Climate change, sea-shore erosion and the disappearance of cultural sites: Putting the record of archaeological remains in Islanders’ hands

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Abstract

Climate change and the progressive rise of the average global sea level or mean sea level (MSL) are threatening at a fast pace many cultural sites on the coasts of the Pacific Islands. Archaeological sites are especially vulnerable, many of which may be unknown to present-day inhabitants and characterized by sparse physical remains like potsherds, stone and shell tools, small ornaments or human burials. Most Pacific Islands States don’t have the capacity to finance field-teams to record this vanishing heritage. In this paper I will provide a number of examples which illustrate the urgency of the threat in Oceania, and I will present a simple tool-kit designed to allow Islander communities to record their own archaeological remains. The main objective of this kit is to empower local communities to record and manage their archaeological heritage, allowing them to safeguard for future generations the objects of the past found eroding from their beaches. From experience, this appears to be the only realistic way to properly address the issue of climate change and its impact on the archaeological heritage of Oceania, in a region that lacks national capacity in cultural heritage preservation.

Key words: Oceania; cultural heritage; climate change; archaeological remains; community empowerment.

Introduction

In Pacific Islander cultures there is a strong binding between the tangible heritage and the intangible, as well as between culture and nature, and this interconnectedness remains at the core of indigenous perceptions of culture (van Meijl 2009). Accordingly, if asked which significant cultural elements should be placed at the pinnacle of their identity, most Islanders will list first their dances, songs, oral traditions and important handcraft knowledge before all other elements. Fewer will add old burial grounds, important historical sites, and locations in their landscape linked to past events, to the list. And virtually none will include the numerous archaeological sites only characterized by the presence of old potsherds, shells and burnt stones. These are the faint traces of the deep past, which some communities consider as the ‘dark ages’ of the long-gone and forgotten ancestors (Davidson 1981, pp. 103).

In a stable environmental and ecological island setting, the buried remains of the past were for generations considered as part of the soil. While there was no question about the human origin of the broken artifacts that came out of the ground when a new hole was dug to plant yam or taro, their cultural significance was minimally perceived by the inhabitants. In the last few decades, the introduction of the topic of archaeological research in the islands, with its major focus on excavations, has alerted the Pacific inhabitants about the high significance of these remains (Kirch 2017). Now, the accelerating process of climate change forces our
region to reconsider the meaning and future of long-abandoned everyday items in a completely new way, because these are in danger of disappearing over the coming century. Coastal erosion is affecting most of the seashore and rapidly destroying the associated archaeological and traditional sites in the Pacific. Furthermore, at this stage there has been no adequate consideration of the irreversible loss of this historical and cultural information.

To highlight the risks that archaeological and traditional coastal heritage sites face because of climate change, the first part of this paper will present a number of examples of cultural and archaeological sites under threat in Oceania. Following that, the focus will be on identifying the three major types of recording needed to preserve part of this decaying historical data and which at the same time are achievable given poorly funded and staffed Cultural Heritage Preservation Offices around the region. A change of paradigm is proposed, by empowering the local communities to record their eroding cultural heritage. Effectively this paper presents a ‘tool-kit’, that should allow interested Islanders to become cartographers and archaeological collectors. This is a call to action aimed at the cultural heritage professionals of the region to put the safeguarding of this cultural heritage under irreversible threat on the political agenda of the politicians of the Pacific region.

**Pacific coastal heritages under threat**

Over centuries and millennia of life on large and small landmasses across a seascape covering one-third of the surface of our planet, Pacific Islanders have been linked to the Ocean (Cochrane and Hunt 2018). Seashores have always been attractive loci for human settlements, allowing access to fishing-grounds, opening perspectives for possible long-distance sea-faring voyages, and where trade-winds give a welcome breeze in the settlements of coastal villages. In every Island, first settlement sites – the ‘beginning of history’ – were located on the coast, as the first discoverers arrived via the ocean. In some low-lying islands like atolls, the study of coastal sites is the only way to get an understanding of the human history of the place (Weisler 2001). Natural processes, linked to the deposit of marine sand, coupled in some instances with the downward erosion of inland sediments, combine with human-produced remains like shell mounds, rubbish or ash-layers, to produce over time the formation of superimposed layers. These stratigraphic layers, preserve the evidence of former generations. They also preserve structures and remains that have been willingly buried, like human skeletons, refuse-pits or long-abandoned planting grounds. The progressive accumulation of all these remains creates a sort of ‘history book’, from which archaeologists – through excavations - are able to reconstruct and date past events, former cultural traditions, pottery and tool forms, burial customs, house layouts and settlement patterns.

