

PRELIMINARY NOTES FROM ORAL HISTORY AND LITERATURE ON THE *BALDI* OF ILOCOS SUR, PHILIPPINES

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ABSTRACT

Stone or brick-and-lime vats locally referred to as baldi occur across the province of Ilocos Sur, Philippines. Many of the baldi must have been constructed for the purpose of natural indigo dye production from the locally-grown indigo plant. This was important to the Ilocos economy and contributed to the wealth of the historic town of Vigan listed as a UNESCO World Heritage Site. However, some vats had been used for different production activities, including those that apparently changed function at certain points in time, attributable to the shifts in the economy of the region. Most or all of the vats had ceased being utilized for livelihood-related production since around the 1960s or even earlier. Overall, the vats should be viewed not as generic cultural features with a single function, but as tangible cultural heritage that must have had a variety of functions across space and time given site-specific and dynamic environmental, economic, and cultural contexts. They merit further historical-archaeological research, particularly in relation to the history of Vigan.

INTRODUCTION

The Constitution of the UNESCO stipulates that it will “maintain, increase, and diffuse knowledge by assuring the conservation and protection of the world’s heritage” and by laying

out recommendations on relevant international conventions for this end. Early on, the UNESCO has noted of increasing threats to the world’s cultural and natural heritage, “not only due to traditional causes of decay, but also by changing social and economic conditions” that heighten the situation towards more daunting occurrences of damage or destruction. This pressing matter of protecting the cultural heritage has led the UNESCO to the 1972 Convention Concerning the Protection of the World Cultural and Natural Heritage. The Convention defined cultural heritage and natural heritage, including the designation of World Heritage Sites, the reasons and manner of their protection, and all member nations’ assumed responsibility to protect them.

In the Philippines, heritage is protected against possible damage or destruction, including those that may be brought about by infrastructure projects and similar activities. The 1987 Constitution is explicit in guarding the country’s cultural heritage where Article XIV, Section 16 expresses that “All the country’s artistic and historic wealth constitute the cultural treasure of the nation and shall be under the protection of the State which may regulate its disposition”. Legislations were enacted to create policies that would fulfill these Constitutional principles. Republic Act (R.A.) 4846, known as the “Cultural Properties Preservation and Protection Act” and enacted in 1966, aims to preserve and protect cultural properties such as “old buildings,

monuments, shrines, documents and objects which may be classified as antiques, relics or artifacts, landmarks, anthropological and historical sites, and specimens of natural history which are of cultural, historical, anthropological and scientific value and significance to the nation". Among many purposes, the "National Cultural Heritage Act of 2009" otherwise known as R.A. 10066 reinforces the protection of built heritage and considers structures that are at least 50 years old as cultural property "unless declared otherwise by the pertinent cultural agency". This law also strengthens the National Commission for Culture and the Arts (NCCA) and other affiliated national cultural agencies that are responsible for crafting policies and programs on, and ensuring, the protection, preservation, conservation or safeguarding, and promotion of the Philippines' cultural heritage. The "Local Government Code of 1991", popularly known as R.A. 7160 also provides for the preservation and promotion of culture, and requires government agencies to conduct consultations with local government units and communities before implementing any program within their jurisdiction, thus including those that may affect culturally important activities and resources. The protection of government buildings and spaces that are presumed as built heritage, cultural properties, or cultural landscapes against alteration, renovation or demolition and against projects that may impact on these heritage structures and spaces is also reiterated in the annual General Appropriations Act (n.d.).

Individual, pairs, or assemblages of stone or brick-and-lime vats locally referred to as *baldi* are sporadically spread over urban and rural, residential and agricultural landscapes across the narrow plains of the province of Ilocos Sur. While these cultural features of several but similar dimensions are in plain sight and recognized as "built during the time of the Spaniards" in the Philippines, most people even in the very communities where these are found barely know about their past use, much less their specific place in the cultural history of the region and nation. Nonetheless, stone and brick vats

form part of the Philippines' cultural heritage that our local communities associate with the past, if not directly with their own ancestors. These vats are immovable cultural heritage that arguably are testaments to a traditional industry or industries, craft and knowledge, thus are worthy of protection and preservation.

The inventory and documentation of "indigo dye vats" was proposed and conducted by the University of Northern Philippines – College of Architecture authors in 2017–2018. Rabang-Alonzo sought the participation of then independent researcher Maria Lourdes I. Ingel in the project after the former group's fieldwork with two architecture students' groups was already done (see article by Rabang-Alonzo *et al.* 2023, in this issue of JIPA). Ingel helped organize and interpret the data collected by the researcher-proponents and their students from the field, adding notes that she could gather from relevant literature and information from supplementary ethnographic probing that she managed to undertake as she wrote the main content of this paper.

The research aimed to establish the significance of stone and brick-and-lime vats as constituting parts of our tangible cultural heritage as well as reflecting some intangible heritage and history. Establishing the significance that the vats played in the cultural life of the province will lead to planning for their protection and conservation. The immediate environment where these heritage structures belong can be presented in the proper context for educational interests and possibly, to bring about economic benefits at least through cultural tourism.

Overall, the project sought to document surviving stone and brick-and-lime vats in the northern towns of Ilocos Sur, with eight goals. Goals 1 to 5 are covered by Rabang-Alonzo *et al.* (2023), and goals 6 to 9 are covered here. Preliminary notes from oral history and relevant literature, and insights on the inventoried stone/brick-and-lime vats are presented, based on oral accounts shared by the few key informants and the limited literature that the researchers could reach within the short project duration.

1. Establish the location of stone and brick-and-lime vats in the northern towns of Ilocos Sur;
2. Establish their number;
3. Determine their construction methodology and materials of construction;
4. Inscribe their architectural character and features;
5. Evaluate their current physical condition and contexts;
6. Ascertain ownership;
7. See the present use of these vats;
8. Determine the owners' plans regarding the vats; and
9. Discover the value the owners put on these vats.

SUMMARY OF THE VATS

In 2017–18, the research team inventoried a total of 63 stone/brick-and-lime vats or *baldi* in 17 separate sites found in 10 barangays, in eight towns north of the heritage city of Vigan. From north to south, these towns include Sinait, Cabugao, San Juan, Magsingal, Santo Domingo, San Ildefonso, San Vicente and Bantay. Notably, 24 of the 63 vats and six of the 17 vat sites are in San Juan, giving the town more than one-third share of the current inventory. Fifty-seven-year-old informant Eduardo Retuta Cruz of Barangay Saoang, San Juan related that in fact, there were more of these vats (at least in one site in his village) when he was young, but that over the years, some had been demolished as the lands were cleared for agriculture.

