Pottery From Batu Pake Gojeng Site, Sinjai, South Sulawesi

Sigit Eko Prasetyo[1*], M. Fadhlan S.I. [2], Indah Permatasarie Tjan[3], Aulia Muharini[4]

[1234]Pusat Riset Arkeometri Jalan Raya Condet Pejaten No.4 Jakarta Selatan, Indonesia
**Corresponding author. Email: sigit1105@gmail.com*

ABSTRACT
Pottery is one of the most frequently found cultural remains in archeological research, made from burnt clay. Laboratory technological analysis of pottery from this site aims to obtain accurate results on the physical properties of the pottery and to determine where to collect raw materials. Through laboratory technology analysis studies, the quality of pottery made by craftsmen in the past can be described. Based on the results of laboratory technology analysis of pottery from the site, has medium to good quality. Pottery is included in the category of daily activities tools as a container to collect water, process and serve food and drinks. From the result of the analysis, it is known that the burning rate of the pottery artifacts reaches 500-600 degree Celsius. Through mineral analysis, the pottery artifacts from the Batu Pake Gojeng site have raw materials originating from the area around the site.

***Keywords**: Pottery, laboratory analysis, physical properties, Batu Pake Gojeng site*

1. INTRODUCTION

The Batu Pake Gojeng site is an object located in Batu Pake sub-village, Biring Ere village, North Sinjai sub-district, Sinjai district, South Sulawesi province. In general, this site is a terrace step, in each terrace there are archaeological remains, ranging from megalithic buildings and findings of foreign and local ceramics (pottery).

A settlement is a place where humans carry out all kinds of activities. To survive, humans are directly or indirectly dependent on the natural and physical environment in which they live. However, in essence, the relationship between humans and their natural and physical environment is not merely manifested as a relationship of human dependence on their environment, but also manifested as a relationship where humans influence and change their environment. The natural and physical environment challenges humans to survive. In response to environmental challenges, humans create culture (Yacob 1983, in Utomo B.B. 1988; Intan, 2015). With culture, humans adapt to their environment. From the environment, food is obtained to survive, and from the environment humans can also make all kinds of equipment for their various needs. Therefore, with the increase of human civilization, the level of life and human creativity in meeting their needs will also increase. This can be seen in the findings in every archaeological research, the raw materials are made of stone, wood, and soil (Eriawati et al.1998). Pottery is one of the most common cultural remains found in archaeological research. Studies on the technological aspects of pottery have not been carried out much, so far more focused on the shape and stylistic aspects (Soegondho 1995; Intan, 2015: 47-60).

Traditional pottery is made using clay as the raw material, then fired at a certain temperature until it is considered mature. Pottery plays an important role in the lives of past communities, both in social life and in religious life (Soegondho 1995). In socio-economic life, pottery was an equipment for daily life, such as storing water, or food, as well as cooking or preserving foodstuffs. In religious life, pottery is often used as burial provisions (buril gift) or as burial containers called jar burials (Soegondho 1995; Soegondho 2000:3-10). Pottery found in archaeological research shows its variety and function, both as daily utensils and as religious utensils (Wibisono 2000:13-18; Intan, 2015:47-60).

Types of pottery for daily life include building elements, household utensils, and production tools. Building elements from pottery are ancient bricks, roof tiles, ridges, momolo, pseudo-poles, tiles, miniature houses, water pools, water tunnels, water pipes and well walls (jobong). Daily household utensils made from pottery are used to collect water (tempayan, buyung, jambangan, pasu, water basin), to process food (stoneware, cauldron lid, brazier, and furnace), to serve food and drinks (bowl, plate, teapot, and jug). Pottery

M. Hasyim (ed.), *Proceedings of the 4th International Conference on Linguistics and Culture (ICLC-4 2023)*, Advances in Social Science, Education and Humanities Research 839,
https://doi.org/10.2991/978-2-38476-251-4_46

also functions as a tool for lighting, namely the lamp (clupak). In addition, various types of figurative pottery such as miniature buildings, people, and animals are used as decoration with a variety of very dynamic expressions, for example in terms of dressing, hairstyling, wearing jewelry (Wibisono 2000:13-18; Intan, 2015:47-60).