These coastal environments, containing faint or monumental remains of the past, are under threat due to climate change. The rapid rise of sea levels as well as increased numbers of highly destructive cyclones or typhoons, combine to cause sometimes massive erosion of the shorelines (Mimura 1999). Aside from reducing habitable space for present-day local communities, the rapid disappearance of tens of metres of coastal flats, leads to the erosion of stratigraphic layers, resulting in old items, human bones and shells being washed into the lagoon or onto the reef-flats. These fragile traces of the past are rapidly broken-up by the tides and the surf if they are not immediately collected. The destruction of the original stratigraphic context of these remains, results in a loss of important data which would allow the objects to be dated and analyzed in their historical setting. Once an object has lost its stratigraphic integrity, most of its historical value is also lost. Pacific history is currently destroyed in a lot of islands at high tide. One such example is the low part of the Sigatoka sand dunes in Southwestern Viti Levu (Fiji) (Figure 1), where over the past 20 years, most of the cultural deposits along the coastline linked to the first millennium and a half of Fiji’s human occupation, have been washed away, destroying former settlement remains as well as burial grounds (Anderson et al. 2006). A similar process is at play on the coastal sand-dune of Anakena in Rapa Nui, which is the only beach on the Island and the place where the first discoverers settled about 1000 years ago (Quilliam et al. 2014, fig. 3).
Coastal erosion due to climate change does not only impact buried heritage. It threatens present-day habitations, and other forms of built heritage that has been passed down through generations. Christian heritage, such as churches and chapels, built along the coastline are at risk. Traditional heritage such as abandoned shrines, house platforms, and burial grounds also face destruction. In French Polynesia, the World Heritage site of Taputapuātea on the Island of Raiatea, encompasses numerous Mara’e, all built on a recently formed coastal flat facing the lagoon. Between the 18th and the early 19th century, it was a place of gathering for religious ceremonies, attracting worshippers from far afield in Polynesia (UNESCO World Heritage List, Taputapuātea). As a result of rising sea levels the stone pavements of some of the Mara’e are today under water during extreme high tides and the stone-walls closest to the ocean are progressively collapsing into the sea. In the Caroline Islands, the megalithic town of Nan Madol on the lagoon fringe of eastern Pohnpei Island, has directly been included on the World Heritage List of Sites in Danger by UNESCO (UNESCO World Heritage List, Nan Madol). Built on the lagoon floor, the 110 artificial platforms that span over one kilometre along the coast of Temwen Islet, are today threatened by rising sea levels and stronger climatic events. The outer monumental protective walls, built centuries ago with massive boulders, are being progressively eroded. The local community is worried about the risk of collapse of the huge piled corner-stones of the emblematic Pahnwi platform due to the erosion of the inner fill by tidal waves (Figure 2).

These emblematic examples demonstrate that climate change impacts the layout of important cultural heritage structures still visible on the surface of the Islands. The irremediable loss of this unique deep-history heritage should have prompted a similar alert to that observed for the natural heritage of
Oceania over a decade ago. However, while plants, animals and corals are understandably a focus of the region’s climate change agenda, the threat to significant cultural heritage places and values is not widely recognized. This is particularly true of faint archaeological traces and vernacular built heritage. Discussion as to the fate of these resources and the consequences of their loss is absent from both international and regional meetings. Politicians as well as regional officers do not appear to understand the irreversible destructive process underway and the need to urgently take action on this matter. On the ground, the local Cultural Preservation Offices, in Museums and state departments are under staffed and inadequately funded. They do not have the resources needed to put in place long-term field projects to rescue and record the historical data eroding out of the coastal sites.

