

# Where are the Neolithic Landscapes of Ilocos Norte?

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## Abstract

*This paper reports the results of an archaeological survey in Ilocos Norte in February 2008. It is suggested that problems associated with postglacial valley incision and subsequent Holocene infilling will result in a very fugitive record for the Neolithic, unless very deep prospecting is carried out, beyond the ability of field teams with hand augers. A presence of large shell middens can alleviate this problem, as in the Cagayan Valley, but none are reported from Ilocos Norte, owing perhaps to an absence of suitable estuarine conditions for dense shellfish populations. Ilocos Norte undoubtedly has a rich Neolithic archaeological record, but finding it might not be easy.*

## Background

In February 2001, en route from Manila via Laoag to the Batanes Islands, Bellwood and Dizon flew over Paoay Lake on approach into Laoag airport. The lake was not visited on this occasion, but the brief aerial view suggested that the sand dune and lake complex would be

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interesting from both palaeoenvironmental and archaeological viewpoints.

In 2003, the bed of Paoay Lake was cored by Stevenson to obtain a palynological (pollen) history. The result was a 7000-year pollen sequence, with a fairly sudden disappearance of pine pollen between 4500 and 5000 years ago, and its replacement by grassland pollen (Bellwood *et al.* 2003:154-158). It was (and still is) unclear if this major floral change was associated with human activity, or autonomous climate change, or both. The possibility was raised that humans might have increased the intensity of the fire regime, thus disturbing the ecological balance that allowed the pine forest to exist sufficiently close to Paoay Lake for its pollen to be incorporated in the sediments (pine forests in the Philippines only grow today above an altitude of 600 metres). However, no relevant Neolithic archaeological record with which to address the human impact issue existed for Ilocos Norte, even though the Cagayan Valley had some tantalising evidence for a Neolithic human presence by or even prior to 4000 BP (Pamittan site; Tanaka and Orogo 2000).

In 2003, a very brief archaeological survey was undertaken of the Paoay Lake shoreline and the adjacent dunes, but nothing was found, apart from late period earthenwares and associated Chinese ceramics. So we returned in February 2008 with augering equipment to undertake a more thorough search, both for archaeological and for pollen sites.

### **The February 2008 Results**

From February 11 to 16, 2008, a joint National Museum/Australian National University/Archaeological Studies Program, University of the Philippines team (see Acknowledgements) surveyed the Paoay Lake region of Ilocos Norte with the hope of finding further lake sites and Neolithic occupations. A map of the locations visited, and a possible reconstruction of the mid-Holocene coastline of the region, to be discussed below, is shown in Figure 1.

### ***Pollen Sampling and Lake Coring***

The 2008 field season included a search for additional palaeoenvironmental sites to compliment the Paoay Lake record and, thus, help unravel the sequence of environmental change recorded within the lake sediments. However, unfortunately, no additional lakes could be found in this very seasonal landscape of Northern Luzon. Paoay Lake in

many ways is an anomaly in the landscape, with the only other significant water bodies being meander cut-offs on the major river systems that have generally undergone some degree of modification, usually by human excavation. Some lakes may exist at altitudes above 2000 metres in the Central Cordillera, as they do further to the south; however, the political situation in this part of northern Luzon means that safe travel in the mountains cannot be guaranteed by the authorities.

