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**ARCHAEOLOGICAL  
IMPACT ASSESSMENT PROJECT  
In Pampanga and Tarlac**

**by**

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## I. INTRODUCTION

Environmental impact assessment has been recognized as an important component of infrastructure development. The purposes are to incorporate environmental considerations into the feasibility analysis of the proposed project and to prepare a detailed environmental assessment of its impacts conforming to the regulations and procedures of the Philippine government. One aspect of the environmental impact assessment is the archaeological-historical survey. Several proposed infrastructure projects in the Philippines (Dizon et al 1991, Dizon et al 1993, Cuevas & Bautista 1991) incorporated the archaeological assessment of areas to be affected by the development and resulted in the identification of areas with great archaeological potentials.

On June 12, 1991, after 611 years of dormancy, Mount Pinatubo erupted, resulting in what has been described as the biggest volcanic event of the century. The series of eruptions and subsequent lahar flows have changed the landscape and the lives of the people of Pampanga, Tarlac and Zambales. Several towns, villages and settlements were buried under the pyroclastic materials including volcanic ash and lahar. Infrastructure, such as flood control systems, roads and bridges were also destroyed.

Due to the continuing threat of lahar and flooding in the provinces of Pampanga, Tarlac and Zambales, the United States Agency for International Development (USAID) in an effort to help the Philippine government, is financing a comprehensive study, entitled the Mount Pinatubo Recovery Action Plan (RAP) which is being conducted by the U.S. Army Corps of Engineers (USACE). To address the long-term crisis created by the eruption of the Mount Pinatubo, the RAP will evaluate existing pyroclastic deposits, assess the risks of future sedimentation, floods and lahars, and to develop recommendations for possible engineering alternatives for the eight river basins draining from Mount Pinatubo. Louis Berger International, Inc. (LBII), a consulting firm was subcontracted by the USACE to provide on-site liaison services and specified technical support, including the project component for conducting environmental assessment studies.

On May 8, 1993, a team from the Archaeology Division of the Philippine's National Museum was requested to participate in the archaeological impact assessment by MR. MELCHOR AGUILERA, JR., Cultural Resources Specialist of LBII Environmental team. This archaeological impact assessment is concentrated in the areas that could be affected by the potential intervention measures to be undertaken by the USACE.

Following the study priorities of the Recovery Action Plan, the initial archaeological survey was conducted from May 10 to 21, 1993 along the five eastern river basins which drain Mount Pinatubo.

The primary purpose of this fieldwork is to identify archaeological sites in the above-mentioned areas with the following specific objectives:

1. To conduct a literature survey of the recorded prehistoric sites within each of the five eastern river basins;
2. To conduct an archaeological survey of the identified sites;
3. To identify the archaeological materials;
4. To assess the area in relation to the potential intervention measures; and
5. To present recommendations based on the results of the archaeological survey.

The purpose of this report is to present the results of this initial archaeological impact assessment.

## II. THE SETTING

Region III or the Central Luzon, is also known as the "Central Plains" and the "Rice Granary of the Philippines". The region is composed of six provinces. Two of these provinces are Pampanga and Tarlac. Pampanga lies north of Manila, bounded by Tarlac and Nueva Ecija on the north and northeast, the Manila Bay on the south, Zambales and Bataan on the west and Bulacan on the east. On the other hand, Tarlac lies north of Pampanga and bounded on the north by Pangasinan, Nueva Ecija on the east, Pampanga on the south, and Zambales on the west (Figure 1).

Pampanga has a total land area of 2,180.70 square kilometers and the topography is characterized by low plains with a narrow strip of elevated land along the western border. The province contains three separate regions. The first region is the mountainous Zambales range that includes the Mount Pinatubo on the western border and isolated Mount Arayat in the northeast side. The indigenous cultural community occupying the mountains around Mount Pinatubo are the Aetas. The second region is heavily watered by the Rio Grande de la Pampanga and its estuaries. The third region is the flat expanse constituting the Pampangan extension of the "Central Plain of Luzon " and includes land suitable for the growing of rice (*Oryza sativa*) and sugar (*Saccharum officinale*). Prior to the extensive conversion of the Pampanga delta area to Aquaculture, nipa (*Nipa fruticans*) and mangrove (*RHIZOPHORACEAE*) swamps, were common, mostly in the southern portion of the delta area bordering Manila Bay.

Tarlac, popularly known as the "melting pot of Luzon" occupies the northwestern part of the central plain of Luzon. Extensive plains characterize the northern, eastern and southeastern sections of the province while hills and mountains comprising the eastern side of the Zambales mountain range make up the western and northwestern sections. With an area of 3,053.4 square kilometers, the province constitutes barely one percent of the total land area of the country.

The drainage system of Central Luzon is dominated by the southward flowing Pampanga River, which originates in the low Caraballo Mountains to the north and continues through the lowlying plains of northeastern Nueva Ecija. The Pampanga River is joined by several freshwater tributaries, including the Chico Pampanga and Lubao Rivers, prior to entering the brackish Pampanga delta area adjoining Manila Bay.

The province of Pampanga is composed of 21 municipalities and one city with a total of 535 barangays. The livelihood in the said places are agriculture, aquaculture and livestock (Pampanga Provincial Profile, 1992).

The province of Tarlac has eighteen (18) municipalities with a total of 509 barangays. The city of Tarlac is the capital of the province and the center of commercial activities. The residents of the province speak several languages, namely; Tagalog, Pangasinense, Ilocano and Pampango.

The following is the list of the five river basins visited and the team's observations of the on-going engineering activities:

1. Abacan River - Several structures were already built in this river such as the gabions located on the North Expressway Bridge and the low sabo structures on the bridge at Barangay Anunas. There were massive earth moving activities (channel excavations) at the upper and middle reaches of this river. Reinforcement of the existing levees to certain points of the two bridges was observed.
2. Pasig-Potrero River - There were extensive earth moving activities (channel excavations) on this river from Barangay Mancatian, Porac to Barangay Santa Catalina, Minalin. No activities for the reinforcement or stabilization of the levee slopes was observed.
3. Porac-Gumain River - Activities observed were the riprapping of the levee slopes and the application of soil materials on the surface for revegetation to stabilize the levee. These engineering activities can be observed at the Santa Cruz Bridge along the Gapan-Olongapo Road. The cobbles, rubbles and boulders used for riprapping of the levees of the five river systems were being gathered and hauled from the upper Porac area.
4. Bamban-Sacobia River - A new levee has been built at Barangay Dolores, Mabalacat which was being reinforced by riprapping and concreting of the inner levee slopes. Revegetation, by planting grasses is being undertaken on the outer side of the levee. Similar engineering activities were being conducted near the San Francisco Bridge which provides access to Concepcion, Tarlac. Massive earth moving activities were also observed along the upper and lower reaches of this river.

5. O'Donnell River - There was not much engineering activity observed going on along this river. However, there were previously constructed levees at Barangays Santa Juliana and O'Donnell to prevent lahar from spreading towards these populated areas.

### **III. BRIEF HISTORICAL BACKGROUND OF PAMPANGA AND TARLAC**

#### **Pampanga**

The word Pampanga was coined by the early Spanish conquerors from "Pangpang" or "Pangpangan", which in local language means, river bank. Pampanga was the first Luzon province inaugurated by the Spaniards in the same year as the City of Manila in 1571. The province of Pampanga was then called the most beautiful and the richest in the Philippines. In June 7, 1576, Governor General Francisco de Sande described Pampanga as a profitable area to settle because it produces the most rice as compared to other islands of the Philippines. In 1585, Bishop Domingo de Salazar described that the province of Pampanga then had a total of 22,000 taxpayers with 18 priests. Travels and migration from south to north of Pampanga and vice versa were made through Rio Grande or the Pampanga River.

There were three revolts in Pampanga which were kindled by racial discrimination and social injustices on the part of the Spanish government on 1585, 1645 and 1660. The 1585 revolt was made by the Pampangos and the Tagalogs against abuses of slave-owners while the great rebellion of 1645 was due to the injustices committed in the collection of tributes. The October 10, 1660 rebellion was led by Francisco Maniago of Mexico, Pampanga and Agustin Pamintuan of Apalit, the motive was due to forcible employment of Pampangos in the cutting of timbers for Spanish galleons and failures of the government to pay for the large amounts of rice collected in Pampanga for the use of royal officials.

As late as December 31, 1841, Pampanga was politically divided into Upper Pampanga and Lower Pampanga. Upper Pampanga was comprised of the following towns; Angeles, Cabiao, Capas, Gapan, La Paz, Mabalacat, Magalang, Porac, San Isidro, San Miguel de Mayumu, Santa Rita and Tarlac, while the Lower Pampanga was comprised of the following towns; Apalit, Arayat, Bacolor, Betis, Candaba, Guagua, Lubao, Macabebe, Mexico, Minalin, San Fernando, San Luis, San Simon, Santa Ana, Santo Tomas and Sexmoan. In 1852, the towns of Cabiao, Gapang, San Isidro were ceded to Nueva Ecija and in 1860, Pampanga again lost portion of its territories, namely; Bamban, Capas, Concepcion, Victoria, Tarlac, Mabalacat, Magalang, Porac, and Floridablanca. Later in 1873, Mabalacat, Magalang, Porac and Floridablanca were returned to Pampanga.