At this preliminary juncture, the following can be proposed. The kind of material used to build the vats may, for one, suggest association between construction technology and locally available resources at that period. On the other hand, similarities among the vats (across sites) in terms of both construction materials used and dimensions may direct us towards several assumptions that, again, could be proven true or debunked through future, more in-depth research. (1) The vats were built using the dominant construction technology during that time, and according to what was considered as appropriate and efficient for the original purpose that the vats were to serve. (2) Vats that have the same architectural characteristics were built

contemporarily. (3) Vats of comparable dimensions were utilized for similar functions and, especially for sites with assemblages of two or more vats, for the same stages in the process of making the same intended product/s. In addition to the last point, the vats may have changed functions through periods as demand for certain products ebbed and as new needs and opportunities emerged. And it is equally interesting to find out how the *baldi* fared efficiency-wise as these accommodated new uses that did not exactly have the same production requirements, and did not take the same process, as those of the product/s that the vats were at first built for. This information, when obtained, should serve as leads to other information relevant to a broader inquiry on the *baldi*, i.e., on the livelihood activities and industries of the Ilocos at different politico-economic periods.

Context of vat sites, ownership

Of the 17 vat sites, 12 are located in residential/semi-residential areas while five are situated in fields that are still used wholly or in part for agriculture. Previous ownership or transitions of ownership of the properties where the vats are found have not been amply established at this point of the documentation. Nevertheless, all the six sites in San Juan are said to be presently owned by or under the stewardship of descendants of the original owners, the people formally recognized as owners of the lands during the Spanish colonial period through the American colonial period (even if other people may have owned or at least occupied and/or utilized said lands prior to colonial government-instituted ownerships). These original owners include informants Eduardo Cruz and 101-year-old Arsenio Agbalog of Barangay Saoang, San Juan, and the late Marino Retuta of Barangay San Isidro Norte, also in San Juan.

The lot where the vat assemblage in the lone recorded San Vicente site is located is currently owned by the family of 84-year-old informant Preciosa Advincula Navarro of Barangay San Sebastian whose grandfather was an overseer of the sizeable tracts of farmlands known to be owned by the Sebastian-Singson families (personal communication on 23 June 2018 from

85-year-old informant Lourdes Rocero, who could also vividly recount the stories of her late father, Roman Rocero, about how the vats were used in making indigo dye cakes). Neither Navarro nor her neighbor, Lourdes Rocero, however, have knowledge about who owned the vats, and Lourdes Rocero's nephew, Melanio Andino, also did not think that these vats belonged to the Sebastian-Singson families. The Roceros themselves owned several vats, but these were all lost, having been washed away as the lands along the Bantaoay River that borders the village to the east have been eroded by the raging waters through the decades.

On the other hand, 64-year-old informant Alejandro Veraflor Garcia of Barangay An-annam West, Bantay identified with certainty that the largest vat assemblage covered by this documentation, as well as the land in which it sits, originally belonged to the Quema-Crisologo families. Such account on the previous ownership of the vats and the land that has long been subdivided and distributed among tenants through the government's Land Reform program decades ago is a very useful piece of information that more than lends itself to this research. For while Garcia's knowledge of the last function of the vats is different from the focus of this research, that is, the use of the *baldi* for indigo dye production, the said past Crisologo ownership jibes with an important historical note, as shall be seen later.

Evidence on usage in four vat assemblages

Especially in the larger vat assemblages, certain features deserve a close look as they could later provide clues regarding the product/s that were made there, and the process or stages, scale, and efficiency of production operations. Here, focus is given to four vat assemblages: The site with 11 vats in Barangay Saoang, San Juan (Site 3.4); one in Barangay San Isidro Norte, San Juan, with four vats (Site 4.1); the site in Barangay San Sebastian, San Vicente, also with four vats but with identified functional features (Site 5.1); and the largest assemblage with 18 vats in the only site documented in Barangay An-annam, Bantay (Site 10.1). Please see Tables 1 and 2 in the

accompanying article by Rabang-Alonzo *et al.* (2023) for further detail.

Site 3.4, Saoang, San Juan

This site and vat assemblage occupies an area of about 120 square meters, and is situated northeast of a spring (or creek) that most likely served as water source for the production. Its 11 vats are organized in two rows.

The first row has six contiguous vats of the same diameter of 2.2 meters, each one attached to the next through the wall, and neatly running horizontally from northwest to southeast. While the two vats in the middle are 2.8 meters high, the other four are 2.4 meters high.

The five vats on the second row, on the other hand, are arranged slanting to the southeast, obviously following the shape or flow of the spring below. In this row are two groups of vats separated less than 1 meter apart: One group consists of a pair of vats 2.8 and 1.8 meters wide, with the same 1.5-meter-height, that are attached to each other; while another consists of one 2.8-meter-wide and two 1.8-meter-wide vats all 1.7 meters high that are likewise attached one to the next by the wall.

Site 4.1, San Isidro Norte, San Juan

On this site, two pairs of vats are laid out in such a way that in one pair, the wider vat of 2.8 meters wide and 0.80-meter-high sits immediately to a narrower (1.6 meters) but taller (1.1 meters) vat. The other pair consists of equally-sized vats that are 2.2 meters wide and 2 meters high, hence about twice taller than the first described pair.

While the two pairs are separated, the pair of vats with the same sizes is connected through a gutter to the wider but shallower vat of the other pair.

Site 5.1, San Sebastian, San Vicente

This assemblage consists of four vats of different dimensions, a 0.90-meter-wide well, and a rectangular water storage vat. While also a relatively small assemblage, the San Sebastian site has become the more promising in terms of illustrating the production process that has been undertaken there in the old times. The more definitive descriptions of the particular uses of the vats and features were obtained through

knowledge shared by the late Melanio Andino and by his aunt, Lourdes Rocero, both of whom had learned about the vats' uses through the oral accounts of their elders. (Andino was our 67-year-old key informant living in Vigan at the time of the study. His mother was a first-degree cousin of Lourdes Rocero. He also recognized Preciosa Navarro as his relative.)

Andino and Rocero identified the *katayagan a baldi* (tallest vat), which is 2.45-meter-wide and 3.1-meter-deep and sits northmost in the assemblage as the one used for the first step in the indigo plant fermentation. The next vat southeast is what Rocero specifically referred to as the *kalakkian* (male vat, that is otherwise called *kalalaki*), which is 2.3 meters wide, shallower, and sitting way lower than the rim of the tallest vat. Attached to the *kalakkian* on the south is the *kaba'yan* (female vat, otherwise referred to as *kababai*), which is the widest vat at 3 meters. And between the *kalakkian* and *kaba'yan*, attached on one of their sides, is a small vat 0.90-meter wide that served as catchment for indigo dye material that dripped from the buckets while the substances were transferred from the *kalakkian* to the *kaba'yan*. Immediately beside and almost attached to the tallest vat and female vat is the water well.

