ARCHAEOLOGICAL RESEARCH AT KENDENG LEMBU, EAST JAVA, INDONESIA

Sofwan Noerwidi

Balai Arkeologi Yogyakarta, Jl. Gedongkuning No. 174, Yogyakarta 55171, Indonesia.
Email: sofwan_noerwidi@yahoo.com; sofwan.noerwidi@arkeologijawa.com
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ABSTRACT

This report describes new excavations at the site of Kendeng Lembu in East Java, a location previously researched by van Heekeren and Soejono. The new research in several locations has revealed a Neolithic layer with red-slipped pottery, and a separate historical period layer above.

INTRODUCTION

Java is the most densely settled island in the Indonesian Archipelago. From genetic and linguistic perspectives, the indigenous population of the island comprises an Asian-affiliated people who speak Austronesian languages. But, reconstruction of the colonization process of Java by the ancestors of the modern people is still difficult. At present, the most widely accepted explanation for the dispersal of Austronesian-speaking people is the Blust-Bellwood model derived from a comparison of historical linguistic and archaeological data. Their Out of Taiwan theory proposes fairly rapid Austronesian expansion from Taiwan starting from about 4000 BP into the islands of Southeast Asia via the Philippines, and then into Island Melanesia, Micronesia and Polynesia. Beforehand, Taiwan was colonized by an agricultural population from South China, perhaps via the Penghu Islands (Pescadores), about 6000 BP (Tanudirjo 2006: 87).

From a linguistic perspective, Robert Blust (1984/1985) has suggested the existence of a Java-Bali-Sasak subgroup, closely related to the Malayo-Chamic languages in western Indonesia and Vietnam, and to the Barito language in South Borneo (including Madagascar). He suggests that a common proto-language was spoken in southeast Kalimantan approximately 1500-1000 BC, and that the above languages were separating around 800-1000 BC. From the archaeological evidence and linguistic reconstruction, an array of material culture can be associated with the early Austronesian community moving from Taiwan, including millet and rice agriculture, domesticated dogs and pigs, pottery manufacture, and weaving (i.e. spindle whorls of baked clay). The archaeological details reveal that the pottery was initially cord-marked (in Taiwan) and/or red-slipped, later with stamped and incised decoration. Other artifacts associated with early-Austronesian dispersal include polished stone adzes, slate points and knives, Taiwan nephrite tools and ornaments, stone barkcloth beaters, and notched sinkers (Bellwood and Dizon 2008). Several of these categories, especially the red slipped and stamped pottery, moved through eastern Indonesia and the Marianas Islands, entering Oceania in the form of the Lapita cultural complex (3350-2800 BP) (see Bellwood 2006: 68). However, archaeological evidence to test Blust's linguistic hypothesis has been rarely found in Java.

A number of open air Neolithic habitation sites have been found in Indonesia, and several have been quite intensively researched, such as Kamassi and Minanga Sipakko in West Sulawesi (3500-2500 BP: Simanjuntak et al. 2008), and Punung in central Java (2100-1100 BP) (Simanjuntak 2001). However, Kendeng Lembu in East Java is one of only two pure Neolithic habitation sites in Indonesia, the others being the Karama River (Kalumpang region) sites in West Sulawesi mentioned above. The recent development of research on Kalumpang makes it necessary to recover comparative data from Java, in order to understand early Austronesian colonization of that island.

PREVIOUS RESEARCH AND RESULTS

Kendeng Lembu was the first Neolithic settlement to be reported in Java, by W. van Wijland and J. Bruumun in 1936. This site is located in a rubber estate in Karangharjo village, south of Glenmore and half-way between Jember and Banyuwangi (Fig. 1). H. R. van Heekeren started systematic excavation there in 1941, but after a few days had to stop due to the World War II Japanese invasion. Unfortunately, his artifacts and field notes were destroyed during the Japanese occupation of Java (Heekeren 1972: 173).