The insurrection against Spanish sovereignty broke out in Pampanga on June 3, 1898 with the "Voluntarios Locales de Bacolor" spearheading the revolt under the command of Felix Galura and Paulino Lirag. The Filipino-American hostilities began on February 4, 1899 and Pampanga, together with Bataan and Bulacan became the Fifth Military

District of Northern Luzon under the command of General Frederick Dent Grant with the town of San Fernando as the headquarters. On April 16, 1904, the local U.S. Army established a big military headquarter covering two Barrios, namely; Manga and Sapangbato, named Fort Stotsenburg. Fort Stotsenburg was later on named Clark Air Base after the Japanese occupation.

The Japanese hostilities in the Philippines started on December 8, 1941 with the Japanese Air Force bombing Clark Field and Fort Stotsenburg killing many soldiers and civilians. Fort Stotsenburg and Clark Field were captured by the Japanese troops on December 31, 1941. On April 9, 1942, 10,000 Americans and around 60,000 Filipino soldiers surrendered to the troops of Imperial Japanese Army under the command of Lt. General Homma. On April 14 to 24, 1942, about 57,000 Filipino and American surrendered soldiers were forced to join the "Death March" from Mariveles, Bataan passing through San Fernando, Pampanga on the way to the concentration camp at O'Donnell, Capas in the province Tarlac. An estimated 10,000 marchers composed of Filipino and Americans died on the way to Camp O'Donnell and 25,000 died later of starvation and disease while being detained at the said concentration camp. On January 28, 1945, Clark Field and Fort Stotsenburg were retaken from the Japanese troops by the combined American and Filipino soldiers and this event started the liberation of Pampanga and other neighboring provinces from the Japanese occupation.

## **Tarlac**

The name Tarlac was derived from "Malatarlak", an Aeta term for a weed that abounds in the hinterlands of the area. The province of Tarlac was formerly part of Pampanga. In 1874, Tarlac province was created with the following towns ceded from Pampanga; Bamban, Capas, Concepcion, Tarlac, Victoria, La Paz, Patling (now O'Donnell). Additional towns ceded from southern Pangasinan were included and these are Camiling, Paniqui, Anao and Gerona. Prior to its creation as a province, Tarlac was governed as a Commandancia-Militar in 1860 under "Commandante" Cecilio Lopez de Cerain because of the warlike tribes, the Aetas and the bandits that were common on the area. The transformation of Tarlac from a politico-military government occurred in the years 1885 to 1886.

Tarlac was one of the first provinces to rise up in arms against the Spaniards. In 1895, a chapter of the Katipunan society was secretly established in Tarlac headed by Francisco S. Makabulos. The Katipunan society became open on January 24, 1897, when Makabulos and his men proclaimed the revolution in Tarlac with what is now known as the First Cry of Tarlac. On April 17, 1898, Makabulos established a provisional revolutionary government which included the provinces of Pangasinan, Nueva Ecija, La Union and Zambales. The Makabulos government ceased to exist when Emilio Aguinaldo established a dictatorial government in May 24, 1898. The surrender of the Spanish garrison of Tarlac to the revolutionary forces in July 10, 1898 led to the proclamation of Tarlac as the seat of the revolutionary government, with La Paz as the capital. During American occupation, Tarlac province became the seat of the Revolutionary Congress

of Aguinaldo starting June 6, 1899 and the town of Bamban was the capital of the Philippine Republic. Tarlac was the site of many battles and on November 12, 1899, Tarlac fell to the Americans. After the fall of Tarlac, Emilio Aguinaldo transferred the seat of the revolutionary government from Bamban to Bayambang, Pangasinan.

On December 8, 1941, the Pacific War broke out and the Fall of Bataan on April 9, 1942, made the province of Tarlac historically significant with the infamous "Death March". A total of 10,000 Filipino and American soldiers died during the march from Mariveles, Bataan to the concentration camp in O'Donnell, Capas in the province of Tarlac. A total of 25,000 combined Filipino-American soldiers died later of starvation and disease while at Camp O'Donnell.

#### **IV. RECORDED ARCHAEOLOGICAL RESOURCES OF PAMPANGA AND TARLAC**

In Porac, Pampanga, Beyer (1947) reported that Hacienda Ramona has a remarkable and extensive "Porcelain Age" site of the early type, known as "Goodall Site". A large quantity of burial jars and smaller ceramic pieces of various shapes and sizes was obtained. Based on Beyer's study, there were at least three periods of habitation that are identifiable, namely :

1. An extensive burial area dating from Late Tang to Middle Sung (9th to 12th centuries A.D.), mostly with plain glazed-burial jars;
2. A village site and less extensive burial area, dating chiefly to Late Sung and Yuan (13th to 14th centuries A.D.), with early dragon jars and similar objects; and
3. A small village site and possibly a few graves, dating from the beginning of the Ming Period (14th to 15th centuries A.D.).

In addition, the Hacienda Ramona presents certain features of special interest for ceramic study and interpretation. These are the following:

1. The presence of large quantities of Yuchow and other Southern Sung wares;
2. Several good examples of the rare Tobi-suyi or spotted celadon, associated with Ying Ching fragments, one whole piece being the form of an unusually well-made carabao (the glaze between the spots being a delicate translucent blue-green is typically Ying-Ching).
3. Some probable Tang black-glazed and apple-green glazed pieces and fragments which closely resemble the Kalong ware of Northern Siam (Thailand).

In the municipality of Lubao, Beyer (1947) also mentioned that a site was discovered when a well was dug. The materials included a medium large, Tzechow type of

black-white decorated jar or vase and other pieces attributed to the Sung and Ming Dynasty periods.

In 1960, Fox conducted an archaeological excavation at Balukbuk, Dolores (Ramona), municipality of Porac. This is situated southwest of the Hacienda proper on the property of MR. MARCIANO DIZON. The archaeological work revealed the presence of habitation and burial sites. The habitation site contained typical refuse such as hundreds of broken pottery sherds of both locally made earthenware and imported porcelain and stonewares, broken metal tools, animal bones and teeth. The lowest layer of the midden contained ceramic materials dating to the 10th century A.D., Sung and Yuan from the 10th to 14th centuries and finally blue and white sherds of the Ming period and of the 15th century, the latter forming the uppermost strata. Based on this archaeological evidences, it suggest a large pre-Spanish community inhabited the high points at Balukbuk which overlook the valley.

With regards to the burial site, a large stoneware jar was found covered with inverted monochrome plate and contained bones of a child and two iron bracelets. The date was probably of the Yuan period, in the 14th century A.D.

In Gubat, Dolores, in the municipality of Porac, archaeological excavations by Fox (1960) also resulted in the discovery of an extensive habitation and burial area which dated wholly from the earlier Sung and Yuan Periods, covering from the late 11th century to the late 14th century. Above the Gubat Site, cut and decorated boulders were found. Fox believed that these stone structures appeared to form an exposure platform used in decomposing bodies prior to the secondary jar burial practice. A whole stone chisel was excavated near a boulder which probably date the quarrying. Archaeological work in this area revealed that the major reason for the location of the large pre-Spanish community is water, the finest spring in the area being only few hundred yards from the site. According to Fox, Gubat is the oldest site in the upper Porac area as indicated by the porcelain and stoneware sherds and was abandoned in the 14th century.

In Tarlac Province, there was an scarcity of data with regards to recorded archaeological resources. To date, no systematic archaeological work has been done in the province of Tarlac despite of the reported findings of cultural materials in the following municipalities;

1. Palimbo, Camiling - Stone adzes associated with pottery sherds
2. Tarlac, Tarlac - Olive green plate with two-fish design in relief on the center, used as cover for a jar
3. Hacienda Bagong Buhay, Camiling, Moncada & Paniqui - blue and white ceramics

## V. METHODOLOGY

Archaeological data in the Records Section of the Archaeology Division, National Museum were gathered in order to guide the researchers in the archaeological survey of areas along the freshwater tributaries which will be affected by lahar with the onslaught of the rainy season. Topographic maps from the National Mapping and Resource Information Authority (NAMRIA), Department of Environment and Natural Resources, with 1:50,000 scale were carefully studied. These maps included the following:

Code no.	Description
7172 IV	Guagua
7173 IV	Tarlac
7173 III	Angeles
7073 II	Abacan

These maps were modified by marking with color codes the areas affected by lahar. The modification was made on uncontrolled photo-mosaic of the Mount Pinatubo affected areas with 1:20,000 scale. This was prepared by the Cartographic Operations Division, Bureau of Soils and Water Management from the aerial photograph scale 1:15,000 taken from August to November 1991 by CERTEZA for NAMRIA. The above-mentioned maps, Brunton compasses and two-way radio system were used to facilitate the archaeological survey specifically along the river systems where infrastructure development are being done. The team drove through the five river basins using a hired jeepney and conducted a walk-in survey at random inside and outside of the vicinity of the five rivers.

