Charting the Abra gold trade network of Northwestern Luzon using ethnohistorical archaeology and WorldView-3 satellite imagery

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Abstract

The paper will look at the Abra Network from the Early Historical to Historical Period (10th to Early 20th c) which encompasses areas of Ilocos Sur as well as the whole province of Abra. It is argued that this particular network features the migration by coastal peoples to the interior in order to fully control strategic “choke” points in the gold trade with the Lepanto and Angaqui networks as well as to control jump-off points to the leeward side of the Cordillera Mountains-- the Cagayan valley. Analysis was done using data from GIS predictive modelling and WorldView3 satellite remote sensing, in conjunction with archaeological data from 2011 and 2012 field seasons as well as published primary and secondary ethnohistorical data. Several Spanish period maps provided important data on early settlements and trails, after georeferencing through GIS software.

Introduction

This paper is the concluding case study in a series that looks at five gold trade networks in Northwestern Luzon, Philippines (Fig.1). Based on ethnohistorical records, the crown jewel of
the Abra network is its massive riverine network measuring 120 kilometers from coast to mines as well as its intervening network of trails and footpaths that facilitated upland-lowland exchanges, with the apex coastal settlement emerging at the Vigan-Caoayan-Bantay area and the apex bulking village at the river bend at the Bangued-Tayum-Bucao-Lagang-ilang area (Fig. 2)(Fig. 3). This distinctive geographic feature may have facilitated the establishment of a more permanent gold trade network, in stark contrast to the evanescent to semi-permanent markets in the other Northwestern Luzon networks I, IIA, IIB, III that were investigated in the past four case studies.

In contrast to the four other regions dealt with in the case studies, the present one is fortunate to have available the more advanced WorldView3 satellite imagery which features a spatial resolution of 1.24 meters for multispectral and 0.31 meter for panchromatic compared to the WorldView2 imagery, which is 1.85 meters for multispectral and at 0.46 meter for panchromatic (DigitalGobe 2014, 2013). As will be shown below, the WorldView3 data will be of immense utility in remote sensing/detecting segments of the early intra-Abra trails/routes as well as the linkage between the Cagayan Valley and the Ilocos coast, including the location of associated structures and settlements. Interestingly, the archived satellite imagery of the Abra Network was taken when the WorldView-3 satellite was newly launched into space in 2014.

The paper will first discuss the seafaring tradition and then the gold culture in the Abra network. The relevant settlements in the Abra network are then discussed looking at both the coastal and interior settlements. GIS and remote sensing analysis is then carried out in the last section.

Seaborne Trade
Dizon has argued that trade and culture contact between the Philippine archipelago and the Southeast Asian neighboring countries including China, Japan, India, and other Arabian nations started 9th to 10th c and intensified between 12th to 15th c (2004:1). Products including interior raw materials including gold was bartered as a means towards accumulating exotic prestige goods (see Junker 1999 on Philippine prestige goods) notably trade ceramics, and trade beads among others. Laufer who analyzed the Abra trade ceramic data of Fay-Cooper Cole argues for dates as early as Sung dynasty (10th to 13th c) (Laufer in Cole 1922: 17).

According to Morga, Vigan is one of the major port locations in Luzon,

On the coasts of Pangasinan, Ylocos, and Cagayan there are some ports and bars, where ships can enter and remain, such as the harbor in Marihuma, the port El frayle, that of Bolinao, the bar of Pangasinan, that of [V]igan, the bar of Camalayuga, at the mouth of the Tajo River (which goes up two leguas to the chief settlement of Cagayan) besides other rivers, bars, harbors, and shelters of less account for smaller vessels throughout the coast of this island (Morga 1609: 109)

Keesing argues that at its zenith, Vigan was very prosperous because of the gold trade (1962: 126), this however appears to have collapsed upon Spanish contact, in fact a Spanish chronicler laments,