A second investigation was led by R.P. Soejono from the Prehistory Department of the National Archaeological Institute of Indonesia from January 15 to February 4 1969. He recorded two main cultural layers in Kendeng Lembu; an upper historic (Majapahit) layer and a lower Neolithic one. The historic layer contained Chinese cash (*kepeng*), sherds of wheel made pottery, fragments of brick, and fragments of porcelain. The Neolithic materials included several polished adzes and roughouts, grindstones and anvils, many flaked lithics, and sherds of coarse red burnished pottery (Heekeren 1972: 175-179;

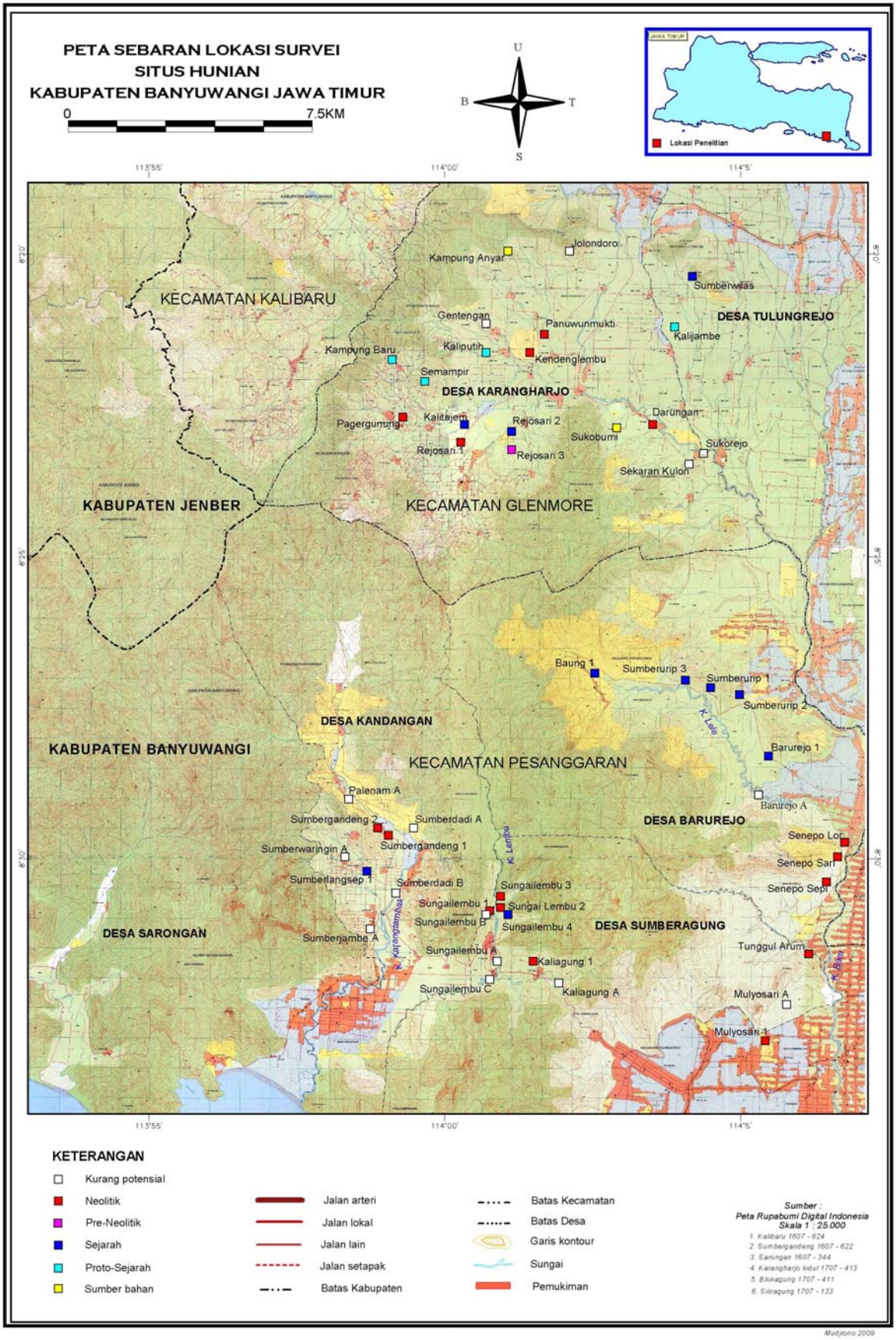

Figure 1. Archaeological sites in Kabupaten Banyuwangi, East Java.

Soejono 1984: 176). However, no absolute dates were reported. Soejono reported that the stone adzes were all rectangular cross-sectioned, and the pottery simple and utilitarian (Heekeren 1972: 184).

Later research at Kendeng Lembu was led by Goenadi Nitihaminoto from the Archaeological Office of Yogyakarta from February 19 – 28 and October 1 – 13, 1986. As Soejono, Nitihaminoto found two cultural layers at Kendeng Lembu, historic and Neolithic. In his Sector XIX, on the hill top, he found the highest density of material. Nitihaminoto also carried out a survey at Kalitajem, about 3 kilometers southwest of Kendeng Lembu, recovering several adze roughouts, flakes and sherds of coarse pottery (Tim Ekskavasi 1986/1987: 7). Since then, no further research has occurred, until now.