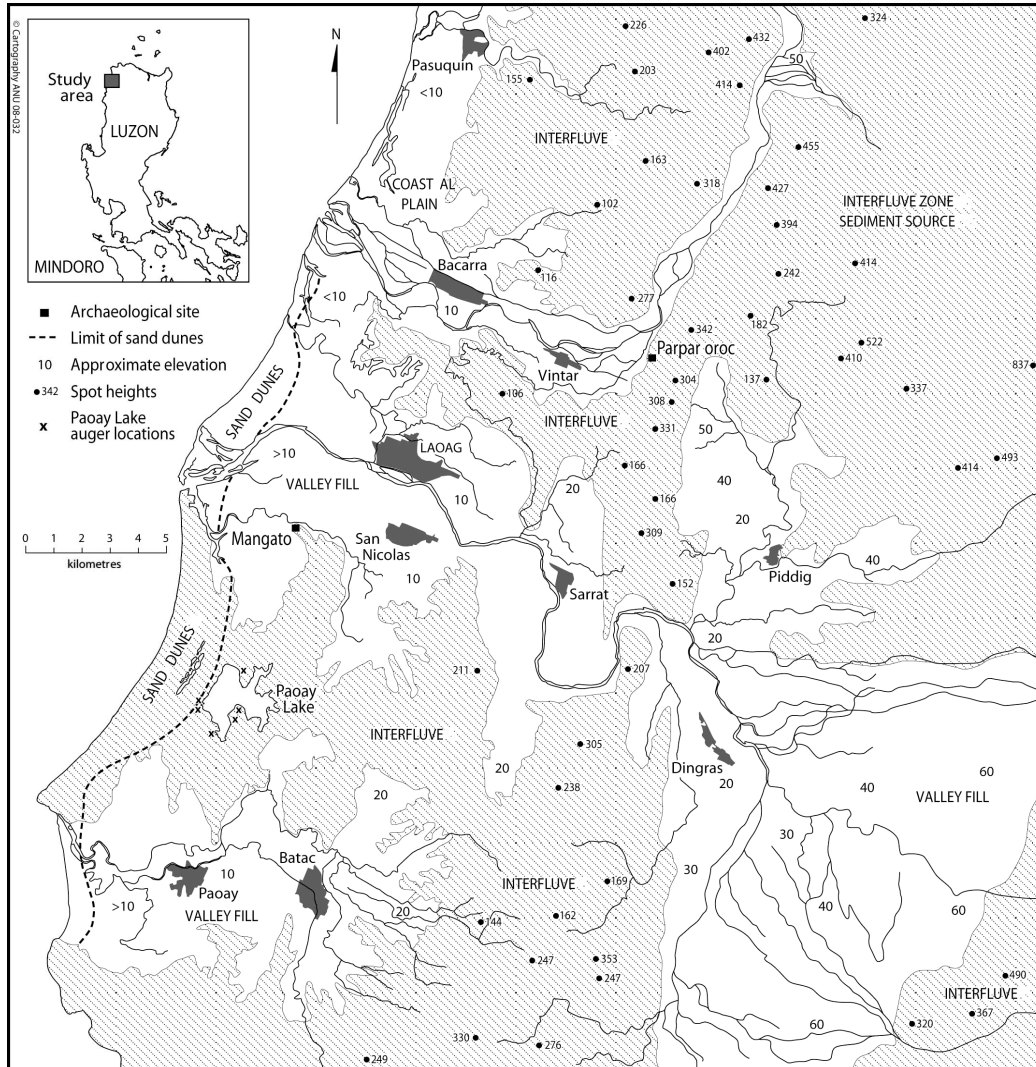
Another aspect included the collection of modern surface pollen samples to gain a better understanding of modern pine pollen deposition in the environment and, thus, to make an assessment of whether or not pine forests were ever growing below their current lower limit of 600 metres above sea level during the Holocene. Modern surface samples for an assessment of the modern pollen spectra were collected in a transect that started at an altitude of 1500 metres in pine forest on Mount Lammin and extended down to rice fields in the lower Laoag River valley. Given the extreme seasonality of Northwestern Luzon, the sampling substrates on Mount Lammin were not ideal. We need to await laboratory processing of the samples before the pollen content can be assessed.

Finally, the rice fields in the sand dune swales between Paoay Lake and the coast were cored for pollen; however, the cores are short (less than one metre) and likely to represent the historical period only.