The town of Fernandina [old name of Vigan] in the province of Ilocos has proved to be so unhealthy a region, that from being the richest town in these islands, it has now only a few inhabitants with no organized cabildo or government (Unsigned 1582-1583: 203)
At this juncture, it is good to look at accounts showing that the Tingguian/ Itnegs have a seafaring tradition in the past prior to migrating to the Abra interiros. Sande for instance states,

> They do not understand any kind of work, unless it be to do something actually necessary- such as to build their houses, which re made of stakes after their fashion; to fish, according to their method; *to row, and perform the duties of the sailors*; and to cultivate the land. The mountaineers make iron lance points, daggers, and certain small tools used in transplanting rice. They are very anxious to possess artillery, of which they cast a little, although but poorly. Sande 1576: 69 (author’s emphasis)

One important “incidental intelligence” (Scott 1982) here is the fact that Tinguian/ Itnegs are good rowers. Rowing implies sea navigation since riverine navigation (i.e. in the Abra River) is carried out on rafts and involves shoving forward using bamboo poles as well as ropes for pulling alongside the river banks (Fig. 4). In another account, Antonio de Morga talks about the sea crossing Biray that was probably the vessel rowed by Tingguian/ Itnegs and their Ilocano kin,

> … they time their rowing to the accompaniment of some who sing in their language refrains by which they understand whether to hasten or retard their rowing (Morga 1609:82)

He expounds in a footnote:

> A common device among barbarous and semi-civilized peoples [sic] and even among boatmen in general. These songs often contain many interesting and important bits of history, as well as of legendary lore (Morga 1609:82)
Therefore it is important to highlight the fact that the Tingguian/ Itneg though presently situated in the Abra River valley in the interior, share with their Ilocano kin traditions for sea-faring.
Figure 1 Five case studies in Northwestern Luzon; terminal case study 5 in purple polygon (ASTER GDEM is a product of METI and NASA)
Figure 2. Case Study settlements overlain on hillshade raster based on Digital Elevation Model (ASTER GDEM is a product of METI and NASA).

Figure 3. Composite photo. Top left, northerly view from San Quintin with Abra River on foreground, Langiden with Bulagao mountains on background. Top right, northeasterly view from Bangued with Abra River on foreground, Dolores-San Juan-La-Paz-Danglas area in the background. Bottom left, Southeasterly View from Bangued with Abra River on foreground, Tayum on the background, Lagang-ilang-Salapaddan mountains over the horizon. Bottom right, easterly view from Tayum with Lagang-ilang-Licuan-Baay-Lacub-Malibcong area on the background (photos by author 2018).
Early Gold

At this juncture we examine the gold culture among the Tingguian/Integ populations of Abra. It is argued that gold was both a backbone to trade as well as an aesthetic marker of status. Keesing argues that the Tingguian/Integ was a far more complex society compared to its neighbors in the interiors,

Leadership is provided by wealthy headmen or aristocrats. Ceremonial wealth in the form of Chinese jars, copper gongs, and precious beads vies with rice fields and livestock in defining the status of being rich. Ritual and festival life is highly elaborated, with female shamans or mediums taking important responsibilities in religious affairs.

(1962: 121)(author’s emphasis).

Cole notes the prevalence of Chinese ceramics among the Tingguian/Integ pointing out that sampans from China (conversely Birays from Luzon) may have regularly visited the archipelago for trade (Cole 1912). This accumulation is so important for the Tingguian/Integ of Abra because quantity of jars sourced from trade directly correlated with status (1912:12).

Cole adds that these exotic prestige goods were handed down from generation to generation having taken life (agency) of their own as “they began to gather to themselves stories of wondrous origins and deed, until to-day certain jars have reputations which extend far beyond the limits of the tribes by which they may be owned” (Cole 1912: 12). Each jar even has a name (p13) citing as an example Magsawi from the Abra Tingguian/Integ,

It was credited with the ability to talk; sometimes went on long journeys by itself; and was married to a female jar owned by the Tingguian of Ilocos Norte. A small jar at San
Quintin, Abra was said to be the child of this union and partook of many qualities of their parents (Cole 1912:12).