Geographically (see Sunarto 1987), Kendeng Lembu is located on the southern slope of the Gunung Raung volcano (3332 m), at 8° 21’ 37.6”S and 114° 01’ 20.7”E, and at an elevation of 203 m above sea level. The average temperature of this location is 25° Celsius and average annual rainfall is 2507 mm (Koppen Af). The site is on a fluvio-volcanic fan with three types of soil; alluvium, regosols derived from tuff, and latosols from lava. Most soils have high porosity and permeability, and the area is now under rubber and cacao plantations, with occasional rice fields.

SURVEY

Surface surveys of Kendeng Lembu and Kalitajem were conducted before excavation. The most productive areas at Kendeng Lembu were on the top of the hill excavated by van Heekeren and Soejono, and on the flat south of Gunung Kambang. At Kalitajem, the most productive locations were on top of the hill and down the eastern slope. We selected three locations to open test pits at Kendeng Lembu (KDL), and one test pit was located on top of the hill at Kalitajem (RJS).

Surface survey also covered the main Kali Baru stream, from Kendeng Lembu downstream to the Indian Ocean. We found 19 sites dating from the pre-Neolithic phase into the historic. Nine of these were Neolithic habitation and workshop sites, including 4 quarry locations in a green-grey silicified claystone. There appear to be separate “Kendeng Lembu Basin” and coastal site clusters, linked by the river. The Kendeng Lembu cluster includes sites at Kendeng Lembu itself, Panuwunmukti, Kampung Anyar, Treblasala-Rejosari (formerly termed Kalitajem), Pagergunung, Sukobumi, and Darungan. The coastal cluster seems to lie along the approximate coastline of 4000 BP, based on van Bemmelen’s suggestion that the southern coast of Java has been aggrading at a rate of 2 cm every year (Bemmelen 1949; Poespowardoyo 1981). The sites include Senepolor, Seneposari, Seneposepi, Tanggul Arum and Mulyosari.

THE EXCAVATIONS

We excavated 4 1.5 x 1.5 m² test pits in total, three at Kendeng Lembu (KDL TP I – III) and one at Rejosari (formerly called Kalitajem) (RJS TP I). In each square, the first three spits disturbed by rubber plantation activities were 10 cm thick, then 5 cm thereafter.

KDL TP I (Table 1, Fig. 5)

TP I at Kendeng Lembu (KDL TP I) was situated near the area excavated by van Heekeren and Soejono, at 8° 21’ 37.6”S and 114° 01’ 20.7"E, at an altitude of 203 m above sea level. The square was dug to 75 cm and the stratigraphy contained five sedimentary layers, from top to bottom (1) dark brown sandy clay, (2) brown sandy clay, (3) bright yellowish brown tuff, (4) dark brown clay and (5) dark black brown clay.

The upper two layers are historic in cultural contents, and the two bottom are Neolithic. The bright yellowish brown tuff in between is culturally sterile. The historic assemblage contains wheel made Majapahit (XIII-XV century) sherds, mainly red in colour. The Neolithic assemblage contains red-slipped pottery and stone tools, together with baked clay lumps and charcoal. The potsherds are technologically handmade, but very fragmentary, making it difficult to reconstruct complete shapes and sizes. Three flaked stone artifacts of green-grey silicified clay also occurred in the Neolithic layer, in spits 10 - 11.

Table 1. Archaeological finds by depth from KDL TP I.

DEPTH	LAYER	LITHICS	SHERDS	BAKED CLAY LUMPS
surface	-	5		
0-10	1			-
10-20	1		7	
20-30	1		37	37
30-35	2		85	18
35-40	2		66	2
40-45	2		19	
45-50	3		1	
50-55	3		1	
55-60	4		6	37
60-65	4	1		45
65-70	4	3	3	14
70-75	4		6	

KDL TP II (Table 2, Fig. 2)

KDL TP II was opened on flat land south of Gunung Kambang, 300 m northwest of KDL TP I, at an altitude of 232 m above sea level. The square was excavated to 60 cm depth at bedrock, with four layers: (1) dark brown sandy clay, (2) bright yellowish brown tuff (as layer 3 in KDL TPI), (3) dark black brown clay, and (4) dark blackish brown clay mixed with fragments of the yellowish brown clay stone bedrock. KDL TP II produced only Neolithic artifacts, except for a few Majapahit sherds in a disturbance in the SE corner. Distributions are shown in Table 2, and a considerable density of stone working debitage was found at 40-55 cm.