### *Archaeology - Parparoroc*

We began our archaeological survey with a visit to Parparoroc, a hamlet about 2.5 kilometres east of the town of Vintar, on the southern bank of the Vintar/Bacarra River system. The site was the find place of a cache of five stone adzes, reported by Paz *et al.* (2005). They were found together during construction activities on a hillside, in total isolation and with no sherds or other archaeological materials in association. We also found nothing of an archaeological nature on visiting the site – this was clearly a deliberately buried cache, perhaps of heirloom items. From Batanes and Cagayan Valley parallels, the trapezoidal-sectioned adzes could well date to between 2000 and 3500 BP in terms of manufacture; however, we have absolutely no idea when or why they were buried.

We also augered several holes in the flat river terrace below the find place, running across the cultivated ground from the base of the hill out to the current river channel. This was done on the assumption that



**Figure 1.** The study area within Ilocos Norte Province. The Mangato and Parpararoroc archaeological sites are marked. The low-lying fills of the deeply incised valleys mark areas of possible inland extension of mid-Holocene estuaries, although precise shoreline locations at specific dates are not known. If such estuaries still existed in 1500 BC, they could have played a major role in the location and subsequent deep burial of Neolithic sites. (elevations and spot heights are in metres).

perhaps, ancient people were living on the edge of the alluvial plain, since the hill itself had no traces of archaeology apart from the adzes. All these auger holes went through archaeologically sterile alluvial silt down to former river bed cobbles at about two metres depth, which forced us to stop augering. Thus, the Parparoroc site has revealed absolutely no trace of human occupation, apart from the adzes. None of the modern inhabitants have ever found sherds, apart from fragments of imported ceramics.

### *Paoay Lake*

Several auger holes were sunk in and around the terraced tobacco fields at the end of the Sungadan Peninsula on the southern Paoay Lake shoreline (Barangay Sungadan). We also augered along the inland edge of the coastal sand dunes in Barangay Nagbacalan and along the coastline below the Malacañang of the North. The results were again absolutely negative – all the auger holes were completely sterile archaeologically, without even charcoal flecks. Ceramic and recent earthenware litter the modern ground surface and lake shoreline around the Sungadan Peninsula; however, these clearly come from the modern houses and their immediate predecessors on the top of the peninsula. Examination of road cuttings in the Sungadan peninsula also revealed absolutely no archaeological materials, apart from a complete and chronologically recent earthenware pot near the ground surface, exposed by road bulldozing. Thus, similar to Parparoroc, the immediate environs of Paoay Lake have also revealed no archaeology, in auger holes sunk to depths of up to three metres.

Local tradition holds that the lake once supported stilt houses, and if this is true, there may well be significant material in the lake bed. Diving to the lake bed and examining any contents by feel in the rather opaque conditions that would be produced by such activities (as carried out under Bellwood's direction in the bed of Lake Mangakaware in the Waikato region of New Zealand; Bellwood 1978) would perhaps yield organic and especially wooden artefacts. However, we would have to drain the lake by around four metres to expose such artefacts for proper excavation – unlikely to be a popular option for a valuable irrigation resource.

### *Paoay Town*

After Paoay Lake, we decided to move into Paoay town, on the assumption that a pre-Spanish population must have been living here before the 1699 commencement of construction of the church, as documented by earlier excavation inside and outside Paoay church and the recovery of pre-Spanish burials by Dizon and Bautista (2000). The ground level around the church has presumably risen little since 1699, suggesting that high energy alluviation no longer occurs on this particular site, even though informants in Paoay told us that the Lawa River still floods into lower-lying areas quite close to the church.

To assess the situation and to see if we could find buried prehistoric sites within reasonable reach of the modern ground surface (i.e., above the water table and hopefully not more than about three metres down), we decided to auger a series of six holes on a south to north alignment, starting from the Rectory garden immediately north of the east end of the church. From this location, we progressed northwards through the grounds of the ruined convent to the north, and into another garden owned by the Duque family behind the convent, about 200 metres south of the current (dry in February) bed of the Lawa River. The six holes, thus, spanned a 200-metre extent of alluvium through the centre of the modern town. In the two auger holes closest to the river, about 200 metres north of the church, we found dark soil, charcoal, and sherds at about 1.5-2 metres; however, expectations shrank when a blue and white sherd also emerged from the same depth. Clearly, considerable alluviation has occurred in this particular area, perhaps because it was originally low lying. The other auger holes were all sterile down to the water table; although we know from the previous Paoay church excavations by Dizon and Bautista, plus the 2005 digging of a rubbish pit in the convent garden, that pre-Spanish burials with Chinese ceramics occur here and there to a depth of two metres.