The team aided with an archaeological field kit conducted several interviews with the local residents near the river basins covered by the survey. The purpose of the interviews was to determine if there were surface materials with archaeological significance found on the river basins and within its immediate vicinities prior to the deposition of lahar or ash falls. The archaeological field kit was composed of samples of archaeological materials representing different cultural periods of tradeware ceramics (shards), stone implements and earthenware materials. The archaeological field kit provided a good reference of cultural materials that the local residents could easily identify. There were guides/laborers that were hired locally for the archaeological survey that provided the team with the background informations on the physical setting of the five river basins prior to the Mount Pinatubo eruption. The information gathered from the local residents and the guides/laborers provided insights of the former environmental setting of the project areas which were considered vital in the assessment of potential archaeological resources.

Archaeological surveys in the higher elevation near the infrastructure development areas were also conducted in order to verify the presence of archaeological materials. Walk-in-surveys were performed in the newly cultivated farms of:

1. Cangatba, Porac (Pampanga)
2. Balukbuk, Porac
3. Sapang Wak, Porac
4. Maniknik, Dolores, Porac
5. Sta. Rosario, Mexico (Pampanga)
6. Sta. Juliana, Capas (Tarlac)
7. O'Donnell, Capas (Tarlac)

In the conduct of the archaeological surveys, the team was grouped into two with each group provided with the two-way radio system. Reference points were first established (e.g. roads, trees, posts, etc.) and served as the starting points for the walk-in surveys. Exposed ground surface were scanned for possible presence of archaeological materials or historical landmarks. Test pit excavations were conducted in areas where surface archaeological materials were found as in the case of Barangay Cangatba in Porac. Attentions were given to eroded portions of the areas surveyed because these exposed features could provide informations on the depositional history of the sites. The coverage of the walk-in survey was based on the following factors; topography, vegetation, extent of surface distribution of cultural materials and extent of lahar or ash fall deposits. The reference bearings of each site were determined with the use of a Brunton Compass, and with the use of the topographic map, the site was then located and marked.

The activities of the team were documented through recording, video-documentation and photography.

National Museum Archaeological Survey Form (see sample form) was used to gather relevant information regarding the discovered archaeological site. Official codes of the NM were used for each site (Peralta, 1981). All archaeological materials were cleaned with the use of a brush and water and allowed to dry in shade. These materials were then packed with the bagging slip, placed inside the plastic bag of appropriate size and recorded on the Specimen Inventory Form.

## **VI. RESULTS**

### **Archaeology**

The initial assessment of the project areas was made based on the maps and aerial photo-interpretation as well as field observations. As an initial observation, the five river basins potentially provided an ideal setting for cultural activities because of traditional pattern of habitation near water courses and the surrounding landforms in the Philippines. Such assessment was reinforced by the informations gathered from the local residents of the project areas. However, among the five river basins that were covered by the archaeological survey, it was the area near the Pasig-Potrero River that yielded cultural materials. Despite the information gathered from the local residents that indicated potentials for archaeological resources, the survey yielded negative results in the other eastern river basins. One of the main factors that contributed to the negative results of

the initial archaeological survey on these river basins was the thick deposits of pyroclastic materials (lahar or ash falls) on areas which were previously reported to have surface findings of artifacts. Presence of cultural materials on the surface may have been covered by lahar or ash falls. The alteration of landforms due to erosion caused by lahar and floodings is another contributing factor for the negative result of the archaeological survey.

The archaeological survey along the Pasig-Potrero River resulted in the identification of two archaeological sites, namely, Balukbuk and Maniknik, Dolores in the municipality of Porac. Several earthenware sherds were recovered in Balukbuk.

At 80 meters above sea level elevation, a considerable number of archaeological materials was recovered in a farmland in Cangatba (S230 W from Mount Arayat), municipality of Porac. The volcanic ash was about 11 to 18 cm in thickness, while the soil was clay and loam with a considerable amount of organic materials. The following is the list of artifacts recovered in a 600 meter Cangatba sugar plantation:

Barangay Cangatba, municipality of Porac: Surface Collections (III-93-I)

Stoneware sherd base, part with greenish-yellow glaze, most likely a part of a basin probably Late Sung to Yuan Dynasty (13th to 14th centuries A.D.; see Figures 10 and 12).

1. III-93-I-1 Stoneware Jar sherd associated with plain earthenware sherds
2. III-93-I-2 Earthenware sherd, part of a basin (probably the cause of black soot was due to burning of grass)
3. III-93-I-3 Earthenware sherd, part of a stove
4. III-93-I-4 Earthenware sherd, plain, exerted rim, plain, most likely part of a cooking pot
5. III-93-I-6 Earthenware sherd, plain, part of rim
6. III-93-I-7 Earthenware sherd, plain, part of basin
7. III-93-I-8 Earthenware sherd, plain, part of rim
8. III-93-I-9 Earthenware sherd, part or rim
9. III-93-I-10 Earthenware sherd, part of lip rim
10. III-93-I-14 Grayware sherd with square foot rim, Early Ming (13th-14th centuries A.D.)

11. III-93-I-15 Grayware sherd with grayish-green glaze, Early Ming (14th century A.D.)
12. III-93-I-16 Celadon sherd (Chinese), Ming Dynasty (14th century A.D.)
13. III-93-I-17 Grayware sherds, probably Yuan to Early Ming (14th century A.D.)
14. III-93-I-18 Grayware sherd (stoneware) sherd
15. III-93-I-19 Grayware sherd, most likely from a plate, probably Yuan -Early Ming (13th - 14th centuries A.D.)
16. III-93-I-21 Whiteware sherd
17. III-93-I-22 Stoneware sherd with yellowish green glaze (Chinese)
18. III-93-I-23 Grayware sherd from a plate
19. III-93-I-24 Stoneware sherd with brown glaze (Chinese)
- 20 III-93-I-13 Iron slags

### **Historical Landmarks**

Historical landmarks were also found in several areas visited, namely:

1. Restored Spanish church with a bell marked 1836, Dolores, Porac, Pampanga.
2. Spanish bridge with adobe block foundation and granite flooring in Sto. Rosario, Mexico, Pampanga (Figures 12 and 13).
3. Restored Spanish church founded by the Augustinians in 1738, Bacolor, Pampanga.
4. Restored Spanish church with a bell marked 1897, Angeles City, Pampanga.
5. Restored Spanish church founded by the Augustinians with a bell marked 1854, Porac, Pampanga.
6. Restored Spanish church founded by the Augustinians with a bell marked 1878, Santa Rita, Pampanga.
7. Restored Spanish church with a bell marked 1868, Floridablanca, Pampanga.

8. Restored Spanish church with a bell marked 1886, Magalang, Pampanga.

### Other Cultural Resources

There were several Aeta communities and settlement areas reported to the team in the provinces of Pampanga and Tarlac. However, during the course of the archaeological survey, only the Sapang Uwak area in Porac, Pampanga was visited because of its proximity to the project area.

In Sapang Uwak, an Aeta resettlement (S240 W from Mount Arayat) is situated on a plateau and slopes of the hills. The present inhabitants in the area used to live in Paanan Pinatubo before the eruption of the Mt. Pinatubo. Due to the eruption, they were forced to leave their original settlement and lived in several evacuation centers until they were settled in Sapang Uwak.

Other settlement or evacuation areas of the Aetas were not visited because most of these settlement areas are far from the project areas. The Aetas in Pampanga and Tarlac were categorized into three groups by the Office of the Northern Cultural Communities (personal communication, Rivera 1993) and these are the following: Aeta, Hung-ey and Abelling. Although there are no clear distinctions of these Aeta groups, the ONCC described the Hung-eyes and the Abellings as outgrowth of the Aetas. The physical structures of the eastern Mount Pinatubo Aetas (Hung-eyes, Abellings and the Aetas) are almost similar except that the Hung-eyes and Abellings do not possess hair as kinky as the Aetas. The Hung-eyes, according to the ONCC, are the only member of the eastern Mount Pinatubo Aetas that practiced teeth filing. The practice of filing or grinding teeth maybe regarded as an enhancement of their appearance.