As Rocero pointed out, the vats (or at least some) have drainage holes at some elevation above ground level. A platform of similar brick-lime construction is also perched on the spaces between the vats and the well, on the middle of the assemblage, and this, according to Rocero (as she remembered her father's account), facilitated the transfer of materials from one vat to the next.

The purposes of the vats and features at the San Sebastian site will be appreciated later, where the functions of the vats are discussed.

Site 10.1, An-annam, Bantay

The An-annam site has the biggest assemblage with its total of 18 vats that are also the most massive in terms of size, although not the tallest. Considering the edges (perimeter) of the vat assemblage on the north, east, south and west, and including the ground spaces in between the rows of vats, said assemblage occupies an area of about 800 square meters.

The way the vats are organized is very remarkable: There are four rows of vats, with the northernmost and southernmost rows both consisting of three well-attached pairs of vats each. Said vats have the same dimensions of approximately 3.0 meters wide and 2.0 meters high. The easternmost pairs of each of these two rows have what seem to be stairs or elevated platforms for stepping. Near the lower eastern corner of the northern row of vats is a well approximately 1.3 meters wide.

The two middle rows situated between the northern and southern rows have uniformly-sized vats that are even broader at approximately 3.8 meters wide, with a depth of 1.8 meters. Each of these two rows consists of three vats, well-attached one after the other horizontally.

At the center of the assemblage is 6-meter-wide ground clearance that separates the two northern rows from the two southern rows of vats. While information on this site is lacking, it can be surmised that this relatively wider ground clearance must have both facilitated movement during production work and allowed some stocking and/or drying area for raw materials or finished products.

Moreover, conspicuous in many of the vats in the 13 sites where measurements were done is the presence of drainage holes on the vat walls, also confirming information given by Rocero.

The functions of the baldi across time

The research proponents referred to the subject of the documentation as indigo dye vats when they wrote the project proposal, in accordance with the dominant narrative about the original function of these stone/brick-and-lime vats. The indigo plant locally known as *tayum* is specifically listed as *Indigofera suffruticosa* Mill., also known as *I. anil* L. and *I. comezuelo* DC, by the Stuart Exchange webpage (2016) on Philippine medicinal plants. However, the same local plant widely distributed around the Philippine archipelago is also classified as the true indigo species *Indigofera tinctoria* L. (Cole 1922:406; Respicio 2014:50–51) that is native to the Philippines (Co's Digital Flora of the Philippines n.d.). Referring to *A Dictionary of Philippine Plant Names* by Domingo A.

Madulid, Pastor-Roces (1991:23–24) identifies the *tayum* of the Ilocano as both the naturalized *I. suffruticosa* and the native *I. tinctoria*. It appears from oral history, however, that many of the informants know of the *baldi* as having had uses other than for producing indigo dyes. Nonetheless, this discussion on the functions of the *baldi* should still take off from the indigo dye production narrative.

Coleman (1915) cited Spanish textbooks (written around 1890) to the effect that indigo was introduced by the Spaniards at the beginning of their conquest of the Philippine archipelago (i.e., the mid-sixteenth century), and stated that “the exportation of indigo must have begun about 1850.” However, some species of the indigo plant are native to the Philippines, and people at least of the Ilocos/northwestern Luzon began to exploit cotton for its fiber to be processed into yarn that they wove into fabric way before the Spaniards’ arrival. It is probable that they also prepared *tayum* to produce the indigo dye with which they colored the cotton yarn. Filipino textile scholar Dr. Norma A. Respicio (2010:9) wrote that cotton and *abel-Iloko* (traditionally woven textile of the Ilocos) were valued items that Asian traders brought with them from the Philippine archipelago. Indeed, Chinese junks carried indigo from the *tayum* plant as a trade item sourced from the Philippine archipelago, particularly from the Ilocos, as early as the ninth or tenth century (personal communication from Dr. Respicio to M.L. I. Ingel, 14 June 2018).

Pre-Spanish contact period cotton yarn production, and plant and natural dyestuff exploitation were, most plausibly, of simple technology, and for subsistence needs and limited trade. The system of fermenting *tayum* to obtain the indigo dye may have been introduced later, or if some fermentation process was done, this most likely did not necessitate the use of vats such as those found in the Ilocos. The Mexican experience may be offered as a comparable reference for what possibly occurred in the Philippines regarding the indigo plant and dye production. As Mexican textile scholar Dr. Amalia Ramirez imparted in an online discussion, while the indigo plant *xiquilhuatl* (also *jiquilite*) is native to Mexico, the *pilas*

(vats) system of indigo fermentation “was a part of an intensive labor plantation system that was not indigenous” to Mexico and Central America, “but developed for market oriented *añil* or indigo” with globalization beginning in the sixteenth century (personal communication from Dr. Ramirez to M.L. I. Ingel, 14 and 16 June 2018). She also said that the vat system in Mexico, consist(ed) of “male” and “female” vats, referred to (at least by informants in the state of Michoacán) as *macho* and *hembra*, respectively, thus corroborating information given by Lourdes Rocero on the *kalakkian* and *kaba’yan* vats (personal communication from Dr. Ramirez to M.L. I. Ingel, 23 June 2018).

The cultivation of both cotton and indigo reached plantation levels, and the wider-scale production of natural indigo dye in the Ilocos indeed occurred during the Spanish period in the Philippines. Spanish missionaries are said to have developed the cultivation of indigo, along with coffee and sugarcane, in the archipelago (Bourne 1903/1973). The colonial government encouraged the growing of indigo as a cash crop, and the export-oriented indigo industry “flourished in Central Luzon and the Ilocos region during the late eighteenth and first half of the nineteenth century” (Cortes 1975:133). Thus, while this development about said products was partly due to their value to the *abel-Iloko* industry that also produced important articles of trade, cotton and indigo were essential trade and export items on their own. Cotton, indigo and *abel-Iloko* were understandably among important local products that the Spanish colonial government collected as tribute (Respicio 2010, 2014:13).

Indigo, along with cotton, were grown as cash crops even in smaller towns such as “Zamora” [Burgos], Ilocos Sur in the nineteenth century (Pertierra 1988:37). Even after the indigo industry began to decline in the nineteenth century (Coleman 1915; Cortes 1975:134), the production of indigo from *tayum*, like the *abel-Iloko*, was so encouraged that the colonial government occasionally offered rewards to those who achieved excellent production of such items. For instance, the U.S. historian William Henry Scott (1986:8) wrote that in the Candon town fiesta of 1892 where an exposition of local

products was held, Mena Crisologo of Vigan was awarded a silver medal for his “entry of 113 hundredweight [5125.66 kilos, under the U.S. definition of a hundredweight] of top-quality indigo produced in his plant that year...” A silver medal was likewise awarded to Isabelo Abaya of Candon “for a display of textiles, blankets and table lines woven of Ilocano cotton.” Scott’s work (1986:91) also notes that Crisologo prospered in the indigo trade, and relates that indigo owned by Crisologo, later sold at public auction for P25,000, was among the items found by U.S. troops at the house of his nephew Isabelo delos Reyes in Tondo during a raid in 1899.