It should be noted that we normally stopped augering at the water table, between two and three metres below the present surface, because of the difficulty of pulling out the auger and the tendency of the holes to collapse in waterlogged circumstances. Had we continued the auger holes to depths of five or more metres, we might have found our Neolithic needles in the Neolithic haystack, but such findings would be totally inaccessible for excavation purposes.

After all this negative augering, our suspicions were aroused,

especially when all questions about the finding of earthenware pottery sherds (*palayok*) were answered with negative shakes of the head. Barangay captains, farmers, and village elders all had no knowledge of anyone ever finding potsherds, except for the single site of Mangato, described below. It was clear that Neolithic and even Metal Age remains never occur on or close to the contemporary ground surface in Ilocos Norte, at least, not in the regions visited by us.

### ***Mangato***

We did locate the site at Mangato, following information given by Paoay Rectory gardener Mr. Nanding Larios, on the sides and around the base of a small hill about 30 metres high that projects almost to the Mangato River near the village of Mangato, about 300 metres east of the bridge on the main Paoay-Laoag road. The site extends above and behind St Mary's Seminary and a group of houses outside the seminary wall. A sloping layer of sherds was first shown to us by the inhabitants of the houses, about halfway up the hill, exposed in a baulk left between two rubbish pits cut into the hillside. We cleaned one of these sections and sampled the pottery, which consisted of some recent earthenwares and a majority of Chinese ceramics, mostly apparently of Song and Ming date (no blue and white). No older material was found in this assemblage. This pottery had presumably washed down from the hilltop; however, nothing survives up there now, as clearly revealed by a three metre deep treasure hunter's pit near the top of the hill which simply revealed a section of archaeologically sterile soil and river pebbles, clear signs of the dissected river terrace origin of the high ground to which the hill belongs.

Since a few sherds were also seen around the base of the hill, we decided to excavate a 1X1 metre square and sink two auger holes in the cultivated upper terrace which lies between the bottom of the hill and the current floodplain of the Mangato River. However, we found absolutely nothing. One of the villagers showed us two small trapezoidal-sectioned stone adzes which he collected at the base of the hill a few years ago, apparently mixed with the hill slope of Chinese pottery. However, how seemingly Neolithic stone adzes come to be associated with Chinese sherds remains a mystery. We also found the butt end of a similar stone adze when we were collecting on the site. Mangato certainly has no surviving Neolithic pottery on the ground surface, and if there was once a Neolithic occupation here, no coherent trace exists now.

### **Why are pre-porcelain sites so hard to find in Ilocos Norte?**

The situation just described appears to be identical to that on the large northern coastal plains of Northern Sumatra, Java, and Bali, as well as Western Taiwan. The Neolithic is completely absent in any visible form on the ground surface. Why?

In Western Taiwan, Neolithic sites were totally unknown in the coastal plain, despite being present in the hills above, until the discovery of the waterlogged Neolithic sites at Nanguanli (5000 – 4500 BP) in the Tainan Science-Based Industrial Park. These sites lie seven metres underground, below the water table and virtually at modern sea level (Tsang 2004). They were discovered by deep earthworking projects for factory and underground car park construction.