A total of 23 sites have been identified by the team as existing government and non-government settlement and resettlement areas for the Aetas in the provinces of Pampanga and Tarlac. Most of these settlement areas are the original habitations of the Aetas that were abandoned following the 1991 eruption. The habitation areas of the Aetas are strategically located near the various river systems (Figures 7, 8 and 9). The following is the current list of settlement and resettlement areas of the Aetas in the provinces of Pampanga and Tarlac:

Tarlac	Pampanga
Kalangitan (Capas)	Sapang Uwak (Porac)
Santa Juliana (Capas)	Villa Maria (Porac)
Bueno (Capas)	Planas (Porac)
Manibukyot (Capas)	Pio (Porac)
Bulacan (Capas)	
Batong Gatang (Capas)	
Sitio Pilien (Capas)	

Alunan (Capas)  
Pisapungan (Capas)  
Bantan Pula (Capas)  
Payapa (Capas)  
Tangan-tangan (San Jose)  
Maamot (San Jose)  
Pisapungan (San Jose)  
Agus (San Jose)  
Tala (San Jose)  
San Pedro (Tarlac)  
Sacoro (Tarlac)

## VII. DISCUSSION

The infrastructure development being done in several areas visited are generally concentrated in the lower reaches of each river basin. The disturbance caused by this development on the archaeological sites is considered to be minimal since engineering activities will be concentrated only on the main river channel and on the adjoining banks of the rivers. However, with the onset of the rainy season, the lahar coming from the higher elevation might cover several sites situated along these river systems, as in the case of Sitios Balukbuk and Maniknik of Barangay Hacienda Dolores in the upper Porac River. The archaeological sites on these two sitios have already been disturbed by lahar and floodings and it is expected that the situation will be aggravated by subsequent rainy seasons. The previous construction of a sabo dam in the upper Porac River apparently caused the deposition of large volume of lahar behind the dam structure which covered the archaeological site at Sitio Maniknik. The subsequent collapse of this sabo dam structure reportedly resulted in the eventual erosion of a large portion of the site.

The discovery of a new archaeological site in Barangay Cangatba, including the recovery of cultural materials that were dated from the 13th to 14th centuries A.D., provides additional information on the extent of prehistoric settlements not only in the municipality of Porac but to other neighboring municipalities, as well. A good example was the recovery of cultural materials found in the municipality of Lubao by Beyer (1947) that were similar to those recently found in Barangay Cangatba, Porac. The existence of what could possibly be similar prehistoric settlements can be attributed to the river system, (Porac-Gumain River) that connects these municipalities. An extensive archaeological excavation in these two areas are therefore recommended.

The remaining four river basins, namely; Abacan, Porac-Gumain, Sacobia-Bamban and O'Donnell, despite their high potentials for archaeological resources, yielded negative results during the initial assessment survey. These river systems could have provided inland navigation and access for travel and migration during the prehistoric and historic periods. The adjoining banks of these major river systems could have been an ideal setting for cultural activities, particularly for habitation and trading. There is a great possibility that if engineering activities are extended to below the pre-eruption

grade/elevations, such activities could affect potential archaeological resources. It is on this premise that there should be monitoring activity for archaeological resources if the proposed engineering activities require extensive excavations and/or dredging below the pre-eruption grade/elevations.

The present engineering activities (e.g. channel excavation, levee constructions, sabo dams, etc.) undertaken along the five river basins will also serve to protect the historical landmarks of the municipalities of Bacolor, Santa Rita, Guagua, Porac, Lubao, etc. Several historical landmarks, mostly located along or near the river basins, have already been partly buried by lahar and are regularly affected by flooding. The present condition of these historical landmarks is expected to be further impacted during subsequent rainy seasons if no engineering interventions are implemented to control lahar flows and floodings.

The restoration or the reconstruction of the sabo dam in the upper Porac River will have an impact on the reported archaeological site in Sitio Maniknik, Barangay Hacienda Dolores. This sediment retention structure will cover almost entirely the whole area of the reported archaeological site in Sitio Maniknik. The collapse of this sabo dam will have greater impact on the reported archaeological site and this was observed recently during the archaeological survey conducted by the team. The Aeta community living in Sitio Sapang Uwak which is located near the vicinity of Sitio Maniknik, will also be impacted with the restoration of the old sabo dam. At present, this Aeta community is utilizing this upper reaches of Porac River for resource extraction activities such as for potable water and for gathering of fish and shellfish. With the deposition or retention of large volume of lahar by sabo dam on this section of the upper Porac River, it is possible that this will disrupt cultural activities of the Aeta community.

The devastating effect of the massive lahar deposition in 1992 in Barangays Dolores and Tabun, municipality of Mabalacat, are good examples of recording the formation processes of archaeological sites. The systematic archaeological recording of site abandonment processes will benefit a number of people and scholars, since, for the first time there is a direct observation on how people behave in the context of distress and danger before and after an unimaginable calamity so that theories and hypotheses can be formulated from the data generated in this activity. According to Dizon (1993), "in this classic emergency situation where archaeological site is an immediate result, it will be good to record the items which will become artifacts or material cultures, including features like remains of walls, foundations, floors, fire hearts, etc. that were left at the site by people at the time of abandonment and through the years when people come back to retrieve some of the material cultures that can still be used by them."

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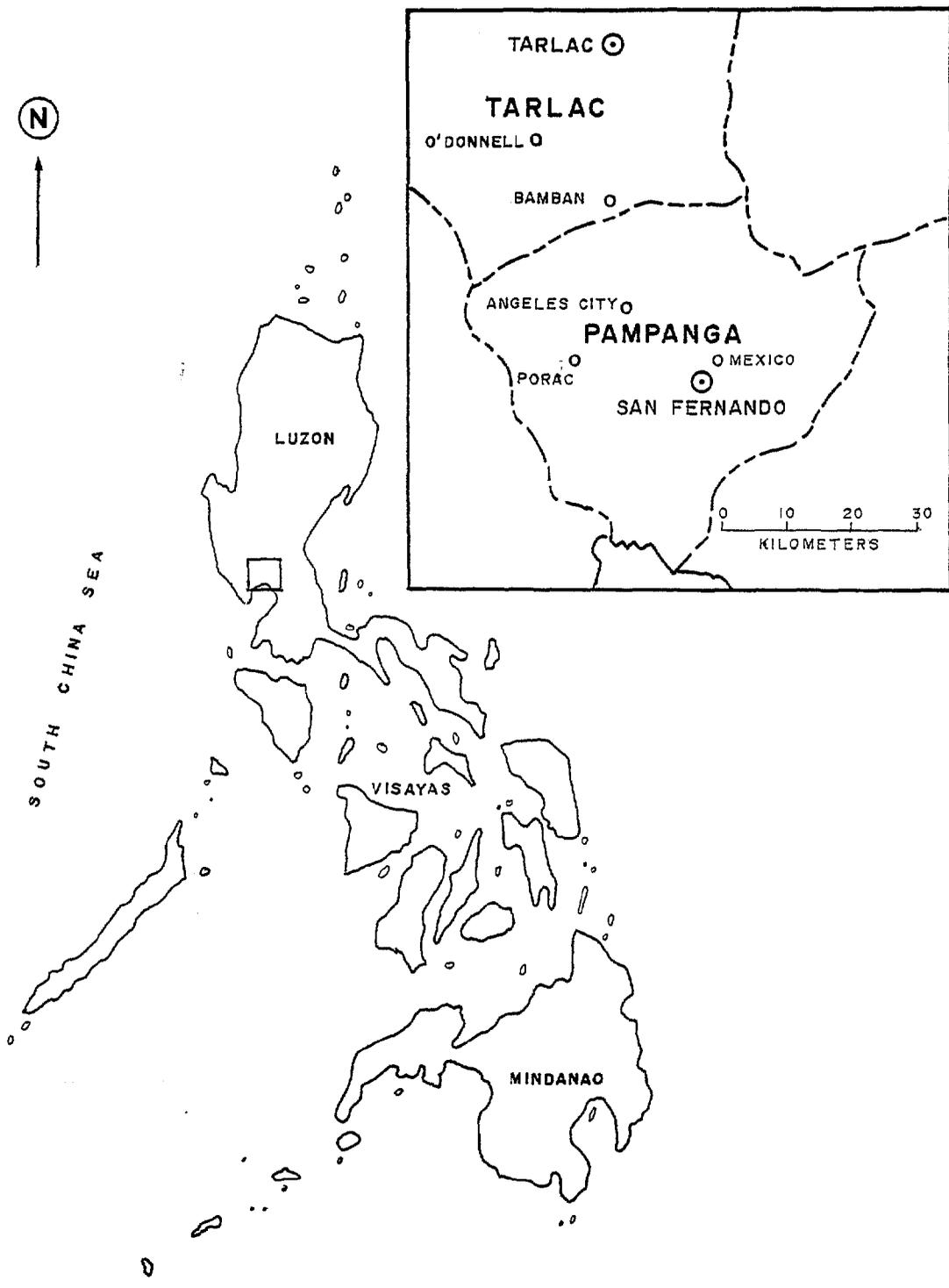
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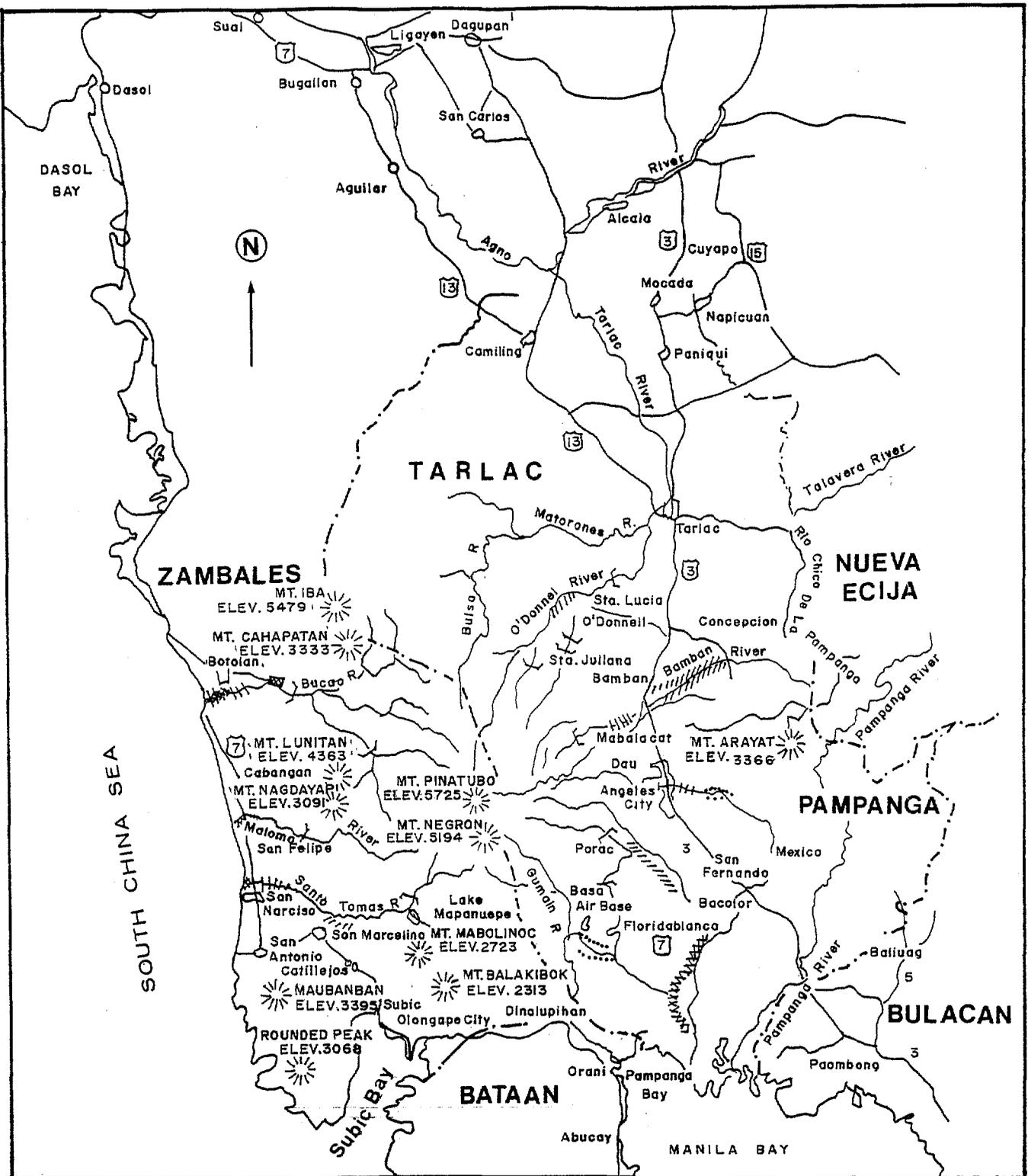
## **IX. ACKNOWLEDGMENT**