Pottery as a means of production, although not many types but can be noted types of terracotta objects made for production needs. One of them is a metal melting pot. The shape resembles a round-bottomed cylindrical vessel, the edges are indented for pouring channels, the walls of this container are very porous, the outer wall usually has a layer of red, green, or black quartz melt as a result of high heat touch. Another type of production tool is the clay mold, which resembles a tool for duplicating certain clay figurative forms. Sometimes clay molds are used to make wax models that are related to the metal casting process (Wibisono, 2000:13-18). The use of pottery is also used for the purpose of religious rituals, namely stupika (made of clay usually not burned), the inside of the stupika there are tablets (made of clay) written with Buddhist mantras. In addition to stupika and tablets, it turns out that jugs (kundika or kamandalu) are also used in religious rituals (Wibisono 2000:13-18; Intan, 2015:47-60). In general, there are three main activities carried out to obtain ready-to-use pottery, namely, the material preparation stage, the forming stage, and the firing stage (Astiti Komang Ayu, 1999).

2. RESEARCH HISTORY

This paper discusses the findings of the 2005 excavation at the Batu Pake Gojeng Site. Laboratory technology analysis was carried out to describe the elements contained in the pottery, then compared with the soil found around the site.

The study of laboratory technology analysis of pottery has been conducted by previous researchers, for example at the Kayu Agung Site, OKI, South Sumatra (Rangkuti et al. 1993), Kolo-Kolo Site, Selayar, South Sulawesi (Intan 1996), Bayat Site, Klaten, Central Java (Eriawati et al. 1998), Gedung Karya Site, South Sumatra (Eriawati et al. 1998; Astiti 1999), Rammang-Rammang Cave Site, Maros, South Sulawesi (Intan 2002), Labo Tuo Site, Barus, North Sumatra (Sofyan et al. 2002), Karang Agung Site, Muba, South Sumatra (Intan 2003), Leran Site, Gresik, East Java (Intan 2003), Besoa Valley Megalithic Site, Central Sulawesi (Sofyan et al. 2003), and Minanga Sipakko Site, Mamuju, West Sulawesi (Intan 2011). Laboratory technology analysis of pottery can determine the quality and function of pottery made by craftsmen in the past (Intan, 2015: 47-60). Research on other prehistoric pottery in this region is still difficult to find other literature. The research in this paper is one of the analysis efforts carried out using data sources from one of the sites in South Sulawesi which is very representative to be carried out during the lack of research interest using a laboratory technology approach (Intan, 2015: 47-60).

The Batu Pake Gojeng site itself is currently used as the Batu Pake Gojeng Antiquities Park. The famous objects on this site are megalithic remains. The site consists of three steps or terraces. From the results of previous archaeological research, on the first terrace (bottom) there are findings of local ceramic fragments (plain pottery) and foreign ceramics originating from China (Ming and Ching) and Thailand (Siam and Sawankhlok). The second terrace (middle section) contained fossilized wood, altar stones, decorated stones, stamp stones, neolithic axes, beads, pottery fragments and foreign ceramics (Chinese, Thai and European). The third terrace (the uppermost part) contained a scattering of megalithic stones thought to be burials, altar stones, stone wells, stone mortar, and stone mortar (Rahman et al. 1993). Research in 2005 was conducted by the National Archaeological Research Center by describing the megalithic forms around the site, then inventorying the plants around the site, and excavating test boxes around the terrace of the site. From the results of the excavation, the most common findings were pottery fragments and a small portion of foreign ceramics (Intan, et al. 2005). The pottery fragments consist of neck, base of foot, edge, cucuk, handle, and body fragments. The results of reconstruction analysis on these fragments produce types of pottery commonly used by everyday people, such as pots, bowls, jars, pasu, and jugs.

3. PROBLEMS

Batu Pake Gojeng Sinjai is a site that has the remains of megalithic traditions. The morphology of the site in the form of terraces indicates that this site is closely related to religion. Megalithic stones found on the uppermost terrace indicate tomb buildings, stone wells, stone mortar, and altar stones. Other supporting findings on the second and third terraces in the form of foreign ceramic fragments, local ceramics, and neolithic axes, and beads indicate past community activities at this site. The mention of local ceramics in the form of pottery fragments, but it has never been scientifically tested whether it is true that the ceramics are the original product of the community around the site.