The coastal plains of Northern Sumatra, Java, and Bali also have no reported Neolithic sites - all are in caves or rare open sites in hilly interior regions. The experience of Ardika and Bellwood (1991) at the site of Sembiran on the relatively narrow northern coastal plain of Bali showed that layers only 2000 years old lie three metres down, at or below the water table. Such observations indicate that large coastal plains in the gently shelving continental portions of tropical Southeast Asia (interior Sundaland) have been subjected to rapid burial during the Holocene, probably in excess of 10 metres during the past 10,000 years, or at a rate of *at least* one metre per millennium, an observation also supported by the buried Hoabinhian shell middens in northern Sumatra (Bellwood 1997:169). These landscapes have changed with incredible rapidity.

The coastline of Ilocos Norte, however, differs from the gently shelving coastal plains just discussed in Northern Sumatra, Java, Bali, Western Taiwan, and for that matter, Southern New Guinea (Chappell 2005), in one extremely important respect. There is no continental shelf drowned by shallow postglacial sea. Luzon does not lie on the Sunda Shelf and has never been joined to mainland Asia by exposed land bridges. The sea bed plunges rapidly offshore around most of the island, as in the Philippines generally. Therefore, when world sea levels were 130 metres below those of the present at about 20,000 years ago, at the peak of the last high latitude glaciation, the rivers that flow from the interior mountains to the sea in Ilocos Norte were, in their lower courses, deeply incised into valleys cut down to the lowered sea levels. These valleys would have cut back inland as gorges, headed by knick points that would have migrated progressively upstream through headward river bed



erosion. Thus, the lower courses of the Vintar/Bacarra, the Laoag and the Lawa rivers, together with their tributaries, would have been located well below their present absolute levels at this time.

Postglacial sea levels rose rapidly between 17,000 and 6000 years ago, and the sea must have flooded these deeply incised river valleys. Exactly how far inland the sea extended in each case we cannot know without geological drilling in the valley bottoms themselves. During glacial-interglacial cycles, these lower river courses presumably cut down and then refilled their valleys many times, each time cutting down through previous alluvial fill (sand, silt, boulders, as opposed to bedrock). The fill itself has been derived from erosion of the steep and tectonically unstable Central Cordillera Mountains. Certainly, the wide and flat valley bottoms that characterise the lower courses of the rivers in Ilocos Norte today are suggestive of such processes – they all give the impression of being “filled to the brim” with recent coarse sediment. When one looks across the bed of the Laoag River today, in the vicinity of Laoag, or the other more inland towns such as Piddig, Sarrat and Dingras, one sees a wide flat expanse of boulders, standing water and sandy alluvium (Figure 2).

We propose that, between 4500 and 4000 BP, when Neolithic settlers from Taiwan probably first reached this coastline, the configuration of land and sea was quite different from that of today, and Ilocos Norte may well have been characterised by extensive drowned river valleys. Sea levels had probably stabilised well before 4000 BP; so these valleys were perhaps already filling with sediment, but presumably insufficient time would have passed to fill them to their present levels. Long estuaries would still have fingered far inland, attractive for Neolithic settlement. It seems unlikely that the Neolithic settlers themselves would have had a lot of impact on such large and dynamic river systems, comparable for instance to the current level of deforestation, although direct evidence for or against this is not available at present. Unfortunately, it is impossible for us to test our proposed model of incision and aggradation in such large river systems with the equipment and resources available to us. Such a program would require geological drilling through the alluvial fills of these lower valleys to reach presumed layers of postglacial marine/estuarine sediment and then establishing a chronological history.

The best-researched example of such valley drowning by rising postglacial sea level in the general Southeast Asian region comes from

Northern New Guinea, another coastline without a continental shelf, where the down-cut Sepik Basin was filled by rising postglacial sea in its lower course to a point over 100 kilometres inland until about 3500 years ago (Chappell 2005). The broad inland plain of the Laoag River could, thus, have been a smaller version of the Sepik Inland Sea. Such inland seas would have been short-lived in geological terms during the Pleistocene, with its 125,000 year cycles of glaciation, being filled progressively by sea water only during the millennia of postglacial sea level rise (17,000 to 6000 years ago in the last instance, when sea levels stabilised) and then infilled with sediment until the next glacial low sea level stand. However, these small inland seas are of great significance archaeologically since they existed at the time of Neolithic settlement of Luzon and present us with the problems of site location discussed in this report.