This raid occurred on the suspicion that a Filipino guerrilla fired from the building during the street fighting on 22 February 1899, when the Filipino-American War broke out. Crisologo was a writer and politician who became governor of Ilocos Sur, and also represented the province in the 1898–1899 Malolos Convention that produced the 1899 Constitution of the Republic of the Philippines (Arellano Law Foundation, <https://www.lawphil.net/consti/consmalo.html>). Abaya was a revolutionary who led the Candon uprising that drove the Spanish colonizers out and established the *Republica Filipina Katipunana* in Candon in 1898; he also led revolutionary forces against U.S. colonization and was martyred during the Philippine-American War in 1900 (National Historical Commission 2014).

Indigo dye production in two documented sites

Remarkably, Scott’s mentions of Mena Crisologo’s indigo production in 1892, the indigo in his possession during that 1899 raid, and the same man’s prosperity in the indigo trade shed light on the well-organized and largest assemblage of 18 stone/brick-and-lime vats documented in agricultural land in Barangay Annam, Bantay. Said land and vat assemblage was originally owned by the Quema-Crisologo families, for indigo dye production as implied by Scott’s information.

The oral history passed down by relatives and heard by Melanio Andino decades ago, and most especially, the vivid recounting by Lourdes Rocero of her late father Roman Rocero’s eyewitness account, clearly confirm that the vats

in the San Sebastian site were built for the purpose of making dye out of *tayum*. Born in 1933, Lourdes no longer saw the vats in her village being used for anything, but when they were young, Roman, as part of oral tradition, told his children stories about life in their riverine village that is also bordered by the sea on the west. Among these stories was the making of indigo dye cakes that Roman saw his elders engage in when he was a child. Roman was born in 1894.

Based on the stories passed on by her father, Lourdes Rocero related in Ilocano how indigo dye was produced in the San Sebastian vat assemblage site, herewith organized and translated:

Indigo plant materials were put inside the tallest vat in the assemblage. To start the fermentation process, the plant materials were submerged in water. The well that immediately sits west beside the tallest vat was the source of water used for the dye production. Water was drawn from the well and first stocked into the rectangular-like water storage vat west of the well. A person scooped up buckets of water from this water vat and passed it on to another person who was up the tall vat to pour water into the plant materials. The submerged materials were “pounded” [presumably, stirred] with the use of a wooden paddle that was fixed on a bamboo lever about a meter in length.

After a day, the “liquid” [technically referred to as the *indican*, a compound in *indigofera* plants that later becomes dye] from the tallest vat was drawn out in buckets and transferred into the *kalakkian*. Two persons could be involved at this stage: There was one who drew the substance out from the tallest vat, and he gave the bucket to another who waited down the platform, over some scaffolding. This second person poured the liquid into the *kalakkian*. The substance that the *kalakkian* now contained was left to settle. When the sediment, which was referred to by Rocero as *arinsaed* or “residue,” was

formed, excess water above was decanted, carefully drawn off the vat and thrown into the ground.

The sediment was later also decanted from the *kalakkian* into the *kaba'yan*. Waste of this material was avoided. There was the small and shallow vat almost inserted between the *kalakkian* and *kaba'yan* that served as catchment for whatever might drip from the bucket during the transfer from the male to the female vat. The material that was collected in this small vat was also scooped out and poured into the *kaba'yan*.

The substance in the female vat was afterwards mixed with *apog* (lime). The wooden paddle was again utilized to thoroughly beat and mix the indigo substance with the lime. After this, the material was once more left to settle. The excess water was likewise scooped out with much care in order not to disturb the sediment below, and thrown outside of the *kaba'yan*.

Later, the sediment that was now *napalet* (thick, dense), as Rocero put it, was cautiously scraped off from the *kaba'yan* like cakes. These dye cakes were put on top of a *papag* (bed-like platform) that was covered by *manta* (a fabric). The *manta* served as sheet into which the indigo paste cakes were spread and further drained. While over the *manta* in the *papag*, the indigo cakes were cut into bricks about an inch thick, and then dried.

Both Melanio Andino and Lourdes Rocero said that in San Sebastian, no curing or dyeing of yarn was done inside any of the vats, and so, the sole purpose of the *baldi* was for producing indigo dye bricks. Rocero recalled that the old folk instead soaked their cotton yarn in big wooden basins containing *aniel* (indigo dye) solutions.

The same informants believe that the indigo dye bricks that were produced in Ilocos were not yet in refined form. From what Rocero heard, the indigo bricks were transported to Mangaldan, although she could not be sure whether refining

was done in said town or elsewhere. She could neither tell where the products were brought to after Mangaldan. (Mangaldan is a town in the province of Pangasinan along the Lingayen Gulf, one of the most important areas in northwestern Luzon in terms of its role in people's movements and settlements, maritime trade, and the establishment of polities since ancient times (Canilao 2011)). It is probable though that some of the indigo bricks were shipped, most possibly through the seafaring *biray*, sometimes described as a big boat or a small ship, which has proven its worth "not only in trade, but in diplomacy and warfare during the Spanish period and was used as mode of transport in the Ilocos until at least the first quarter of the 20th century" (Canilao 2015). From Mangaldan, some would have been shipped to Manila, given Michael Armand Canilao's (2015) conclusion, from his research on the archaeology of the Cordillera and the Ilocos, that some articles of trade have been "off-loaded and new bartered ones loaded by vessels plying north-to-south or south-to-north in each of the regular port stops in Western Luzon, which included Vigan-Caoayan, Lingayen and Manila." For this, Canilao (personal communication to M.L. Ingel, 12 July 2018) cites corroborating sources such as Allegre (1998) and Dizon (2003, 2004).

Moreover, Andino also knew that the indigo bricks were shipped to Hongkong from the Philippines, and from there again shipped to other parts of the world; and that, it was in the final destinations that the indigo dye bricks were refined into another form, such as powder.

As far as Lourdes Rocero has learned from her old folk, the stone vats in their village were used for indigo dye production only until the late Spanish period. It could however be posited that such production continued in trickles until the early 1900s, during the first decade or so of American colonial rule. The relevant account is the 1915 article of the American principal of the Provincial High School in Vigan at that time, J. Harry Coleman. He described the process of indigo dye production that he either observed being, or knew of having been, undertaken in the province of Ilocos Sur. Coleman wrote of "groups of cylindrical masonry tanks" that he

noticed “along the main roads and in the remotest barrios.” He tackled production where “2 cylindrical vats or tanks from 2 to 3 meters in diameter and depth” were the commonly used equipment for the extraction of indigo from the *indigofera* plant. The classification of certain vats as “male” and “female,” as Rocero has explained and Ramirez corroborated, is again confirmed by Coleman’s narrative, albeit with minor variance in terminology: The two vats consisted of *el macho* or the *kalalaki* that “was near a well,” and *la hembra* or the *kababai* that “was within short distance from the macho, on slightly lower ground.”