**Empowering local communities to record their island’s eroding heritage**

After over a decade of attempts to alert the leaders of the Pacific region about the urgency to include heritage studies in Climate Change funded programs, with a strong focus on coastal erosion, it appears that a change of approach is needed. Accordingly, this paper presents the main elements of an affordable hands-on ‘tool-kit’, the objective of which would be to train the local Island communities to allow them to record their Island’s eroding heritage without the help of professionals. This proposal stems from the evidence that there will never be enough heritage professionals in the Pacific to record the data under threat on every single island. The only people who can contribute to this massive task are each island’s local communities. Accordingly, it is essential that the content of the tool-kit be articulated around three main objectives to be fulfilled by untrained people: (1) to sketch simple maps of eroding surface structures and remains; (2) to record ‘stratigraphic profiles’; and (3) to collect cultural items in ways that will enable professionals to study this data in the future. Relying on a series of experiences with local communities in Fiji on this topic, I will summarise the main principles and the tools that are essential to include in the ‘kit’ to reach these objectives.

a. Simple mapping steps for archaeological and traditional sites

Because the project targets local communities with potentially little background experience or knowledge about mapping, it is essential to propose a restricted number of simple techniques. It must be stated from the outset, that there is no expectation to see untrained people produce highly detailed maps. Field experience has shown nonetheless that local communities have a deep knowledge of their familiar space and landscape and are able to draw useful maps. It is just a matter of getting started and avoiding being embarrassed about one’s drawing skills. A series of steps have been identified in the mapping process and are summarised here.

**Step 1 - Preparations**: establish the overall reason for doing a map. This can be because a heritage site is about to be destroyed, but it can also be because a site is slowly decaying due to natural or human agency, or a demand by the local community. Land ownership is an important issue in the Pacific, and any mapping activity or artifact salvage should be started only after permission is granted by the local landowner(s). A map can be done by cleaning only part of a site or through a series of transects if it is too large.

**Step 2 – The tools**: provide the toolkit to undertake the mapping. The minimum number of tools needed to be able to draw a map and that need to be included in the ‘kit’ are a pen and rubber, graph paper, a ruler, a compass and a tape-measure. These tools need to be accompanied by a simple explanation about how they are used.

**Step 3 – The principles**: highlight the main drawing principles of a field map/sketch, starting with the two main dimensions used in a map: the horizontal and the vertical. The compass is used to fix the orientation, with a main axis towards the north. There is an imperative need to get the understanding of size reduction of the site’s scale to fit the size of the graph paper, by presenting simple mathematic principles of measurement and scales (figure 3). This will explain the recording of the horizontal data, which is the main task of a basic map. This central step of the training is mainly a ‘hands-on’ exercise and is not developed here in more detail.
Figure 3: A simple scale reduction table for mapping beginners (drawing by the author).

Figure 4: Final drawing of an idealised archaeological site with its main attributes and recording details (drawing by the author).
**Step 4 – In 3 dimensions:** detail the more difficult integration of the height and the depth of structures, by discussing examples like house-mounds, burials, fortifications with their walls and ditches and horticultural remains.

**Step 5 – The field map:** focus on the production of a final drawing. The drawer of the original field map/sketch is the person best capable of making an accurate final drawing. The final drawing should be as simple and easily-readable as possible (figure 4). Details of the drawing codes must be included on the final map and a written description of the site has to be included with the map.

**Step 6 – The setting:** identify the site-location in the landscape to allow for future relocation, by recording the traditional name of the site as well as the landowner’s family name and locate it as accurately as possible on a detailed government land map (provided in the ‘tool-kit’). A more accurate geographical position can be gained through the use of a GPS or through the internet with GoogleEarth, which produces coordinates where such technology is available (but this is not provided in the basic tool kit).

b. Recording the stratigraphy of eroding seashore sites

The training in the main principles of horizontal mapping is a pre-requisite before any approach on drawing different superimposed soil/sand layers appearing in a vertical seashore profile (the ‘stratigraphy’). The main focus should be on locations where the remains of human activity (ash lenses with burnt charcoal and stones, pits and post-holes, burials etc.) and/or the presence of human-made objects (pottery, stone flakes, shell items) can be clearly identified. The clearing of the profile with a trowel (provided in the tool-kit) or with a shovel, will allow the visual identification of the different horizontally positioned layers of soil. After having carved a mark between them for easier differentiation, the objective is to make a simple drawing of the thickness of each layer, before numbering them all, starting from the top.