What is really interesting is that although this jar was sourced from the coast via trade from an early period and handed down to the owner Cabildo of Domayco as heirloom, a putative oral history begins to take shape from the perspective of this owner,

Magsawi, my jar, when it was not yet broken talked softly, but now its lines are broken, and the low tones are insufficient for us to understand. The jar was not made where the Chinese are, but belongs to the spirits of Kabonian, because my father and grandfather, from whom I inherited it, said that in the first times they (the Tinguian) hunted Magsawi on the mountains and the wooded hills. My ancestors thought that their dog has brought a deer to bay (which he was catching), and they hurried to assist it. They saw the jar and tried to catch it but were unable; sometimes it disappeared, sometimes it appeared again to the wooded hill on their way to town. Then they heard a voice speaking words which they understood, but they could see no man. The words it spoke were: ‘you secure a pig, a sow without young, and take its blood, so that you may catch the jar which your dog pursued.’ They obeyed and went to secure the blood. The dog again brought to bay the jar which belonged to Kabonian (a spirit). They plainly saw the jar go through a hole in the rock which is a cave, and there it was cornered so that they captured the jar which is Magsawi, which I inherited (Cabildo of Domayco interviewed by FayCopper Cole 1912:12-13)

That the jar Magsawi was claimed as non-Chinese is explained by Laufer Berthold as the by-product of the vertical transfer of the jar over several generations, so much so that a belief...
catalyzed that the jar was “never been made by the Chinese but by the spirits” (Laufer postscript in Cole 1912: 18). Apart from the jars, porcelain plates also figure among the Tingguian/Itneg and Cole notes that they are owned by mediums who used them for summoning spirits (1912:15). These plates are never sold during the lifetime of the medium, only upon death and there is an aspirant that is being groomed to take-over the position (1912:15). Cole describes how the porcelain is used to induce a trance:

> When about to call a spirit into her body, the medium sets herself in front of the spirit mat, and covering her face with her hands, she trembles violently, meanwhile chanting or wailing songs in which she bids the spirits to come and possess her. From time to time she pauses and holding a plate on the fingertips of her left hand, she strikes it with a string of sea shells or a bit of lead, in order that the bell-like sound may attract attention of the spirits. Suddenly a spirit takes possession of her body and then as a human the superior being talks with the mortals. (Cole 1912:15)

Not only did trade ceramics function as status markers and spiritual vessels, according to Cole they were also given as covenants to settle inter-tribal and inter-village disputes and feuds, at times even used to compensate the kin of a person whose head was taken by a hunting party (1912: 15). For instance Cole mentioned that a village was able to reach a peace settlement with another village by offering eleven jars in exchange for the eleven heads taken during the intertribal war (ibid).

While the volume of trade ceramics that entered the Abra network may hold as testament to the amount of gold traded in exchange, gold was also a central metal in the social and spiritual lives of the Tingguian/Itneg. Some primary and secondary historical works talk about
Tingguian/ Itneg gold display. Paul Frost Gironiere was a French traveler who was able to document the life and ways of the Tingguian/ Itneg. According to Gironiere,

Their heads were ornamented with pearls, coral beads, and pieces of gold, twisted among their hair; the upper parts of their hands were painted in blue; their wrists adorned with interwoven bracelets, spangled with glass beads- these bracelets reached the elbow, and formed a kind of half plaited sleeve (Gironiere 1854: 108-109) (author’s emphasis)

Cole also talks about gold headbands being worn by men to keep long hairs in place, sometimes each hair is also adorned with golden beads, ears and finger rings were also made of gold (Cole 1915: 9). Even spirits are said to be surrounded with articles of gold apart from the ubiquitous trade ceramics in their spirit houses (ibid). Cole argues that,

The use of gold and jewels seems to have been common in the old times; the latter are seldom seen in the district today, but the use of bits of gold in the various ceremonies is still common, while earrings of gold and copper are among the most prized possession of the women. Placer mining is well known to the Igorots of the south [Angaqui and Lepanto], who melt and cast the metal into various ornaments (1915: 21)