While Coleman’s subject pertains to only two vats, compared to the four in the Barangay San Sebastian site, it should be remembered that six of the 17 vat sites that were included in the inventory have a pair of vats each. Thus, apart from offering here Coleman’s description of the production process in order to put it side by side with Rocero’s comparable narrative, Coleman’s may serve as good reference for what may have been done in many of the vat sites in Ilocos Sur:

The indigo was harvested in the early morning and the macho was filled with the leaves and stems, then enough water to submerge them was poured in and they were left to decompose and ferment. At the end of twenty-four hours the decomposed plant matter was removed, leaving a greenish-yellow liquid – the indican, a glucoside dissolved out of the plants, in solution. About three fourths of a cavan of the lime was sifted into the liquid, which was then thoroughly stirred to facilitate the chemical reaction between the lime, the oxygen of the air, and the enzymes from the plant. As soon as the liquid turned blue, the lime was allowed to precipitate, carrying the impurities to the bottom with it. The blue liquid was then run off to the hembra through bamboo tubes. An ingenious arrangement of spigots made it possible to run off the surface water as fast as it cleared. In the hembra the liquid was vigorously stirred with bamboo paddles for several hours each day to bring all parts in

contact with the oxygen of the air. When the desired color was obtained, the indigo was allowed to settle to the bottom and the water was run off. The sediment was molded into cakes or balls, dried in the sun, and sold.

Interestingly, Coleman (1915:406) also immediately followed the above illustration with a comment that “The method in general use at present is more primitive, earthen jars taking the places of ‘el macho’ and ‘la hembra.’” Does this mean that around the time he was writing the article around 1915, the school principal also observed that instead of the big “cylindrical masonry tanks,” more people went back to utilize the “more primitive earthen jars” for indigo dye production? If this is true, could it be inferred that at such point in time, the Ilocanos were already only producing small amounts of indigo dye for their own domestic needs, and so it became more efficient to revert to the earthen jars than to use the big stone vats? What then became of the *baldi*? What may this imply about the economy of the region?

Dyeing of cotton yarn in some of the vats

Forty-four-year-old Bernard Vicente of Barangay Sallacapo, Sinit has heard that the vats were used for dyeing yarn, where dyestuff came from plants, although he could not say what plants were exactly exploited for the purpose. Other informants such as Eduardo Cruz and Marino Retuta of San Juan, and 67-year-old Edwin Ceria of Barangay San Basilio, Magsingal, know mostly from the stories of their elders that at least the *baldi* in their villages or towns were used as containers in which cotton yarn was soaked into *aniel* (*añil*) mixture.

The centenarian Arsenio Agbalog particularly remembers that half of the *baldi* in his village in San Juan were filled with *aniel*-infused water, and it was into this that the yarn was immersed for coloring. Agbalog thinks, but could not be sure however, that the *aniel* used at the time the *baldi* were utilized for the yarn dyeing process was produced by the local people directly from the *tayum* plant. Agbalog’s uncertainty may be better understood by looking back at the period in which he grew up as a child, towards the end

of the first quarter and beginning of the second quarter of the twentieth century, which may have been part of the transition period for the industries (and economic life) of the Ilocos.

Some literature reveals that the production and use of natural dyes, including that from indigo, declined and eventually collapsed because of the introduction of commercial, synthetic, aniline dyes in the Philippines around the early 1900s, during the American colonial period. This was noted by Pertierra (1988) in the town of Burgos. The status of indigo production and dyeing of cotton yarn in Ilocos Sur at least until the second decade of the 1900s, and how the export of indigo had dropped and the industry struggled beginning in the early 1880s, are also evident in Coleman's article (1915). In addition, he observed that:

In Narvacan and Santa Catalina, a short time ago, about 60 percent of the women were engaged in dyeing; but the opening in Vigan of a dyeing establishment which used imported synthetic dyes greatly reduced their number. Within the past few months, because of the European war shutting off other sources of dyes, the price of indigo has risen and there has been a slight revival of interest in the industry ... The decline in exportation was due partly to adulteration of the product, but mainly to the introduction of synthetic dyes, which were cheaper and which shortened the time necessary for drying.

Despite the apparently brief slight revival of interest in the indigo export industry around mid-1910s, Coleman (ibid.) correctly predicted a bleak prospect for indigo production when he wrote that "There is no future for indigo culture ... for synthetic dyes will soon be in the market again, and with them the vegetable dye cannot compete."

The period of transition from natural to chemical dyes is also reflected in the work of Fay-Cooper Cole (1922:406, 426), where his fieldwork among the Tinguian (pejorative reference for the Itneg ethnic group) of the inner province of Abra in the early 1900s is

documented. Cole observed that "In recent years, an[i]line dyes have come into favor in some villages, and a variety of colors appears in the articles made by their weavers, but the vegetable dyes used by the ancestors are still employed by most of the women." The Tinguian women utilized the simpler way of producing dye out of *tayum*, where the leaves and branches of the plant were placed in water for a few days, then boiled with a little lime; it was into the liquid that the thread was later dipped.

The same author who has produced the most seminal ethnography on the Tinguian found that the neighboring Ilocanos down west, on the contrary, were increasingly using synthetic dyes, as he compared the weaving methods of said group with those of the Tinguian. Cole (1922:436) remarked that "The Christianized natives have less of the realistic, a greater variety of geometrical designs, and a greater fondness for bright colors, made possible by the use of an[i]line dyes, than the mountaineers."

Based on the cited literature, it may be surmised that the shift from the use of locally produced natural indigo dye to that of the commercial, synthetic *aniel* occurred at least in northwestern Luzon around the first quarter of the twentieth century. But it must also be stressed at this stage that while natural indigo dye production was already gone at around the second quarter of the twentieth century, cotton cultivation and household-based traditional cotton yarn production was still done until the 1950s, and until the early 1960s in remoter communities. As this yarn production existed in the Ilocos, local people kept on employing ways to dye some of their cotton thread. The shift in dye material, plus the continued desire to color thread, fathomably, also paved the way for the then sustained but changed function of the *baldi* in some sites—from *tayum* fermenting vats, into mere yarn dyeing vats. In this light, it is highly probable that the *aniel* in the *baldi* which in Agbalog's memory was used in dyeing the cotton yarn, could have been to some extent the locally produced one earlier on, and then the commercial synthetic *aniel* later on.