4. METHODS

The laboratory technology analysis of pottery from Batu Pake Gojeng Site, South Sulawesi, aims to obtain accurate results on the physical properties and properties of pottery, to further determine the level of pottery quality using Soegondho's assessment indicators of good or medium or bad (Soegondho, 1993). The methods applied are: 1) Sampling of pottery at the research site; 2) Selection of pottery samples based on parts of the pottery; 3) Pottery samples were analysed in the laboratory through laboratory technology analysis, namely physical analysis including water content, hardness, water absorption, porosity, specific gravity, loss of combustion (LOI), base material (clay), mixed material (sand), grain size of base material (clay), grain size of mixed material (sand), and firing rate of pottery; 4) mineralogical analysis to determine the composition of minerals and non-minerals contained by each pottery sample and; 5) determine the location of raw material collection for past pottery making through mineralogical analysis based on the similarity of minerals contained in the pottery. The classification of pottery quality can ultimately provide an idea of the level of mastery of the potter's technology and how good the level of quality of the pottery produced is. The quality of the pottery can ultimately be related to the aspect of form and the variety of activities carried out, whether the goods are for sacred or profane purposes.

5. RESULTS AND DISCUSSION

a. Pake Gojeng Batu Site

Sinjai is one of the regencies in the South Sulawesi Province which is located at 120°1'-120°20' East Longitude and 5°7'-5°20' South Latitude. The Batu Pake Gojeng site is administratively included in the Batu Pake Hamlet area of Biring Ere Village, North Sinjai Subdistrict, Sinjai Regency, South Sulawesi Province. The Batu Pake Gojeng site is listed on the Indonesian Earth Map Sheet 2110-43 (Bulupodo), and Sheet 2110-44 (Sinjai) at a scale of 1:50,000 with an altitude of 59 meters above sea level, and 40 meters above the city of Sinjai (Intan et al., 2005). The landscape (morphology) of the Batu Pake Gojeng Site is divided into a) Plain morphological unit; b) Weak undulating morphological unit and c) Strong undulating morphological unit. The Batu Pake Gojeng site is located in a weakly undulating morphological unit, with an altitude of 59 meters above sea level, and 40 meters above the city of Sinjai (Intan et al., 2005). The Batu Pake Gojeng site is located between two large rivers, the Tangka River to the north, and the Sinjai River to the south (Intan et al., 2005). The Batu Pake Gojeng site and its surroundings are composed of conglomerate, tuff, volcanic breccia, agglomerate, and alluvial rocks. The Batu Pake Gojeng site itself is in tuff rocks of Late Miocene to Pliocene age (N18-N20) (Intan et al., 2005). The geological structure of the Batu Pake Gojeng Site, generally located in the west of the site, is a normal fault and strike slip fault. So, it can be said that the Batu Pake Gojeng Site area is free from geological structural disturbances (Intan et al., 2005).

Figure 1. Tuff rocks (Late Miocene-Pliocene) exposed at the Batu Pake Gojeng Site

Figure 2. Volcanic breccia rocks (Pleistocene) exposed at the Batu Pake Gojeng Site

Figure 3. The Tangka River is in the north of the site and flows from west to east and empties into Bay B

1. Sample Analysis

For the laboratory analysis, several samples were required. Sampling of the pottery is done in the test box (tespit) and samples of clay and sand in certain locations, namely:

a. Pottery samples, pottery sampling locations for the analysis of burnt clay laboratory technology, conducted in the test box (tespit) BPGJ/TP1/05. Sampling of pottery in the BPGJ/TP1/05 test box, in spit-1 (0-50 cm) in the form of black and brown plain body fragments. In spit-2 (50-150 cm) in the form of black and brown plain body fragments.
b. Mineralogical analysis samples in the form of clay and sand, the location of clay sampling is a rice field area, and the location of the sand sample is taken from a small river called Cenning River. The location of the clay and sand samples is located at 05°07'10" N and 120°14'37" East. In addition to the samples mentioned above, samples were also taken from pottery craftsmen, in the form of clay samples, sand samples, and dough samples.