KDL TP III (Table 3, Fig. 3)

KDL TP III was located between TP I and TP II on a flat area on the southern slope of Gunung Kambang, approximately 150 m north of KDL TP I and 200 m east of

KDL TP II, at 8° 21” 33.3’S and 114° 01” 19.0’E and at an altitude of 195 m above sea level. The stratigraphy consisted of five layers, from top to bottom (1) reddish brown fine sand, (2) yellowish brown tuff (as layer 3 in KDL TPI), (3) dark brown silty clay, and (4) black brown clay. This square yielded only historic materials (Fig. 3).

Table 2. Archaeological finds by depth from KDL TP II.

DEPTH	LAYER	LITHICS	SHERDS
0-10	1	21	1
10-20	1	31	7
20-30	1	13	24
30-35	2	5	6
35-40	3	27	0
40-45	3	189 debitage	16
45-50	3	127 debitage	8
50-55	4	36 debitage	0
55-60	4	12	
Bedrock			

Figure 2. Large flake, cortexed pieces and chips from KDL TP II.

RJS TP I (Figs 6,7 and Table 4)

The square at Rejosari (RJS TP I) was located on top of a hill near the border between Kendeng Lembu and Trebla-sala estates, in Rejosari hamlet, at 8° 23” 09.7’S and 114° 00” 16.4’E, and at an altitude of 238 m above sea level. The stratigraphy consisted of five layers, from top to bottom: (1) reddish brown sandy clay, (2) dark brown clay, (3) bright yellowish brown tuff (as layer 3 in KDL TPI), and (4) dark black brown clay.

Layers 3 and 4 contained Neolithic artifacts, and the bright yellowish brown tuff of layer 3, as in the Kendeng Lembu squares, was derived from volcanic activity, probably from Mount Raung. The two upper layers contained mixed materials, including disturbed Neolithic remains. Therefore, RJS TP, like KDL TPII, produced mainly Neolithic settlement and workshop materials.

Table 3. Sherd and baked clay distributions by depth from KDL TP III.

DEPTH	LAYER	SHERDS	BAKED CLAY LUMPS
Surface	-	25	
0-10	1	14	
10-20	1	3	
20-30	1	24	
30-35	1	43	
35-40	1	19	1
40-45	1	42	2
45-50	1	21	
50-55	2	14	12
55-60	2		30
60-65	3		60
65-70	3		50
70-75	3		35
75-80	3		22

Figure 3. Rim, spout and red-slipped body sherds of Majapahit style from KDL TP III

DISCUSSION

According to the excavation results, two main cultural layers were present at Kendeng Lembu, that is Neolithic and Majapahit, separated by a sterile layer of volcanic ash. As far as the Neolithic layers are concerned, KDL TP I yielded mainly evidence for habitation activity based on the range of materials recovered, whereas KDL TP II appears to have been the location of a stone workshop, using a green-grey silicified claystone, perhaps collected from the Sawojajar River at Kampung Anyar,

Figure 4. The Kendeng Lembu Basin, surrounded by the Merawan Mountains.