Cotton growing, eventually, likewise waned quite rapidly soon after, since the crop could no

longer hold its place in the fields of Ilocos due to the onslaught of new encroachments brought by the constantly advancing international market economy. The traditional production of cotton yarn in the region had largely stopped by the end of the 1950s. And while a few fields were still planted with cotton until the 1970s, the harvest was transported to Manila to be manufactured into thread. The death of traditional cotton yarn production and of the cotton industry in the Ilocos (and in the Philippines) was the result of the introduction of commercial yarn and increasing availability of factory-made textiles and clothing (Pertierra 1988). The introduction of the cash crop Virginia tobacco into the Ilocos in the early 1950s must also have dealt the final death blow to the cotton industry as well as marginalized other crops such as sugarcane (Ingel 2014).

Baldi uses beyond indigo dye production and yarn dyeing

The preceding discussion has shown that at least some of the *baldi* documented in this research were indeed used for producing natural indigo dye from the *tayum* plant. In particular, the more detailed information provided by Melanio Andino and Lourdes Rocero on the function of each *baldi* and other features in the vat assemblage in Barangay San Sebastian, San Vicente proves that said facility was intended for dye production. The same purpose could be attributed to the largest vat assemblage in Barangay An-annam, especially in accordance with the historical notes made by William Henry Scott.

The same discussion has also brought up that by around the end of the first quarter of the twentieth century, some of the *baldi* of Ilocos Sur were already being utilized for purposes other than for the processing of the *tayum* plant into indigo dye. The earlier-mentioned informants from Sinait, San Juan and Magsingal have for one shared that the *baldi* at least in their own places served as containers of natural dye or *aniel*-infused water in which cotton yarn was soaked to be colored. Bernard Vicente of Sinait added that this cotton yarn was what the old people wove into their clothes and blankets. It is

still common knowledge at least among the older folk in Ilocos rural/agricultural communities that locally produced cotton yarn served the home-based *abel-Iloko* industry.

For the later period between 1940 and the 1960s, significant information on other functions served by the *baldi* was provided by M.L. I. Ingel's mother, Lourdes Ibañez Ingel, who was born in Sinait in 1940. As a young child growing up in the barrios of Ricudo and Masadag (both in Sinait), Ingel participated in some stages of her family's home-based yarn production from their own cotton plants, and wove a little during her short visits to her hometown after she moved to Vigan in 1954. Ingel attested that she neither saw nor knew of any of her folk producing indigo dye or using the vats for yarn dyeing, even if they had both three units of *baldi* (not covered in the survey by Rabang-Alonzo *et al.* 2023) and *tayum* plants in the ancestral property in Ricudo which was very near the river. As far as she knew, they did not dye the cotton yarn that they made and wove; they kept their cotton yarn in the natural color, and thus, all the textiles that they wove through their looms were plainly off-white. Ingel however added that there were already colored *abel* fabrics that they could buy from the market, so it was these that they likewise sew besides the off-white textiles that they themselves wove. Beginning in the 1950s, colored yarn also became commercially available to weavers anyway.

Fermentation vessel for *sablot* leaves

Vicente heard from his old folk that some *baldi* were also used as vessels in which the leaves of the *sablot* (*Litsea glutinosa*) tree were submerged in water. Vicente does not know for how many days the said leaves were soaked for fermentation, but he explained that the resulting substance was utilized as binding paste that would be mixed with lime, sand and egg whites, so that the end product was "like cement" that was applied in construction (see also Esguerra 2013).

He recounted the oral history that his grandparents' generation passed on when he was a child. Every village in the town was responsible (or obliged?) for giving a certain contribution for the building of the Catholic church in Sinait.

Vicente's village, Sallacapo, was tasked to provide the lime that would be needed for the church's masonry, thus explaining the presence of traces of *nagapugán* (where lime was made, from *apog*, the Ilocano word for lime) on the ground in some areas in the village. The lime was put inside bags and brought to the church. The village produced lime not only for the church, but also for the construction of wells.

Some other villages were responsible for providing other materials for the church construction, like the *sablot* substance, and logs, from hard wood such as molave that people cut from the forest.

If Vicente's folk's accounts are true, by extension the use of the *baldi* in preparing the *sablot* binding material could be dated to as far back as the second half of the 1600s, when the church of the Santo Cristo Milagroso of Sinait was built.

Maguey rope production

Vicente moreover shared that some of the *baldi* in his town were utilized for producing ropes from the maguey plant. The maguey was likewise submerged in water, so that the plant would rot and its fibers could later be extracted and made into rope that people used for their own needs and for some livelihood.

Similarly, Alejandro Garcia related that the vats at the Quema-Crisologo facility at Barangay An-annam, Bantay were used for producing rope from the maguey plant, based on the oral account of his mother who was an employee there until around 1932. Apparently, by this time, the vats had been converted into this function from their earlier use for producing indigo dye.

Fermentation of *tayum* into fertilizers

In her childhood, Lourdes Ibañez Ingel witnessed two of their *baldi* that she described as "*nataytayag ngem tao*" (taller than a person), thus more than 1.5 meters high, being used as containers for the *tayum* leaves that were soaked in water to be fermented. The product served as fertilizers that were applied into their fields.

Leather curing

The third vat in Lourdes Ibañez Ingel's memory was about "*pagga't-tumeng*" (knee-high), thus

about half a meter tall. It was utilized in the curing of cattle skin to be made into leather. Her father, Liberato Isidro Dangcil Ingel (1909–1966), cured leather, fashioning most of it into machete-like knife sheaths that he sold.

According to Ingel, the *makorti a lalat* ("cattle skin to be cured and made into leather") that was earlier sliced off from the animal's flesh was later cut in such a way that one piece, when stretched, would fit the *baldi*. The cut pieces were spread, stretched, and secured in place at the bottom of the *baldi* by wooden stakes that were stuck into the edges, as well as by putting stones big enough over the splayed material, to make sure that the leather-to-be remained submerged inside the vat under the lime solution.

Days later, the hide was taken out of the *baldi* to be cleaned, thus removing whatever flesh remained. Then the material was again stuck into the bottom of the *baldi* through the same method. This time, it was soaked in water with the crushed bark of the *kamantiris* (*Pithecellobium dulce* (Roxb.) Benth.) so that the leather acquired its orangey-brown color.

Apart from the lime that they produced for their own needs, including for construction, Liberato Isidro and other village folk also made ropes out of the maguey plant for their own use, but the plant was simply dried sufficiently to facilitate the separation and collection of the fibers, which were afterwards twisted into ropes using a wooden implement. In this rope production, however, the *baldi* were not in any way used, unlike what Vicente and Garcia heard.