Figure 4. Pottery Fragments from test box BPGJ-TP1-05

The physical appearance of the four samples is as follows; a) Sample-1 pottery from TP1/spit1/0-50cm, black color, compact, smooth, no visible pores, visible iron oxide; b) Sample-2 pottery from TP1/spit1/0-50cm, brown color, compact, smooth, visible fine pores and iron oxide; c) Sample-3 pottery from TP1/spit2/50-150cm, black color, compact, smooth, no visible pores, visible oxides and; d) Sample-4 pottery from TP1/spit2/50-150cm, brown color, compact, smooth, visible fine pores and iron oxides (Intan et al., 2005).

Sediment samples (clay and sand) and pottery samples that have been crushed, washed to remove the clay content using a sieve measuring Mesh no. 325 (0.045 mm). Furthermore, the minerals produced were dried in an open dryer at a temperature of 100 ° Celsius, after the minerals were dry, then observed under a binocular microscope which aims to determine the types of minerals and non-minerals from sediment samples (clays and sands) and in pottery samples (Intan et al., 2005).

b. *Results of Laboratory Analysis*

a. Laboratory Technology Analysis of Burnt Clay

The results of the laboratory analysis of pottery from the Batu Pake Gojeng Site, using the physical analysis method (Table-1) are as follows:

Sample-1: In the form of body fragments, dark gray in color (4/1-7.5YR), sample weight 3.6 grams, thickness 4.95-10.33 mm, with hardness 3-4 on the Mohs scale. Water content 2.77%, specific gravity 2.50, LOI (lost og ignation) 9.09%, with porosity 26.31% and water absorption 12.50%. The composition of the main raw material (clay) is 33.34%, additional raw material (sand) is 66.66%, with clay grain size 0.0208-0.0256 mm and sand grain size 0.2500-0.5000 mm. The mineral composition is quartz, hornblende, plagioclase, pyroxine, iron oxide, clay, while the non-mineral composition is rock fragments. The firing rate of the pottery is 500°-600° Celsius.

Sample-2: In the form of body fragments, light brown in color (6/4-7.5YR), sample weight 6.9 grams, thickness 3.5-6.58 mm, with hardness 3-4 on the Mohs scale. Water content 2.00%, specific gravity 2.45, LOI (lost og ignation) 9.67%, with porosity 33.33% and water absorption 16.94%. Composition of the main raw material (clay) 50%, additional raw material (sand) 50%, with clay grain size 0.0208-0.0256 mm and sand grain size 0.2500-0.5000 mm. The mineral composition is quartz, hornblende, plagioclase, pyroxine, iron oxide, clay, while the non-mineral composition is rock fragments. The firing rate of the pottery is 500°- 600° Celsius.

Sample-3: In the form of body fragments, dark gray in color (4/1-7.5YR), sample weight 3.6 grams, thickness 4.7-8.8 mm, with hardness 3-4 on the Mohs scale. Water content is 4.34%, specific gravity is 2.44, LOI (lost og ignation) is 6.25%, with porosity of 27.02% and water absorption of 13.15%. The composition of the main raw material (clay) is 43.75%, the auxiliary raw material (sand) is 56.25%, with clay grain size 0.0208-0.0256 mm and sand grain size 0.2500-0.5000 mm. The mineral composition is quartz, hornblende, plagioclase, pyroxine, iron oxide, clay, while the non-mineral composition is rock fragments. The firing rate of the pottery is 500°-600° Celsius.

Sample-4: In the form of body fragments, light brown in color (6/4-7.5YR), sample weight 4.1 grams, thickness 4.33-8.59 mm, with hardness 3-4 on the Mohs scale. Water content 2.43%, specific gravity 2.50, LOI (lost og ignation) 9.67%, with porosity 36.00% and water absorption 18.36%. Composition of the main raw material (clay) 50%, additional raw material (sand) 50%, with clay grain size 0.0208-0.0256 mm and sand grain size 0.2500-0.5000 mm. The mineral composition is quartz, hornblende, plagioclase, pyroxine, iron oxide, clay, while the non-mineral composition is rock fragments. The firing rate of the pottery is 500°- 600° Celsius.