He explains later that the gold comes from the mines in the interior (Cole 1912: 241). In another work (Cole 1915) he discusses how feasting has become intertwined with gold. When invitations to ceremonies or celebrations are sent out to guests they are in the form of betelnuts covered with gold oiled over (1915: 18-19, 24, 31) a form of magic. According to Cole this is still seen today when gold is sent out as a gift to a friend in another town as a form of invitation (1915: 24)
He then talks about the development of a prestige economy as gold was traded overseas for porcelain jars from China and Annam (Vietnam),

It is evident that outside influences of great importance were introduced at a period later than the time when the Chinese first began to trade along the coasts of the Philippines for the prized jars, which play such an important role in mythology, are not to be identified as those of native make but are ancient Chinese vessels dating back at least to the fourteenth and perhaps even to the tenth century (Cole 1915: 31)(author’s emphasis)

The Tingguian/Itneg trade network spanned as far to the Indian Ocean with agate and carnelian beads being exchanged for gold. In fact, Cole states that the Itneds “glass, porcelain, and agate beads, which are second only to the jars in importance, are exceedingly old” (Cole 1915: 31)

Cole then talks about how gold is intertwined with the spiritual world. In a Tingguian/Itneg ritual ceremony called Ngorong-or for a person seriously ill with stomach trouble gold is mixed with pig liver and brain and buried beside the center post of the dwelling (Cole 1912: 326). In another ritual gold together with agate is placed around the neck and legs of a sacrificial pig (Cole 1912: 351). When reenacting good spirits Iwaganan and Gimbagon, they hold in their hands pieces of gold (356). Cole concludes that,

for the most part, the life, customs, and beliefs which appear in our reconstruction of ‘the first times’ agree closely with present conditions; certain things which seem formerly of prime importance- such as the sending of a betel-nut covered with gold to invited guests to a festival or ceremony- appear to have their echo in present conditions. The betel nut which played such a momentous part in the old times still holds its place in the rituals of the many ceremonies, although it is not now much used in daily life (1915: 31)
According to Salvador-Amores, photo-documentation serves as proxy to visual or written records of the indigenous groups, which are [in some instances] unavailable (2016: 56). Cole and Worcester archival photos indeed show some aspects of gold working and use as well as the ceremonial and spiritual importance of ceramics/jars for the Tingguian/Itneg. Photos of smithy’s (Fig. 5) are found in these photographic collections. The rudimentary elements of these smithy’s include a piston blower, various cobbles for crushing ore or hammering as well as crucibles and other clay conduits. These implements are used not only in iron working but also gold working.

At this juncture we look at the early settlement locations that are relevant to the analysis.

Coastal Port Settlements

In contrast to the four other case studies of gold trade networks that were analyzed (Canilao 2017a, 2017b, 2017c, 2017d), the Abra network seems to have supported a more permanent market encounter in the coast specifically at the Vigan-Caoayan-Bantay area. This may have been the case as afforded by the Abra River in facilitating bigger bulk exchanges between coast and the bulking stations along Abra and eventually the interior gold mining settlements of the Angaqui and Lepanto networks. Settlements upriver in Lagang-ilang, Bangued-Tayum, Bucao where cogs in a wheel that facilitated higher bulk exchanges towards the coast. Larger riverine rafts plying the lower and middle Abra facilitated the riverine transport towards Vigan-Caoayan-Bantay. There is also a well-established maritime trade industry that has ships even sailing to the mainland Southeast Asia and the East Asia--the Biray which is a local version of the vessel called Sampan in Dai Viet and Southern China (Fig. 6).
What is interesting however is the fact that despite the existence of this more formal market system which probably was at its zenith in the 16th c, there emerged alternative routes and trails that facilitated shipment and movement of gold in lesser amounts. This may be the case with the trails leading to Santa Maria, Narvaca, Cabugao/ San Juan, Magsingal, Sinait/ Calanutian from the Abra interiors.