c. The collection of artifacts

Artifacts can often be identified on eroding seashore profiles as well as on the surface of sites. While it is recommended to leave artifacts in situ on the surface of undisturbed portions of sites, artifacts present in the eroding stratigraphic profiles are at risk of loss to the encroaching tide and should be salvaged (it is important that the booklet accompanying the toolkit outlines any legal requirements pertinent to the specific nation). Excavation of the site is not recommended as part of this activity as this is forbidden in most countries unless a proper permit is issued by the State. The removal should only be of the objects appearing in the layer’s profile (human-made objects, shells and wood charcoals for dating etc.), which need to be collected in separate plastic bags (provided in the tool-kit), one for each layer identified. Each plastic bag must be labeled, with the name of the site, the layer’s number, the date of the collection, and the name of the person who did the collection. The remains should be kept in the community house or the medical centre with a map/sketch locating the general position of the seashore profile and a written description of the observations made.

**Discussion: how to implement the ‘tool-kit’**

This paper has highlighted the main components of a simple tool-kit that would allow grass roots communities in the Pacific Islands to record their cultural heritage that is today under imminent threat in coastal settings due to climate change and the effects of sea level rise. A series of training workshops in Fiji have tested the concept, which has proven to be exceedingly efficient (figure 5). The participants have shown that at the end of the training program, they were able to complete a series of usable maps/sketches of sites in their community. A finalised booklet of the different steps summarised in this paper is needed to facilitate this project. In order to be useful, this training booklet would need to be translated into local languages.

It is at this point that the regions’ commitment to the safeguarding and recording of the Pacific cultural heritage under risk will be tested. Funding for the purchase of the material to include in the kit (pen, graph paper, ruler, compass, tape-measurer, trowel, plastic bags, felt pen) will
need to be obtained from donors or an international agency, but to be effective, each Island State should fund its own set of the training booklets. The booklet will need to include an insert outlining any specific heritage law requirement specific to that nation state. The responsibility of fulfilling the translation of the training booklet into its main languages should be given to the different Country States, before sending finalised tool-kit sets (with a geographical map of the Island(s) concerned) to the local coastal communities for use, possibly through each National Office for Cultural Preservation. Furthermore, in order to give weight to the effective use of the tool-kit by the local communities, there will need to be an official endorsement of the project by the local parliament or the Head of State. This will allow the installation of a program of long-term commitment of the Cultural Preservation Offices to collect, in one way or another and at a regular pace, the data compiled by the local communities. This will also force the States to create efficient storage facilities for the curation and safeguarding of the cultural material collected in the different Islands. If this is not officially implemented from the very start, there is a risk that local Island-based efforts will be ruined by the absence of an administrative follow-up at the national level.

**Conclusion**

Over the past decades, heritage professionals around the Pacific have seen the rapid disappearance of part of the most fragile heritage of Oceania through the progressive erosion of all the coastal shores of the Islands. All the attempts made to alert the region’s stakeholders to the immediate danger of irremediably losing part of our past and history, have been overall unsuccessful. There has been no increase in the allocation of funding within the nations of the region to address the protection and study of the built and archaeological heritage. In this period there has been a notable national and international funding investment in the safeguarding and study of the natural heritage, the fate of which has had a much higher profile in local and international media coverage and has attracted substantial philanthropic investment.

Acknowledging this imbalance between cultural and natural heritage in the regional political agenda, the present paper has proposed a ‘hands-on’ solution, promoting the creation of
a simple ‘tool-kit’ that would empower local communities in the recording of their eroding cultural heritage. This method achieves recording of historical sites and artefacts *in-situ* to a professional level. Apart from achieving finalisation of the training booklet for the kit, international, but also nation-based, funding is yet to be secured to finance this project. To be part of an efficient dynamic, this tool-kit must become an element of a wider commitment of the cultural heritage professionals across the Pacific to lobby for a long-term regional plan to safeguard our heritage sites put at risk by the consequences of climate change. It is only through a collective effort that we will secure the financial resources and the trained staff needed to face this huge challenge. If we do not act now, indigenous archaeologists and historians in 50 years will have no sites remaining to tell the old history of the Pacific Islanders. The material traces of all those generations of forgotten ancestors will have by then long since been washed into the ocean.

References