Vat dimensions and vat site features, vis-à-vis known functions

At this point, it is important to draw attention to some characteristics of the vats or vat assemblages that are identified as having been used for *tayum* fermentation.

First, it is most notable that indigo dye production necessitated the use of at least two vats, as observed by Coleman. Dr. Ramirez on the other hand shared that in the indigo production sites that she has seen in Mexico, three vats were used, which is the same as the number of vats in the San Sebastian site (if the small one that serves as catchment for drippings

is not included). It appears that compared to those of the pairs of vats described by Coleman, a relatively more sophisticated dye production was undertaken in the San Sebastian vat site—and most probably also in assemblages where there are more than two vats.

One of the vats was used for the first stage of fermentation wherein the *tayum* plant materials are submerged. Based on the observation of Coleman and the oral history regarding the San Sebastian, San Vicente site, one or more vats were used for the next stage/s where the liquid (*indican*) from the first vat was transferred. In the Ilocos Sur inventory (Rabang-Alonzo *et al.* 2023), 11 of the 13 sites where measurements were done have two or more vats each; six of these sites have two vats, while the others have four, five, 11 or 18 vats. (The possibility of vats having been demolished in sites where the documenters found only one existing vat could not also be discounted.)

Remarkably, just as Coleman had described it, the first vat utilized in the production stage was also higher (or on higher ground) than the next vat/s. Such difference in height is evident in at least eight of the 11 vat assemblage sites where the vats could be measured.

It can also be gleaned that the *baldi* that were used for producing dye out of *tayum* could be as high or as deep as 3.1 meters and could not be less than 1.3 meters high or deep. From Coleman's account, the indigo vats that he saw were 2–3 meters wide and also about as high or deep. The three bigger vats of the San Sebastian site, which is the only that could be directly pinpointed by informants as having been used for indigo production, are also wide, with the *kalakkian* being the narrower at 2.3 meters.

All of the vats in 11 vat assemblage sites where measurements could be done have yielded similar sizes, although in five of these sites, there are also vats that have existing heights/depths 1.1 meters and below. Meanwhile, the vats in each of the pairs of *baldi* in two vat assemblage sites in Saoang, San Juan, and in one vat assemblage site in San Ildefonso are uniform in size.

The attribute of wide vats can be understood from Dr. Ramirez's explanation that oxygen was needed in the fermentation process, so that the

indigotine (the organic compound derived from indigo) can be obtained. At the same time, Dr. Ramirez (online discussion with M.L. I. Ingel, 17 June 2018) commented that the vats covered in this research seem to be deeper than wider than those of the Mexican sites that she has seen, upon seeing the architectural plan drawn for the largest vat assemblage (An-annam site).

Informants who have related about yarn dyeing and leather production, on the other hand, seem to have seen shallower vats used for such purposes. This particularity is obvious—as deep vats were unnecessary and would have made the “harvesting” of yarn and leather difficult.

Whatever functions that the vats may have served, it must also be pointed out that the varying sizes and features of the vat assemblages covered in this documentation may likewise indicate varying scales of production. The smaller assemblages found across the towns were probably for subsistence production and domestic needs, while the big assemblages like that of the Quema-Crisologo families were intended for trade or commerce and thus transported outside the Ilocos region and/or exported outside the Philippines.

DISCUSSION

Two of the vat assemblages were used for producing dye from the *tayum* plant at least until the turn of the nineteenth century into the twentieth century, as shown by accounts and/or literature on the Barangay San Sebastian, San Vicente and Barangay An-annam, Bantay sites. Coleman (1915) noted the local importance of this industry:

While indigo constituted but a small part of the total exports of the Philippines as a whole, it was a great source of wealth for the Ilocano provinces and Vigan has a greater percentage of large, permanent buildings than the average Philippine town – buildings erected during the years when the industry was flourishing.

For its built heritage, today's much-celebrated ancestral houses, and for being “an exceptionally intact and well-preserved example of a European

trading town in East and South-East Asia,” the historic town of Vigan landed into the UNESCO list of World Heritage Sites in December 1999 (UNESCO 1999). The city has been reaping many other national and international recognitions since, including the brand as one of the New7Wonder Cities of the world in 2014. Until now, Vigan’s heritage serves as anchor for the development of the city, as well as contributes to the historico-cultural consciousness of people, including policy makers, across at least the Province of Ilocos Sur and the Ilocos region.

Other uses of the *baldi* noted down from key informant interviews can be listed chronologically: (1) for the fermentation of the leaves of the *sablot* tree, whose substance served as binding material for the lime plaster and mortar used for construction, such as of the church of Sinait in the second half of the seventeenth century; (2) as a container in which cotton yarn was soaked into natural dye or *aniel*-infused water for the purpose of coloring cotton yarn until about the second quarter of the twentieth century, at least for some vat sites in Sinait, San Juan and Magsingal; (3) for maguey rope production around the first quarter of the twentieth century until around the early 1930s in the Barangay An-annam site, and reportedly also in Sinait; (4) for the fermentation of *tayum* leaves wherein the product was used as fertilizer for the fields in a Barangay Ricudo, Sinait site not covered by the inventory; and (5) for the curing of cattle hides that were made into leather, also in the undocumented Barangay Ricudo site. The last two functions had been noted in said site until the 1960s.

It could be said that the *baldi* in the province have long outlived their purpose. What these served from the time of their construction in the colonial period, until about a decade or so after World War II, are unrecognizable to most people given their obvious out-of-placeness in today’s life. Whatever uses these cultural features have today, at best as water storage, lot boundaries or fences, or as garden/landscape elements, and the condition that these are left in, are currently too far off to be spoken as heritage.

The surviving *baldi* may be likened to extant pieces of the past that invite curiosity to the naturally curious, but their enduring presence is reduced by their physically neglected condition. Despite all, the vats seen in this initial inventory continue to stand, although many are very broken or overshadowed by vegetation or both (Rabang-Alonzo *et al.* 2023). These remain as if humans have refused to discard them notwithstanding their generally perceived physical irrelevance in the present time and space.

The remarkable absence of human intervention, until the present time, to totally get rid at least of the vats that hinder current movement or site development is itself a subject worthy of ethnographic probing. Are the vats seen in the light of family or community history and regarded with sentimentality? Are these anyhow accorded some indigenous spiritual dimension as in the case of water wells, whose local folklore includes superficial descriptions such as “most come in pairs” and “inhabited by spirits”? This stage of the study has not allowed sufficient resources to go deeply into the cultural aspect of the *baldi*, but future research should not miss including an inquiry on folklore surrounding the vat sites and this absence of human intervention on the same. Such investigation may prove to be equally valuable in unearthing the cultural history, as well as in generating community-based protection, of this tangible heritage.