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MAP OF THE PHILIPPINES SHOWING PAMPANGA AND TARLAC

Figure 1



### MT. PINATUBO HAZARD ZONES AND POTENTIAL MEASURES

- |  |  |  |                         |  |                    |
|--|--|--|-------------------------|--|--------------------|
|  | Unstable/sediment laden channel          |  | Shallow flooding        |  | Dredging           |
|  | Mudflow prone areas                      |  | SABO Dam                |  | Channel Excavation |
|  | Shallow flooding and sediment deposition |  | Grade Control Structure |  | Bank Protection    |
|  | Ponding                                  |  | Channel Constriction    |  | Levee              |
|  |  |  |                         |  | Grain              |

SCALE IN KILOMETERS

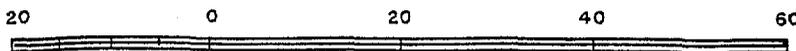
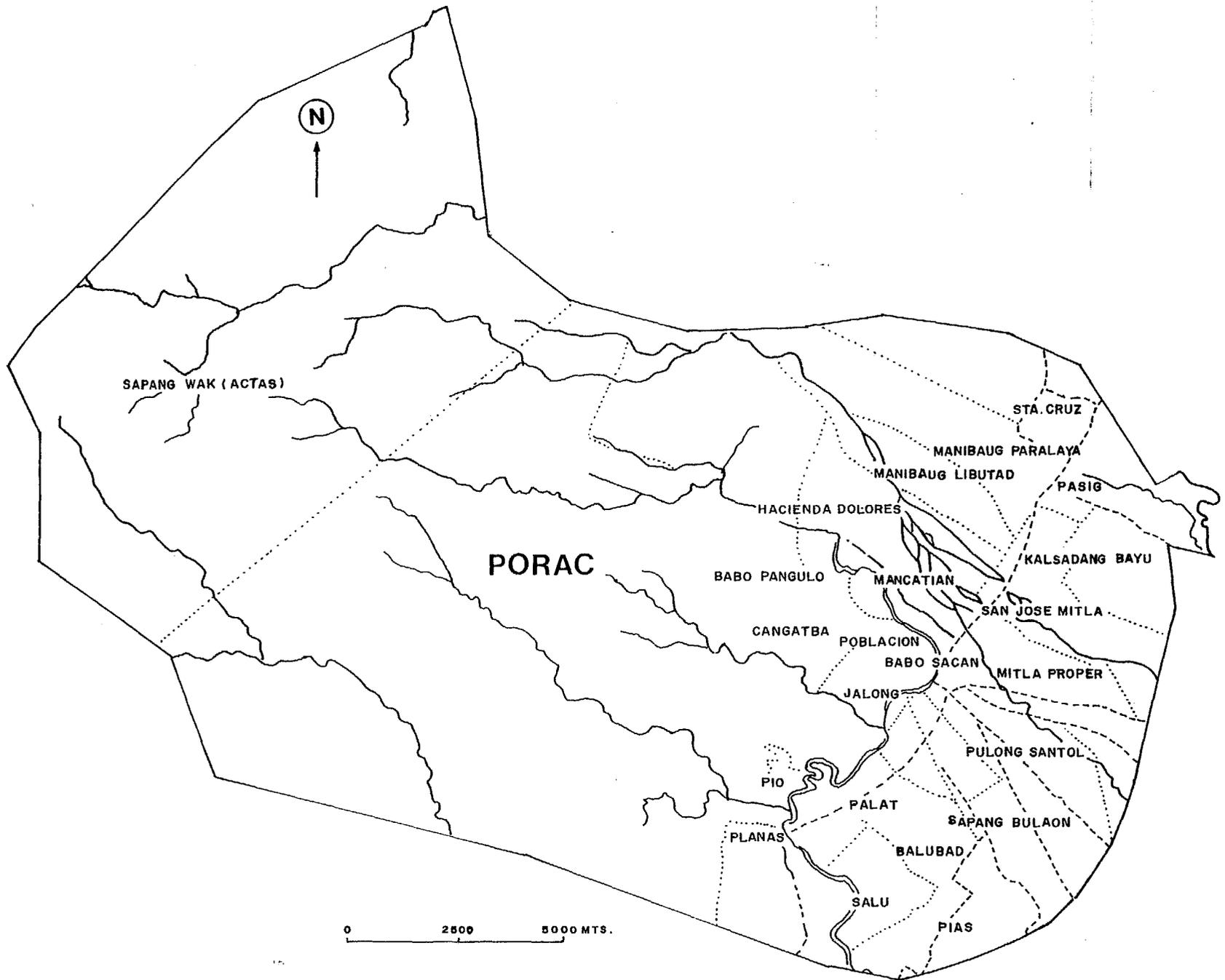