Table 1. Results of Analysis of Physical Properties of Pottery from the Batu Pake Gojeng Site

	Sampel-1	**Sampel-2**	**Sampel-3**	**Sampel-4**
Fragment sample	Body	Body	Body	Body
Sample color	Dark gray (4/1-7,5YR)	Light brown (6/4-7,5YR)	Dark gray (4/1-7,5YR)	Light brown (6/4-7,5YR)
Weight (gram)	3,6	5,0	6,9	4,1
Thickness (mm)	4,7-8,8	3,5-6,58	4,95-10,33	4,33-8,59
Hardness (Mohs Scale)	3-4	3-4	3-4	3-4
Density (gr/cm³)	2,50	2,45	2,44	2,50
Water content (%)	2,77	2,00	4,34	2,43
LOI (%)	9,09	9,67	6,25	9,67

Porosity (%)	26,31	33,33	27,02	36,00
Water absorption (%)	12,50	16,94	13,15	18,36
material compositi on (%): Main Materials (clay) Mixed materials (sand)	33,34 66,66	50 50	43,75 56,25	50 50
Grain size (mm): Main Materials (clay) Mixed materials (sand)	0,0208 - 0,0256 0,2500 - 0,5000	0,0208-0,0256 0,2500-0,5000	0,0208-0,0256 0,2500-0,5000	0,0208-0,0256 0,2500-0,5000
material compositi on: Minerals Non minerals	Quartz, hornblende, plagioclase, peroxins, iron oxide, clay Rock fragments	Quartz, hornblende, plagioclase, peroxins, iron oxide, clay Rock fragments	Quartz, hornblende, plagioclase, peroxins, iron oxide, clay Rock fragments	Quartz, hornblende, plagioclase, peroxins, iron oxide, clay Rock fragments
Burning rate (°C)	500-600	500-600	500-600	500-600

Description
Sample No.1: TP1/spit1/0-50cm (black)
Sample No.2: TP1/spit1/0-50cm (brown)
Sample No.3: TP1/spit2/50-150cm (black)
Sample No.4: TP1/spit2/50-150cm (brown)

b. *Mineralogical Analysis*

The mineralogical analysis of the pottery samples and sediment (clay and sand) samples (taken both from the site and from the craftsmen), has yielded the following data:

1. Mineralogical Analysis of Sediments

The results of mineralogical analysis of several sediment samples (clay and sand) (Table-2) are as follows:

Sample of paddy field clay (sediment sample 1), located in Dusun Cening, Kel. Biring Ere, Kec. Sinjai Utara, or at 05°07'10" LS and 120°14'37" BT. The mineral composition is quartz, plagioclase, hornblende, pyroxene, iron oxide, and clay, while the composition of non-minerals was not found (Kraus et.al., 1959; Ong et al., 1981).

Sand samples from the Cenning River (sediment sample 2), located in Cening Hamlet, Biring Ere, North Sinjai Subdistrict, or at 05°07'10" N and 120°14'37" East. The mineral composition is quartz, plagioclase, pyroxene, hornblende, iron oxide, and clay, while the non-mineral composition is igneous rock fragments, and sedimentary rock fragments (Kraus et.al., 1959; Ong et al., 1981).

Sample Artisan clay (sediment sample 3), located in Dusun Cening, Kel. Biring Ere, Kec. Sinjai Utara. The mineral composition of quartz, plagioclase, pyroxene, hornblende, iron oxide, and clay, while the non-mineral composition is igneous rock fragments, and sedimentary rock fragments (Kraus et.al., 1959; Ong et al., 1981).

Artisan sand sample (sediment sample 4), located in Cening Hamlet, Kel. Biring Ere, Kec. Sinjai Utara. The mineral composition of quartz, plagioclase, hornblende, pyroxine, iron oxide, and clay, while the composition of non-minerals was not found (Kraus et.al., 1959; Ong et al., 1981).

Artisans slip sample (sediment sample 5), located in Cening Hamlet, Kel. Biring Ere, Kec. Sinjai Utara. The mineral composition is quartz, plagioclase, pyroxene, hornblende, iron oxide, and clay, while the non-mineral composition is igneous rock fragments, and sedimentary rock fragments (Kraus et.al., 1959; Ong et al., 1981).