At this juncture it is important to note that based on the data from Juan de Salcedo and Martin de Goiti’s expedition in 1574 there were up to 950 houses in the Sinait/ Calanutian Luzodan area with 535 tahels of gold being taken (Newson 2009: 182). Keesing however reports that based on an Encomienda Report dated 1591 both Cabugao and Sinait had a combined tribute of 1,000 tahels with a population of 4,000 (1962: 142). Magsingal and Sanguian (San Juan) had 1005 houses with 341 tahels of gold exacted (ibid). Vigan had 1015 houses with 615 tahels of gold exacted (ibid). Bantay and Bantaybuey had 400 houses and 136 tahels of gold exacted. Here we see that Vigan has a denser population at contact. Note that the Spanish-Philippines tahel is equivalent to 39.537 grams (see Reyes 2007: 57), thus the Sinait tribute alone is 21,152.295 grams of gold (21.15 kilos of gold).

Sinait/ Calanutian

Salcedo made Sinait one of his encomiendas because of the richness and fertility of the land (Foronda and Foronda 1972: 30). The name of the town was derived from sinnait which means to challenge one another. It was allegedly a venue where olden duels were settled, often violently (1972: 63).

Sinait was part of a cluster of settlements that included Badoc to the north and Calanutian to its south. Calanutian is one of the early villages that figures in the oral tradition Biag ni
Lam’ang. Calanutian is the hometown of Ines Kanoyan, the wife of Lam-ang (Yabes 1958: 309).

At contact with Juan de Salcedo and Martin de Goiti in 1574 expedition there were 950 houses in Sinait, 100 of which are in Calanutian.

It can be argued that Sinait/ Calanutian stands out among the competitors of Vigan, based on the amount of gold exacted at Spanish contact. The amount of gold available in Calanutian (exact by the Juan de Salcedo) seems at a level comparable to Vigan. This anomaly may be explained by the possibility that this particular settlement was getting their steady supply of gold via the overland trail.

Excavation at Calanutian site (see Fig. 7, 8) has revealed a relative date of as early as the 12th c. There are whole pieces as well as sherds of Vietnamese tradeware ceramics dating to 15th c, 12th c Chinese coins were also excavated. This settlement was clearly a trade hub given the exotic artifacts found within the excavation units, including carnelian and Asian beads, various Asian ceramics, and gold in the context of dental modification and grave provisioning (Fig 9).

Cabugao- San Juan

Based on a 1591 Spanish holdings document, Cabugao- San Juan was a source for tributes (Keesing 1962 123-124). Cabugao- San Juan though separate towns in contemporary times may have been part of another cluster of settlements that included the Salomague port (see Keesing 1962: 133) on the coast, the Nagsingcaoan gateway location and the Refaro Ijang (discussed below).
Nagsinacaoan settlement was a gate location for the Cabugao trail that crosses through the Cordillera mountains (Fig 10, Fig 11). This gateway location would have been an important conduit for interior products moving to the Sinait, Cabugao, San Juan, Magsingal area since Vigan has a permanent control of the Abra River. The pre 16th c prominence of Calanutian (mentioned above) for instance can be attributed to interior products passing through the gateway.

In 2012 archaeological transect surveys were carried out at a hill lying south of the Barangay center adjacent to the present cemetery area. The survey resulted to the collection of several surface finds of earthenware and trade ceramic sherds leading to the designation of the site as Nagsincaoan-Bumatay site. The team also carried out a transect survey at Sitio Naguilian at the entry point to the Cordillera trail. The literal translation of Naguilian is a place where the village was established. The site is close to the Cabugao river and is seemingly in the montane gates of the interiors to the east. A transect survey was conducted by the team and true enough, some earthenware and trade ceramic sherds surface finds were collected at this Nagsingcaoan-Naguillian site.