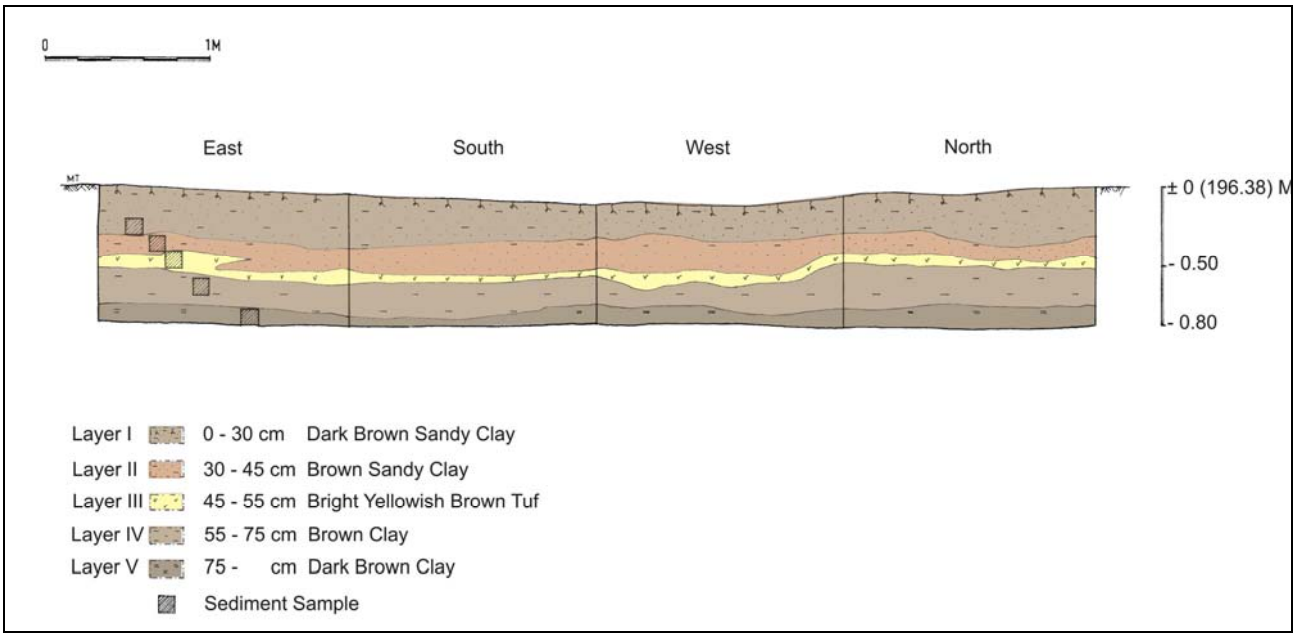

Figure 5. Section of KDL TP I.

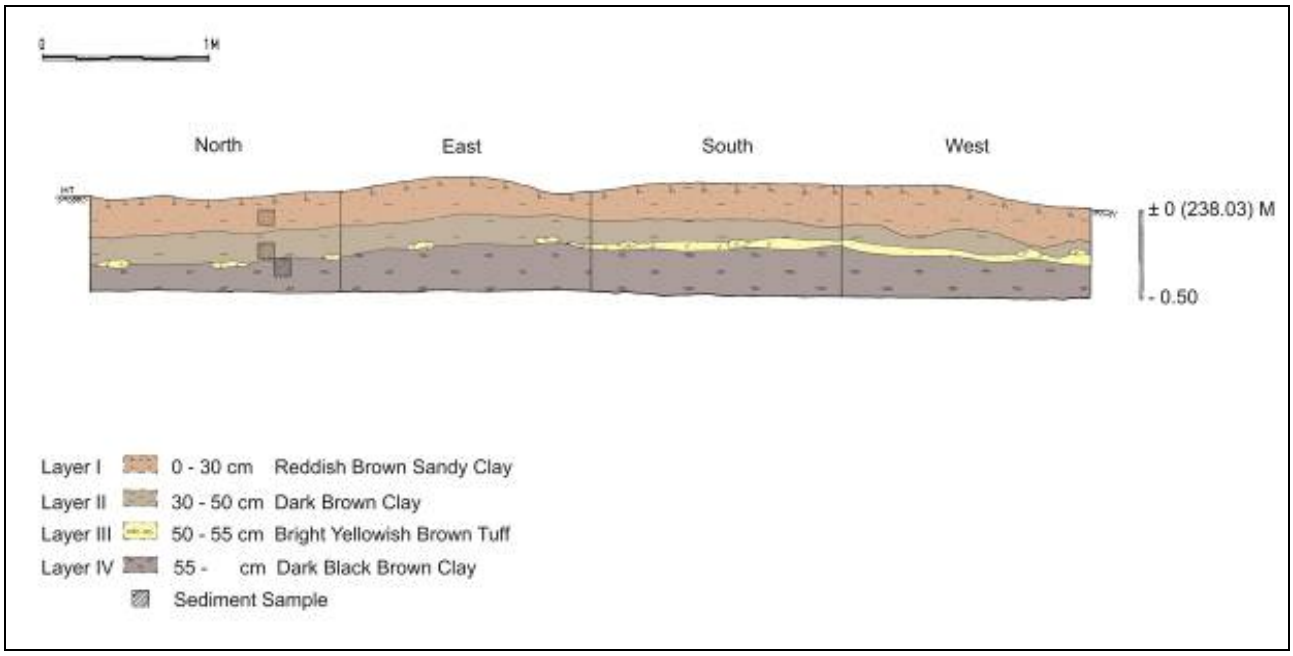

Figure 6. Section of RJS TP I.

three km north of Kendeng Lembu. KDL TP II produced a lot of lithic raw materials, debitage and roughouts. In Rejosari (Kalitajem), we also found evidence for Neolithic habitation and workshop activities. Rejosari yielded two kinds of raw material for lithic artifacts; green-grey silicified claystone and grey sandstone. Possibly, the grey sandstone was brought from Gunung Lembu, near Sukobumi hamlet, about 6 km east of Rejosari. The Kampung Anyar source of the green-grey silicified claystone lies 7 km to the north. In our surface survey at Sukobumi we found a third lithic raw material, a brown silicified claystone, brought from Seneposari near the coast about 12 km to the south. This suggests Neolithic interaction between the inland and the coast, via the Kalibaru River.

