought to occur through phylogenetic processes it would be anticipated that the majority of customs and ethnic ties could be traced to India and Sri Lanka. However, if transmission occurred horizontally, that is via reticulate processes, influences and customs from interactions with East Africa, Arabia, India, Sri Lanka and Southeast Asia would be equally present. Neither of these scenarios explain Maldivian ethnogenesis.

The global cultures model outlined several aspects of *Divehi* identity. For example, most customs are associated with the adjacent mainland, which includes the adoption of particular cooking vessels (*handi*), and also the widespread dispersal of Buddhism and its associated objects of material culture, such as reliquaries, stupas (*havithas*) and stone-carvings. However, other customs are associated with Arabia (Islamicization in the twelfth century, modification of language), East Africa (carved stone mosques)

and East Asia—the lacquer designs on handicrafts in the atolls is thought to be inspired by Chinese porcelain designs (Munch-Petersen 1982).

Therefore, neither reticulate nor phylogenetic models fully explain the development of Maldivian culture. It is argued here that the process of globalization can account for these transformations, through the exposure to a wide variety of influences, which directed Maldivian practices away from a singularly South Asian manner of custom. Distinctly Maldivian customs were also formed during the early colonization phase, with most of these apparently related to the island environment. Moreover, the circumscribed environment resulted in rapid cultural uptake, such as the conversion to Islam during the twelfth century, which was modified from international contexts to suit the Maldivian archipelago.

10.5 Implications of the study and future directions

Previously, the Maldives have been sidelined in discussions of both Indian Ocean world systems and globalization, which is a conspicuous absence owing to the large scale export of one of the first global-commodities—cowry shell money. This study has explored the Maldivian involvement in a larger system and also suggests that remote island occupancy will often be motivated by resource extraction. As outlined in Chapter One, cowry shell money has been used in a variety of contexts and its use has a considerable time-depth. Because the occupation history of the Maldives is more recent than early cowry shell money use in China, Maldivian cowries may have become integrated into pre-existing monetary systems. Here it is suggested, in agreement with Mikkelsen (2000), that Buddhist practitioners, who had already expanded to the higher latitude regions of China, settled the islands in order to exploit the cowry for use in its intermediate phase of distribution.

This hypothesis also highlights why other remote islands in the Indian Ocean were not occupied until recently—as they offered very little to Indian Ocean trading communities. The settlement of remote islands during expansions in prehistory also supports the idea that empires and other complex social formations expand through remote nodes, and use these for diverse reasons such as penal colonies, strategic outposts or to acquire materials not available in local contexts; extraversion is a

consistent behaviour of empires. This can be seen in the Mediterranean, with the Phoenician settlement of Malta during the first millennium BCE, which was colonized for strategic purposes (Toynbee 1973).

The link between remote island occupation and the expansion of complex societies would benefit from the study of other remote islands in the Indian Ocean. Firstly, the archaeological sample needs to be increased to better explore this relationship, and also to examine early surges of interaction. The research here presented a refined chronology for Maldivian occupation, although higher resolution dating regimes need to be put into practice. Moreover, sites in the northern and southern atolls need to be included in the discussion to start filling archaeological gaps related to Maldivian colonization. The model adopted here is qualitative and engages a flexible approach to a very variable set of conditions and it would also be beneficial to study the impacts of globalization during the same expansion events on the mainland—India—to better establish the effects of insularity on globalization processes.

In conclusion, this thesis finds that the Maldives were settled because of the abundance of natural resources—*Monetaria moneta*. The established tradition of shell money use in East Asian contexts likely provided impetus for Indian Ocean communities to extract the resource elsewhere, which may have been a primary driver for the colonization of the Maldives by a Buddhist founding population. During the two millennia after colonization, the isolated environmental conditions acting in concert with the forces of globalization resulted in a unique Maldivian society in the Indian Ocean.

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