Our current research in the Cagayan Valley is also suggesting that the sea reached quite far inland here during the Holocene (Maluyo core near Allacapan – still under analysis), and that Neolithic sites once close to the estuary shoreline, such as Nagsabaran, have been buried under about three metres of sediment and shell midden since 3500 years ago. Of course, these shell middens are one reason why Neolithic and Iron Age sites are so easy to find in Cagayan, since many are up to five metres deep and outcrop at ground level. The Ilocos Norte coastline and Paoay Lake do not have such rich shellfish resources as the Cagayan River, at least not under present environmental conditions during the late Holocene, and shell middens have never been reported from this province. The mid-Holocene estuaries proposed in this paper might have supported good shellfish resources during the Neolithic, but we cannot know this without discovering the sites!

The assumption from our geomorphological reasoning is, therefore, that Neolithic settlers reached Ilocos Norte that likely had many large estuarine embayments until 4000 years ago or less, after which they were gradually aggraded to modern sea level and above by the huge sediment loads carried by the high-energy river systems. Neolithic settlers would have built their villages close to the rivers and estuaries, near sources of fresh water, at altitudinal levels possibly many metres below the current surfaces of the valley fills that rise inland to about 20 metres or more above modern sea level (Figure 1). Such great depths might reflect postglacial tectonic uplift, or could simply be due to thick alluvial accumulation alone from nearby rich sediment sources. Thus, many



**Figure 2.** The Laoag Valley near Sarrat: Was this broad and flat expanse of alluvium part of an extensive estuarine inlet during the Middle Holocene?

Neolithic sites are buried forever, short of massive deep level construction activities or mechanical drilling, several metres down and beneath the modern water table.

One might ask why we do not find Neolithic sites on hill tops, such as Mangato. Possibly the occupations have long since washed off into the alluvial terraces below. Perhaps early Neolithic settlers had no need to live on hilltops, away from water and their crops, which probably included rice. We are not sure, and it is quite likely that Neolithic sites will one day be found on rare hilltops – someone has to look. However, modern villagers do not report such sites.

Interesting final questions concern the timing and magnitude of the modern valley fills. Doubtless, some inflow of material into valleys from the highlands has occurred throughout geological time. However, how has this changed during the late Holocene with the arrival of Neolithic people, and especially during historical times? Has most of the alluviation occurred in recent centuries, as populations and pressures on land have increased to modern levels? We are currently working on these questions from both palaeoenvironmental and archaeological perspectives. The Paoay Lake palynological sequence, with the disappearance of the pine forest between 4500 and 5000 years ago, is obviously very relevant for these questions.

## **Conclusion**

Finding no Neolithic sites in Ilocos Norte has had one good outcome because it has made us think in new ways. Sometimes, negative situations can have their uses. We now need to consider the histories of the Ilocos Norte river systems through the past 10,000 years in more detail and to hope that one day, some Neolithic archaeology will be recovered from deeply buried estuarine coastlines under the surfaces of the modern valleys.

## **Acknowledgements**

The 2008 team consisted of the following:

*National Museum of the Philippines* – Dr. Eusebio Dizon, Gay Lacsina, Tony Peñalosa, Jonathan Jacar, Adan Soriano, and Ruffy Flores; *Australian National University* – Dr. Peter Bellwood and Dr. Janelle Stevenson; and *Archaeological Studies Program, University of the Philippines* – Dr. Armand Mijares and Emil Robles

We wish to thank Dr. Corazon Alvina, Director of the National Museum, for support and the loan of a vehicle for the fieldwork. Michael Marcos Keon, Governor of Ilocos Norte, also provided support, loaned a vehicle to Janelle Stevenson, and provided security for the pollen-collecting trip into the mountains. We wish also to thank Irene Marcos-Araneta for her support.

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