Figure 5. Sampling clay as the main raw material in Cening Hamlet

Table 2. Mineral and non-mineral elements contained in sediment samples.

Mineral	**Sediment-1**	**Sediment-2**	**Sediment-3**	**Sediment-4**	**Sediment-5**
Quarzt	√	√	√	√	√
Hornblende	√	√	√	√	√
plagioclase	√	√	√	√	√
Peroxin	√	√	√	√	√

Clay	√	√	√	√	√
Iron Oxide	×	√	√	×	√
Non-Mineral	**Sediment-1**	**Sediment-2**	**Sediment-3**	**Sediment-4**	**Sediment-5**
Fragments of igneous rock	×	√	√	×	√
Fragments of sedimentary rocks	×	√	√	×	√

Description
Sediment sample 1: Rice field clay
Sediment sample 2: River sand
Sediment sample 3: Artisan clay
Sediment sample 4: Artisan sand
Sediment sample 5: Artisan slip

2. Mineralogical Analysis of Pottery

The results of the mineralogical analysis of several pottery samples (Table-3) are as follows:

Sample-1: pottery from TP1/spit1/0-50cm is brown in color, with mineral composition of quartz, plagioclase, hornblende, pyroxene, iron oxide, and clay, while the non-mineral composition is rock fragments (Kraus et.al., 1959; Ong et al., 1981).

Sample-2: pottery derived from TP1/spit1/0-50cm is brown in color, with mineral composition of quartz, plagioclase, hornblende, pyroxene, iron oxide, and clay, while the non-mineral composition is rock fragments (Kraus et.al., 1959; Ong et al., 1981).

Sample-3: pottery derived from TP1/spit2/50-150cm is black in color, with mineral compositions of quartz, plagioclase, hornblende, pyroxene, iron oxide, and clay, while the non-mineral compositions are rock fragments (Kraus et.al., 1959; Ong et al., 1981).

Sample-4: pottery from TP1/spit2/50-150cm is brown in color, with mineral compositions of quartz, plagioclase, hornblende, pyroxene, iron oxide, and clay, while the non-mineral composition is rock fragments (Kraus et.al., 1959; Ong et al., 1981).

Table 3. *Mineralogical analysis results of several pottery samples*

Minerals	**Sample-1**	**Sample-2**	**Sample-3**	**Sample-4**
Kuarsa	√	√	√	√
Hornblende	√	√	√	√
Plagioclase	√	√	√	√
Peroxin	√	√	√	√
Clay	√	√	√	√
Iron Oxyde	√	√	√	√
Non-Minerals	**Sample-1**	**Sample-2**	**Sample-3**	**Sample-4**
Rock fragments	√	√	√	√

Description
Sample No.1: TP1/spit1/0-50cm (black)
Sample No.2: TP1/spit1/0-50cm (brown)
Sample No.3: TP1/spit2/50-150cm (black)
Sample No.4: TP1/spit2/50-150cm (brown)

From the physical analysis of the pottery, the following data were obtained, the hardness of the pottery is 3-4 Mohs Scale, with a specific gravity of 2.44-2.50 and porosity of 26.31%-36.00% and water absorption of 12.50%-18.36%, moisture content of 2.00%-4.34% and log of ignation (LOI) of 6.25%-9.67%. Comparison of the composition of pottery raw materials, namely the main raw material (clay) 33.34%-50%, while additional raw materials (sand) 50%-66.66%. Clay as the main raw material has a grain size between 0.0208 mm and 0.0256 mm, while sand has a grain size between 0.2500 mm and 0.5000 mm. The mineral composition of each pottery fragment is generally quartz, plagioclase, hornblende, pyroxene, iron oxide and clay, while the non-mineral composition is rock fragments. The firing rate of pottery reaches 500°-600° Celsius, which is burned in the open air (open air baked). Pottery from the Batu Pake Gojeng Site analyzed is light in color, which is due to the content of quartz minerals, and plagioclase in the raw materials (Ong H.L. et al., 1981; Pettijohn P.J. 1975).