Figure 2



MAP OF THE MUNICIPALITY OF PORAC SHOWING THE BARANGAYS

Figure 3

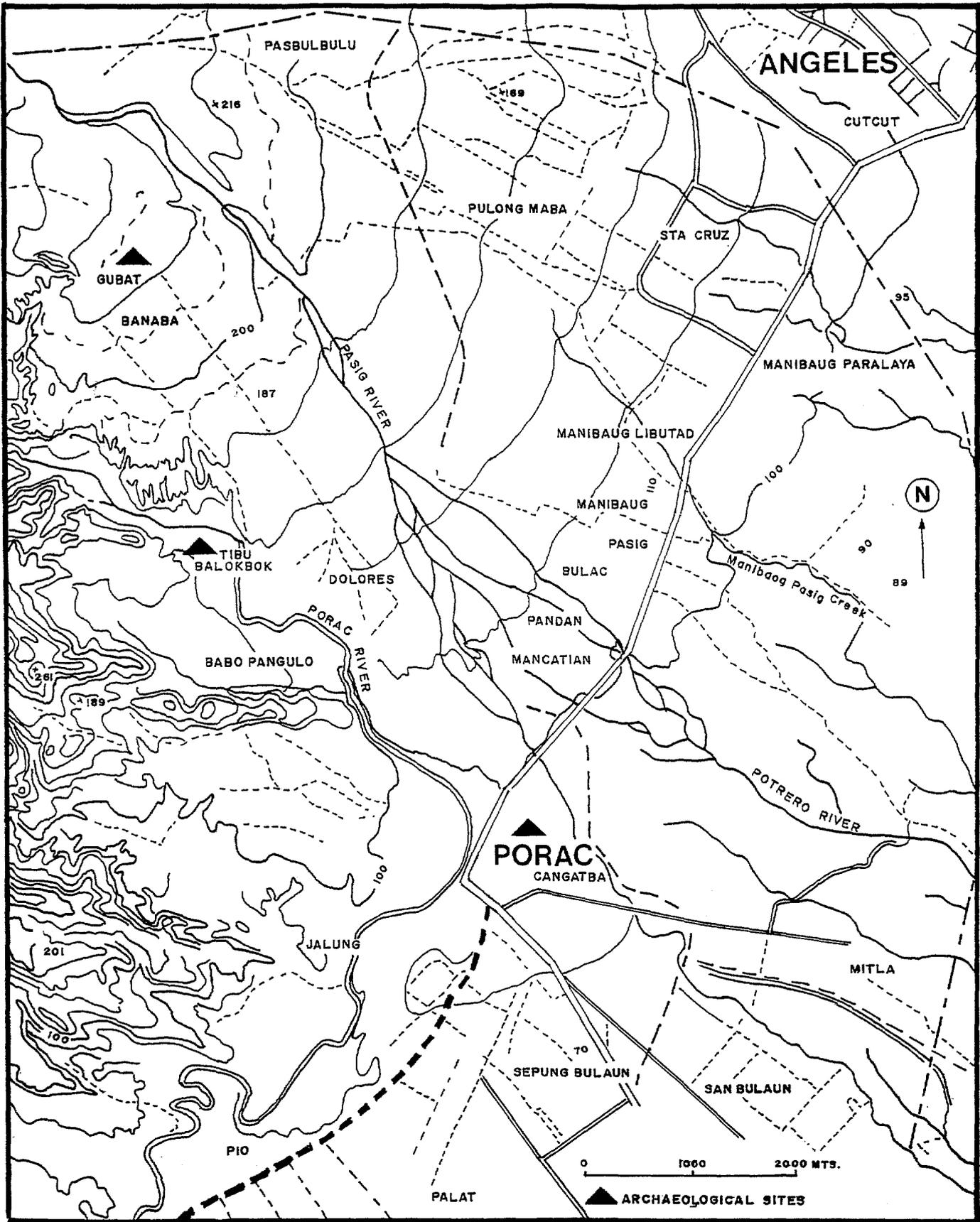
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MAP OF THE MUNICIPALITY OF MEXICO SHOWING BARANGAY STO. ROSARIO

Figure 4

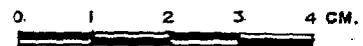
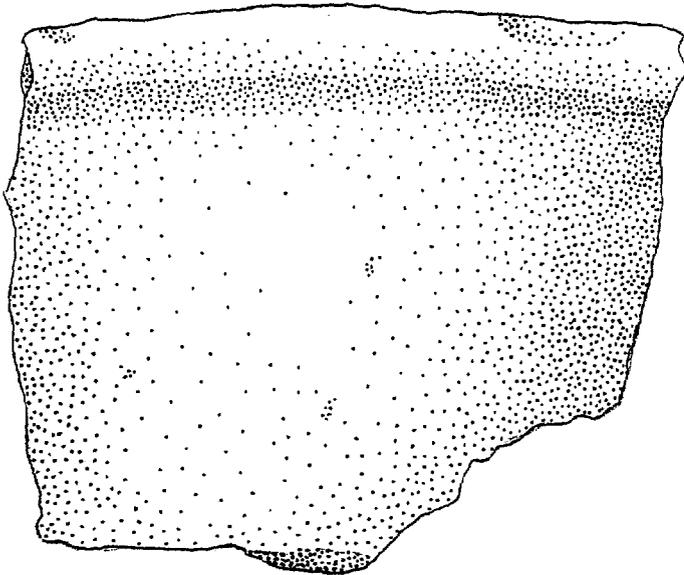
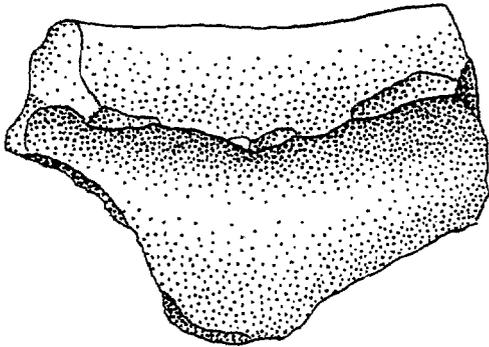
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MAP OF THE MUNICIPALITY OF PORAC SHOWING THE ARCHAEOLOGICAL SITES

Figure 5

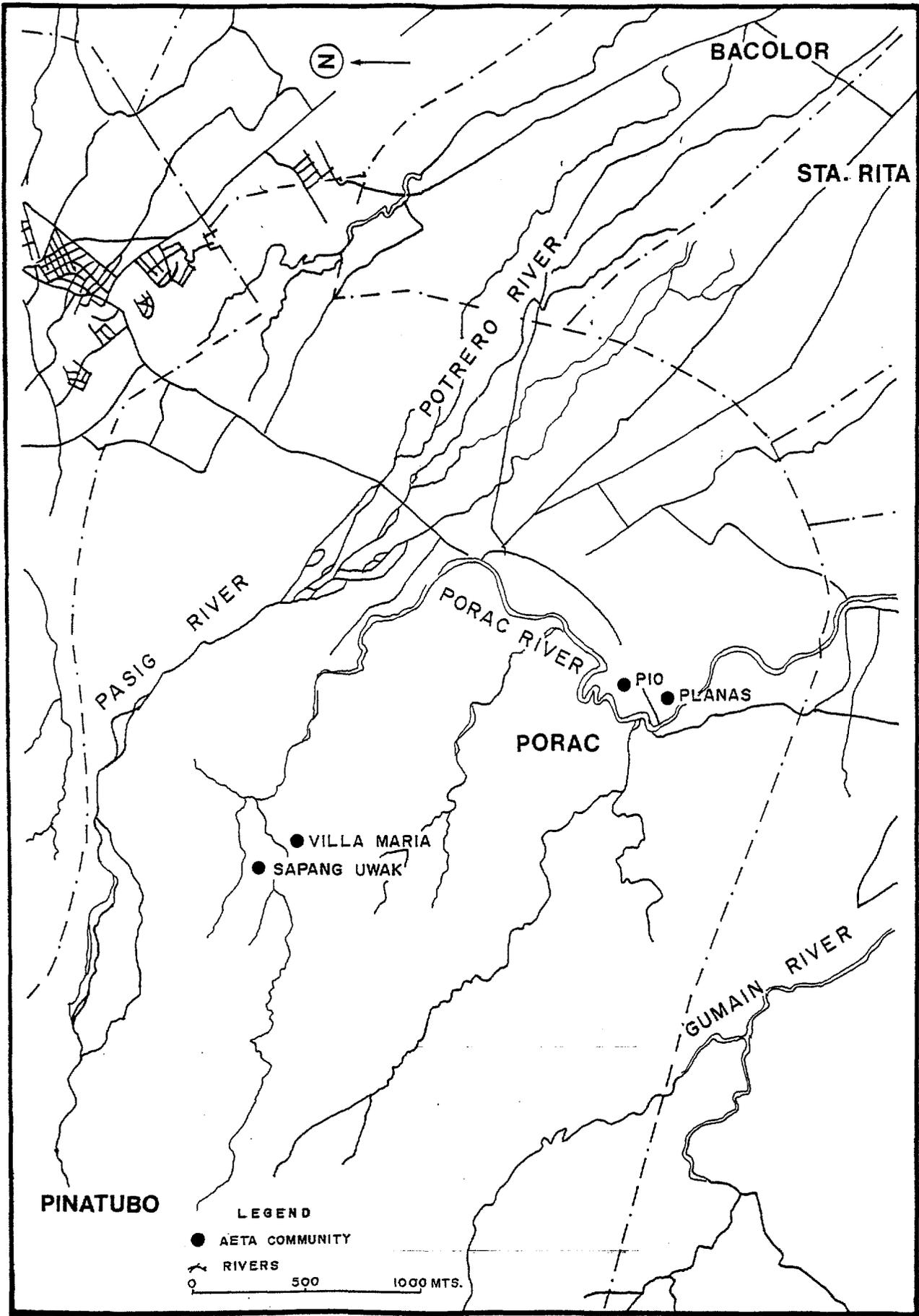
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EARTHENWARE SHERDS RECOVERED IN CANGATBA, PORAC