Sediment samples were taken from every stratigraphic layer in all excavations, and examination for starch and phytoliths from KDL TP I is being undertaken Mahirta at Gadjah Mada University, Yogyakarta.

AUSTRONESIAN COLONIZATION AT KENDENG LEMBU

Where did the Neolithic inhabitants of Kendeng Lembu come from? In terms of linguistic evidence, Blust (1984-5) has proposed that the Javanese subgroup of languages separated from the Barito River area of southeast Kalimantan at around 1000-1500 BC. The up-river movements required to reach Kendeng Lembu perhaps were similar to the Austronesian colonization of West Sulawesi through the Karama valley, from Tasiu, Sikendeng and Lattibung downstream, up to Minanga Sipakko, Kamassi and Tambing-Tambing in the upper course (Simanjuntak 2006; Bellwood 2000).

Figure 7. Adze roughout of green-grey silicified claystone (surface find) and red-slipped pottery from RJS TP I.

The archaeological materials from the Neolithic layer at Kendeng Lembu have many similarities with the assemblages from the Kalumpang sites in West Sulawesi, the latter dating from about 3500 BP (Simanjuntak et al. 2008). These similarities include handmade pottery using paddle and anvil manufacturing techniques, high everted restricted rims, red slipped surface finishing, globular body shapes, for stone tools a use of silicified raw materials, production technology using sawing, knapping and polishing, and polished rectangular cross-sectioned adzes. The close relations between both communities also appear through patterns of colonization. The up-river movements required to reach Kendeng Lembu perhaps were similar to the Austronesian colonization of West Sulawesi through the Karama valley, from Tasiu, Sikendeng and Latibung upstream to Minanga Sipakko, Kamassi and Tambing-Tambing in the upper course (Simanjuntak 2006; Bellwood 2000). Michael Pietrusewsky (2005:210) has carried out multivariate craniometric analyses to demonstrate that the late prehistoric and recent population of Java have close relations with populations in Sulawesi.

From an environmental perspective (Sunarto 1987), Kendeng Lembu is located near water sources (river, seepage and spring) which always flow in the dry season. There are abundant lithic raw material sources in the vicinity. The volcanic soils of the region have high porosity and permeability, and are stable and fertile. Kendeng Lembu and the Kali Baru Basin would have been strategic and comfortable locations for human occupation and agriculture.

In Java, a lot of proto-historic sites (c. 2000 BP) occur along the southern coast, from Jatiagung and Panggulmlati (Jember) in the east, through Meleman and Tempursari (Lumajang), Panggul (Trenggalek), Krakal (Gunung Kidul), Gunungwingko (Bantul), Wingkosigromulyo (Purworejo), to as far west as Ayamputih (Kebumen) (Nitihaminoto 2004). Now we can begin to add Neolithic distributions to the pattern.

Table 4. Archaeological finds by depth from RJS TP I.

DEPTH	LAYER	LITHICS	SHERDS	BAKED CLAY LUMPS
0-10	1	1		
10-20	1		1	
20-30	1			
30-35	2	6		
35-40	2			12
40-45	2	14		20
45-50	2	61	30 (red-slipped)	16
50-55	3	24	17	
55-60	4	16	29	
60-65	4	18	18 (red-slipped)	
65-70	4	7	0	3

ENDNOTE

In February 2009 the NSF-Arizona AMS Laboratory issued three charcoal C14 dates via the Outreach Program managed by IPPA. From RJS TP1 the result was 1332±35 bp from spit 11 (70 cm depth). From KDL TP1 two dates were obtained: 543±34 bp from spit 6 (45 cm depth) and 512±34 bp from spit 11 (70 cm depth). The KDL dates are inverted, and all appear to be from relatively recent charcoal material disturbed downwards into the sediments. The two from KDL may relate to Majapahit activity. The Kendeng Lembu Neolithic still has no certain radiometric dating.

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