3. Location of Pottery Raw Material Sources

In determining the location of raw material sources for burnt clay artifacts, what must be considered is a supportive environment (availability of water, clay, and sand). This is also applied to research at the Batu Pake Gojeng Site, where the three aspects of the environment are also found on this site.

From the mineral similarities found in both the four pottery samples and the sediment samples (clay and sand), it turns out that there are similarities, meaning that the minerals contained in the pottery (except iron oxide) are found in the rice field clay (the location of the raw material collection), while the iron oxide that is not found in the pottery, apparently comes from the sand sediment sample located in the Cenning River. With mineralogical analysis, it has been proven that the pottery used by the community supporting the Batu Pake Gojeng Site, the raw material comes from around the site area.

4. Pottery Quality

Based on the results of the laboratory analysis of fired clay (physical method), it can be explained about the quality of the pottery found during research activities at the Batu Pake Gojeng Site, using the reference proposed by Soegondho (1993: 337) (Table-4).

Table 4. Reference to Determine the Quality of Plawangan and Gilimanuk Pottery

Measurement	Poor quality	Medium quality	Good quality
Density	1 – 1,90 g/cm3	2 - 3,5 g/cm3	> 3,5 g/cm3
Hardness	< 3 Mohs	3-3,5 Mohs	> 3,5 Mohs
Porosity	> 50 %	40-50 %	< 40 %
Source: Soegondho, 1993:337			

Pottery Sample-1: from TP1/spit1/0-50cm is black in color, has a hardness of 3-4 on the Mohs scale, a specific gravity of 2.50 and a porosity of 26.31%, which when compared with the reference from Santoso (1993:337), the quality of pottery sample-1 is included in:

- Medium quality, based on specific gravity (2.50 g/cm3)
- Good quality, based on porosity (26.31%)
- Medium-good quality, based on hardness (3-4 Mohs scale)

Pottery Sample-2: from TP1/spit1/0-50cm is brown in color, has a hardness of 3-4 Mohs scale, specific gravity of 2.45 and porosity of 33.33%, which when compared with the reference from Santoso (1993:337), the quality of pottery sample-2 is included in:

- Medium quality, based on specific gravity (2.45 g/cm3)
- Good quality, based on porosity (33.33%)
- Medium-good quality, based on hardness (3-4 Mohs scale)

Pottery Sample-3: from TP1/spit2/50-150cm is black in color, has a hardness of 3-4 Mohs scale, specific gravity of 2.44 and porosity of 27.02%, which when compared with the reference from Santoso (1993:337), the quality of pottery sample-3 is included in:

- Medium quality, based on specific gravity (2.44 g/cm3)
- Good quality, based on porosity (27.02%)
- Medium-good quality, based on hardness (3-4 Mohs scale)

Pottery Sample-4: from TP1/spit2/50-150cm is brown in color, has a hardness of 3-4 Mohs scale, specific gravity of 2.50 and porosity of 36.00%, which when compared to the reference from Santoso (1993:337), the pottery quality of sample-4 is included in:

- Medium quality, based on specific gravity (2.50 g/cm3)
- Good quality, based on porosity (36.00%) Medium-good quality, based on hardness (3-4 Mohs scale)

6. CONCLUSION

From the results of the laboratory technology analysis of pottery from the Batu Pake Gojeng Site, it can be concluded that the pottery has medium to good quality and is categorized into everyday utensils that function to hold water (tempayan, buyung, jambangan, pasu, water tubs), to process food (pots, cauldrons, braziers, and stoves), to serve food and drinks (bowls, plates, and jugs). The firing rate of pottery reaches 500°-600° Celsius, which is burned in the open air (open air baked). The pottery from the Batu Pake Gojeng Site is light in color, which is due to the mineral content of quartz, and plagioclase in the raw materials. This is in accordance with the general typology carried out previously regarding the form of pottery.

The mineral analysis results of the pottery and sediment samples (clay and sand) were found to be similar, meaning that the minerals contained in the pottery (except iron oxide) were found in the paddy field clay (the location of the raw material collection), while the iron oxide that was not found in the pottery, apparently came from the sand sediment samples located in the Cenning River. The community supporting the site may already have expertise in making utensils made of pottery.

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