Figure 6

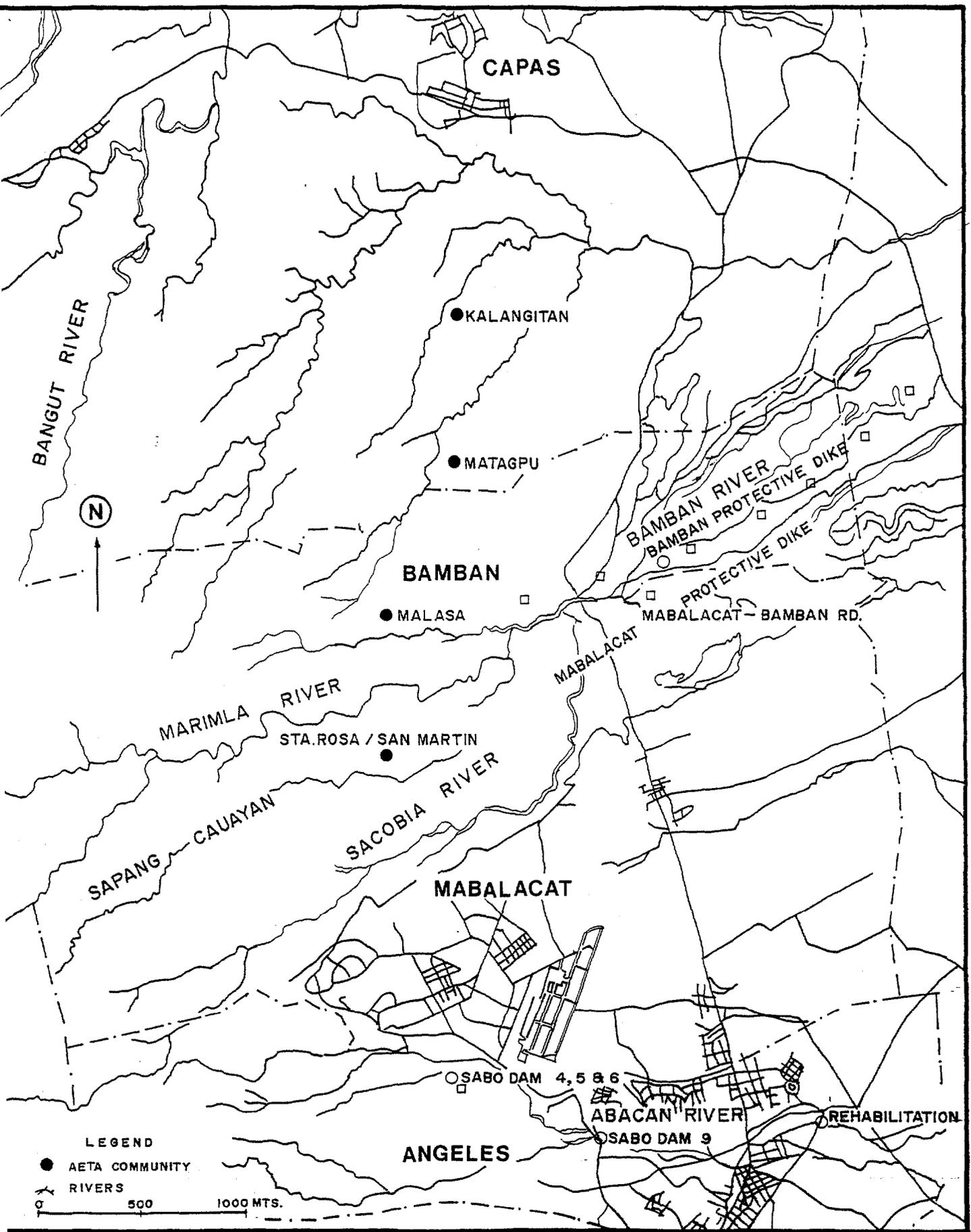
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MAP SHOWING THE LOCATION OF THE AETA COMMUNITIES

Figure 7

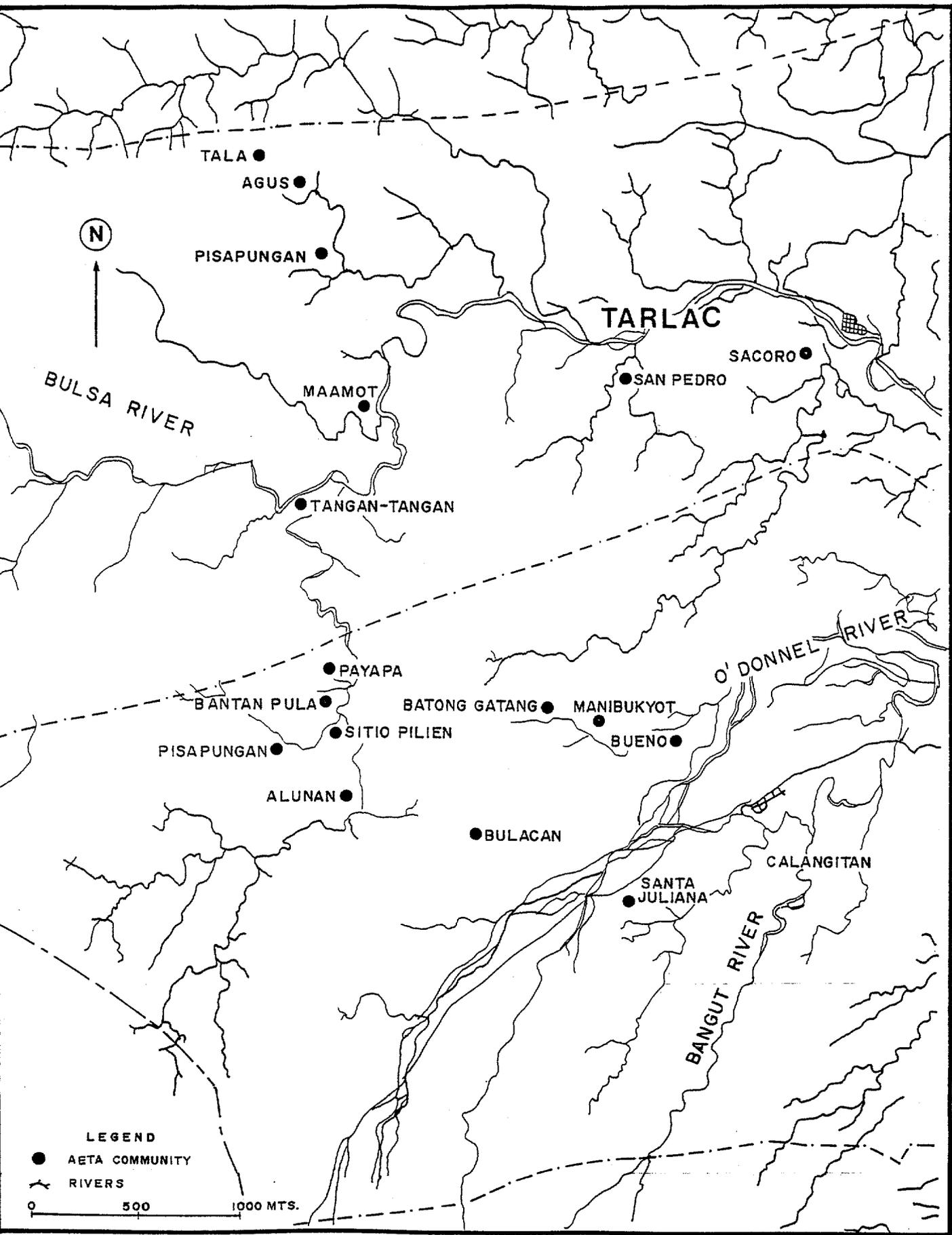
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MAP SHOWING THE LOCATION OF THE AETA COMMUNITIES