It is hoped that this just concluded initial research on the stone/brick-and-lime vats in some northern towns of Ilocos Sur is only an opening for further work. Future historical archaeological research on the vats may include:

- A) Research on archival records that pertain to vat construction and functions, indigo, *sablot* paste, and maguey rope production, yarn dyeing, and leather craft from the Spanish contact period through the post WWII era;
- B) Ethnographic research, such as through key informant interviews with old and other knowledgeable community people and scholars, to pursue site-specific and broad-ranging inquiry on related topics,

such as those previously mentioned in the proposed archival records research. This research should also include those that pertain to folklore surrounding the history of ownership and functions of the *baldi* and the reason why these had been kept (not demolished) through the decades;

C) Conduct of relevant ethno-historical and archaeological studies on selected vat sites that would enable the following, among others:

- Dating of the vats and/or vat sites through appropriate absolute dating methods (if possible), and/or relative dating through associated artifacts and other archaeological materials;
- Establishment of the history of ownership and human activities utilizing the vats or around the vat sites; and
- Identification of plant (and even animal) species that have been processed in said old containers by archaeological residue analysis.

These studies may be pursued in partnership with the provincial and municipal governments, with the University of the Philippines and the National Museum of the Philippines, especially in line with the Ilocos Sur Archaeological Project that was initiated by the Provincial Government of Ilocos Sur and conducted by a team of archaeologists from the University of the Philippines Diliman Archaeological Studies Program and the National Museum of the Philippines in 2011 and 2012. In the end, this project should at the very least lead both to the protection of the vats and vat sites and to the production of literature that would help build and promote knowledge on the history and culture of the province and region.

CONCLUSION

The stone/brick-and-lime vats found across Ilocos Sur province (including those not covered by Rabang-Alonzo *et al.* 2023) may well have played a significant part in the life of the local people at the time these were in use. The indigo industry, and other lower-scale production

activities undertaken in the vats, are at present very much forgotten pieces of the past, but contributed to the prosperity of the Ilocos and have left an enduring legacy.

Our several recommendations for future directions include emphasizing protection of the vats, potentials for further study and continuation of their documentation in other towns of Ilocos Sur. Further recommendations include enriching the inquiry through in-depth and multi-faceted investigation to build a body of literature and by promoting awareness of the cultural history of the province of Ilocos Sur, and more broadly, of the Ilocos region. All these actions are aimed towards planning for the protection and conservation of the vats as a significant part of our local tangible cultural heritage.

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REFERENCES

- Allegre, E. (ed). 1998. *Meeting at the Marketplace*. Volume 2. New York and Hong Kong: Asia Publishing Company Limited (Reader's Digest).
- Arellano Law Foundation. 1899. Constitution of the Republic of the Philippines (Malolos Convention). In *The LAWPHiL Project*. Retrieved on July 11, 2018 from <https://www.lawphil.net/consti/consmalo.html>.
- Bourne, E.G. 1903/1973. Historical introduction. In E.H. Blair (ed.), *The Philippine Islands, 1493-1803*, Volume I, p. 42. Mandaluyong, Rizal (Manila): Cachos Hermanos, Inc.
- Canilao, M.A.P. 2011. *Of Gold, Spanish Conquistadors, & Ibaloi Generational Memory*. Baguio City: University of the Philippines Baguio – Cordillera Studies Center.
- Canilao, M.A.P. 2015. *Mountains and Sea: Case Studies in Coastal, Riverine, and Upland Archaeology of Ilocos Sur*. Manila: University of Santo Tomas Publishing House.
- Cole, F.C. 1922. *The Tinguian (Social, Religious, and Economic Life of a Philippine Tribe)*. Publication 209, Anthropological Series, Vol. XIV, No. 2. Chicago, IL: Field Museum of Natural History.
- Coleman, J.H. 1915. The indigo industry of Ilocos Sur. *The Philippine Craftsman* 4:404–406. Manila: Bureau of Education; National Commission for Culture and the Arts.
- Cortes, R.M. 1975. *Pangasinan, 1572-1800*. Quezon City: New Day Publishers.
- Co's Digital Flora of the Philippines. n.d. Retrieved on 12 June 2023 from <https://www.philippineplants.org/>.
- Dizon, E. 2003. Underwater and maritime archaeology in the Philippines. *Philippine Quarterly of Culture and Society* 31:1–25.
- Dizon, E. 2004. The Role of the Philippines as an Entrepot during the 12th-15th Century's Chinese and Southeast Asian Trade Network. Paper presented at the Chinese Export Ceramics and Maritime Trade 12th to 15th c, Chinese Civilisation Centre, City University of Hong Kong.
- Esguerra, N.A. 2013. Sablot (*Litsea glutinosa*), Lour Rob., a symbol of Ilocano ingenuity in construction. *UNP Research Journal* 22(1), January-December 2013. Vigan: University of Northern Philippines.
- General Appropriations Act of the Philippines. n.d. General Provisions.
- Ingel, M.L. I. 2014. Of incessant spirits and the *basi* of the Ilocos. In I. Manalo (ed.), *Conscripción: Imagining and Inscribing the Ilocano World*. Manila: National Archives of the Philippines.
- National Historical Commission. 2014. Stone marker on Isabelo Abaya.
- Pastor-Roces, M. 1991. *Sinaunang Habi, Philippine Ancestral Weave*. Pasay City: Nikki Books.
- Pertierra, R. 1988. *Religion, Politics, and Rationality in a Philippine Community*. Quezon City: Ateneo de Manila University Press.
- Rabang-Alonzo, F.N.A., U.A. Pacada, G.A. Retuta, R.B. Navarro and M.L. I. Ingel. 2023. Initial inventory and documentation of stone/brick-and-lime vats (*baldi*) in some northern towns of the province of Ilocos Sur. *Journal of Indo-Pacific Archaeology* 47:18–52.
- Respicio, N.A. 2010. *Karit iti Sangkailian: Challenges to the Abel Iloco Tradition*. In N.A. Respicio, M.L. I. Ingel and J.J.C. Ligerio (ed.), *Tawid, The Living Treasures of Ilocos Sur*. Manila: Sanicua Publications.

- Respicio, N.A. 2014. *Journey of a Thousand Shuttles, The Philippine Weave*. Manila: National Commission for Culture and the Arts.
- Scott, W.H. 1986. *Ilocano Responses to American Aggression*. Quezon City: New Day Publishers.
- Stuart Exchange. 2016. Philippine Medicinal Plants: Tayum. Retrieved on June 14, 2018 from <http://www.stuartxchange.org/Tayum.html>.
- UNESCO. 1972. Convention Concerning the Protection of the World Cultural and Natural Heritage. Retrieved on June 13, 2022 from <https://www.refworld.org/docid/4042287a4.html>.
- UNESCO. 1999. Historic City of Vigan. Retrieved on July 11, 2018 from <https://whc.unesco.org/en/list/502>.