Figure 8

26



MAP SHOWING THE LOCATION OF THE AETA COMMUNITIES

Figure 9

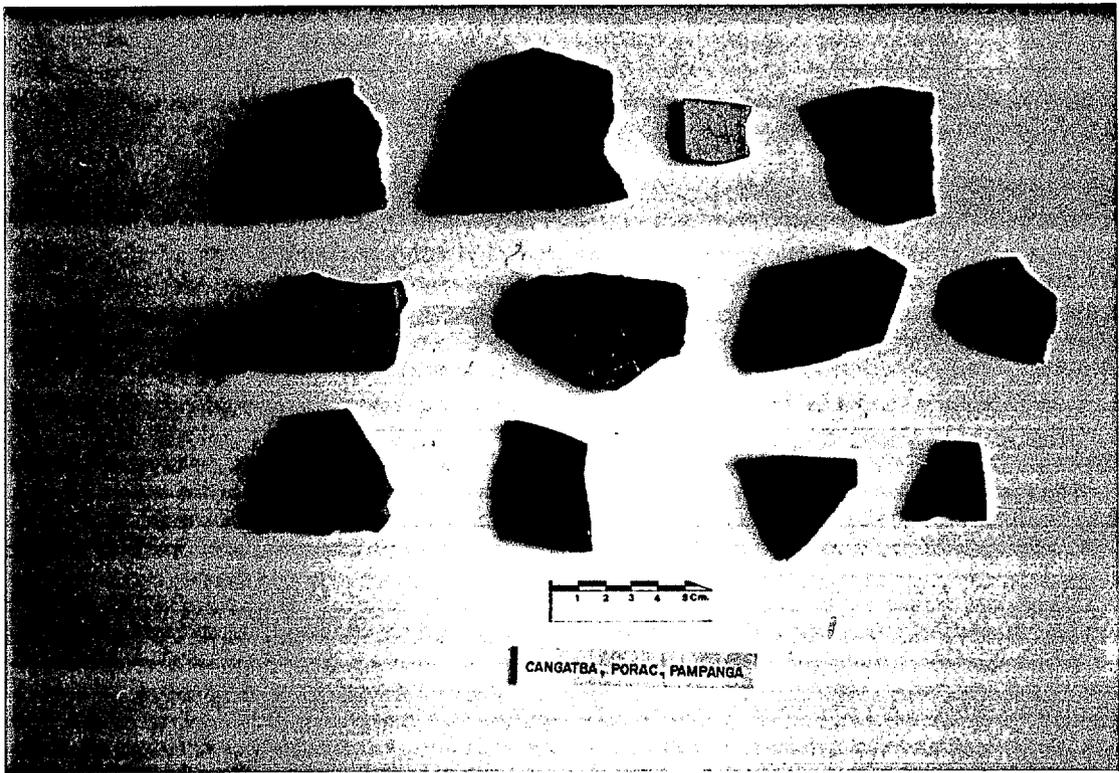


Figure 10. Sherds of tradeware ceramics attributed to the Sung Dynasty period (12th to 14th centuries A.D.) found in the sugar cane field in Barangay Cangatba, Porac, Pampanga.

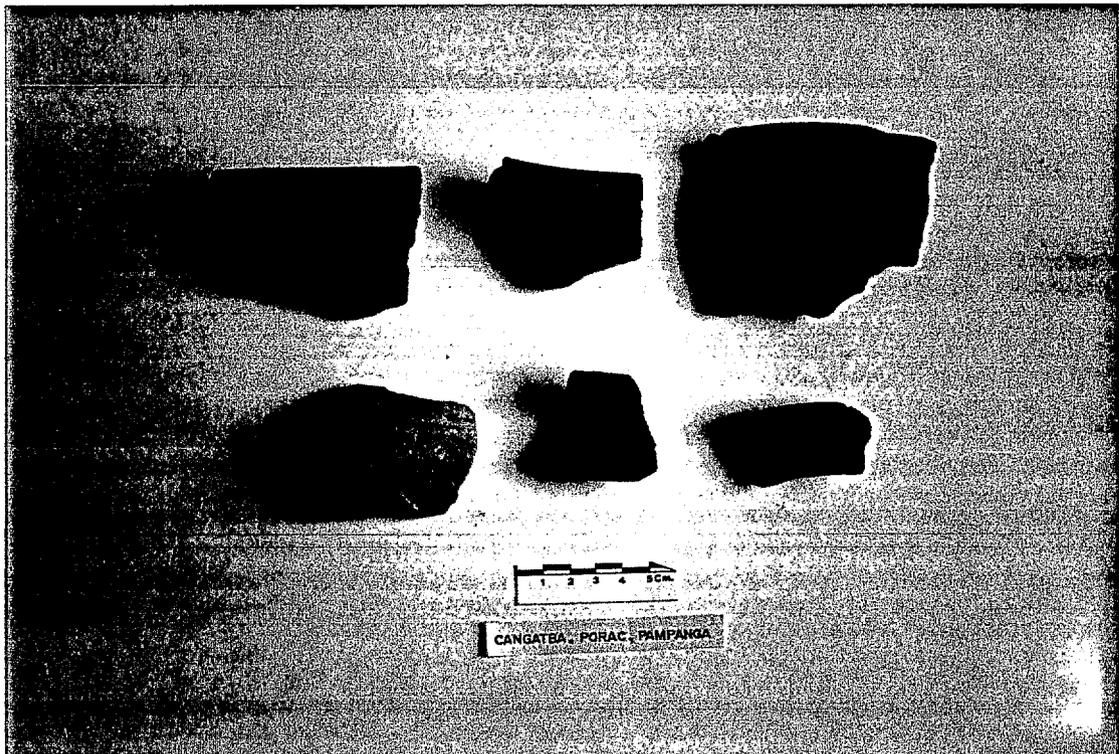
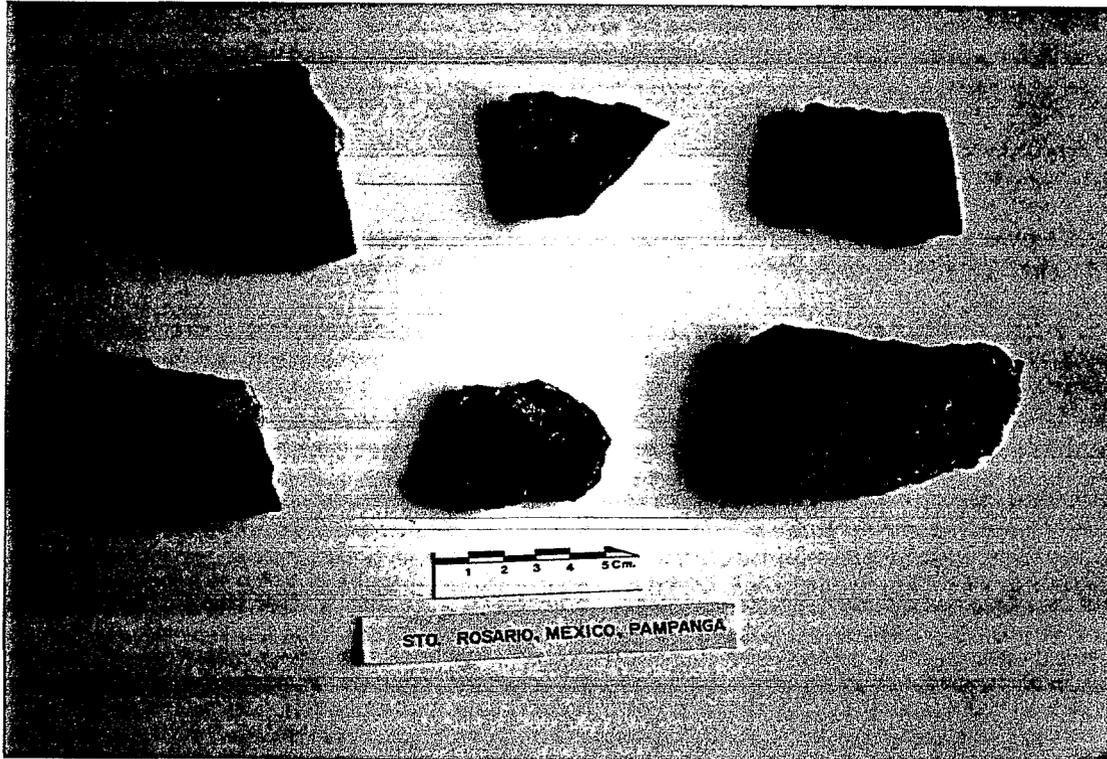


Figure 11. Representative samples of local pottery sherds found associated with the tradeware ceramics found in Barangay Cangatba, Porac, Pampanga.



**Figure 12. Old Spanish bridge made of granite and adobe found in Barangay Santo Rosario, Mexico, Pampanga.**



**Figure 13. Sherds of locally-made pottery found as part of construction materials to reinforce the wall of old Spanish bridge.**