Excavations were also carried out at Nagsincaoan Kakadiran Reba Elementary School in Nagsincaoan because of surface finds including a pipe and some ceramic sherds. The hill Southeast of the school site also had a cranial fragment on the surface. Three 1 x 1 test pits were excavated up to 1.5 to 2 meters below surface to investigate the occurrence of surface artifacts. No buried artifacts were recovered in the underlying sediments indicating that the surface artifacts may have been in a disturbed context (perhaps from nearby areas).
Associated to the Cabugao site is the Valyador Site (Fig 12, Fig 13) in Refaro, San Juan, which appears to be an Ilian or Ijang or hillforth refuge/ defense (for early references see Dizon and Santiago 1995, 1994). A scatter of earthenware and trade ceramic sherds was documented during an archaeological transect survey in 2011. In 2012 three one by one meter test pits were also excavated but with no buried artifacts. The surface ceramics may have also been in a disturbed context.

**Interior Settlements- Bulking Stations, Jump-off Points**

Several Spanish period maps provide the locations of settlements in Abra (for example see Fig 14, Fig. 15) with some Spanish period maps showing trails connecting them (Fig. 16, Fig 17). Although these maps are not at scale, it is possible to use GIS georeferencing methods to manipulate the maps to improve its scalar accuracy (below).

Abra itself is the convergence point of different river systems including the Tineg, Danglas (Suut), Parsuguan, Malanas, Baay and the massive Abra River that drains the triboundary of Ilocos Sur, Abra, and Mountain Province. Thus this convergence of riverine systems make the Abra river valley quite fertile, which is in stark contrast to the hills of the province that are dry to arid because they are located on the leeward side of the Bulagao chain of mountains which forms a north- south wall. The fertile river valleys would have supported some amount of wet rice agriculture but more importantly the river systems facilitated bulk exchanges upriver and downriver. The rivers would also be important because these drain some lode deposits in the interior thus making placer mining possible.

In contrast to the bulking stations of the other four networks, the Abra bulking stations notably the settlements of Bangued/ Tayum, Bucao, and Lagang- Ilang may have epitomized a
bulking station that has full interface into the gold trade plying the Abra River. Interestingly, while Tineg settlement farther in the interior is regarded as the origin place of the Itneg-Tingguian/Itneg group (itneg means ‘of Tineg’), the emergence of this settlement may be linked to the opening of communications, trade and exchange with the Cagayan valley to the East, a route cutting through the Cordillera mountains, specifically linking up with the settlement of Malague (also called Malaueg which is present-day Rizal in Cagayan Province). Thus Tineg can be described as a jump-off point, but it should be mentioned that the area is also endowed with gold deposits based on the georeferenced mineral resources map (below).

**GIS Predictive Modelling, Remote Sensing**

At this juncture we focus on the GIS and remote sensing method that is a complementary method to ethnohistorical archaeology. The first step was to create a working basemap for the Abra network. This was carried out using ERDAS Imagine 2016 (Hexagon Geospatial- Madison AL, USA) by mosaicking and georeferencing 1:50,000 topographic maps from the National Mapping and Resource Information Authority website. The next step was to georeference all five available historical maps that provide information on the Abra settlements as well as trail connections using ArcMap 10.5 (ESRI- Redlands CA, USA). The resulting georeferenced maps with georeferenced settlements and trails are presented as Figures 18, 19, 20, 21, and 22. Of the five historical maps, four contained information on intra-Abra trails and were then digitally traced and overlain on the WorldView 3 satellite imagery in preparation for remote sensing.

At this juncture, it is important to state that unlike the other case studies in Northwestern Luzon there are little to no historical records and accounts that indicate where early gold mining in Abra is carried out. What is available is a small section of the Mineral Resources Map of the
Cordillera Autonomous Region (Mineral Lands and Topographic Survey Section, Mine Management Division, Mines and Geosciences Bureau), which include a plot of explored and developed mines in Abra. The map was a relatively small-scale map and needed some georeferencing (Fig. 23). After georeferncing this mineral resource map, the next step was to digitize these explored and developed mines in GIS and to also overlay these on the WorldView-3 satellite imagery in preparation for remote sensing.

The corresponding ASTER global digital elevation model (ASTER-GDEM product of METI and NASA) was downloaded using the Global Data Explorer tool (United Stated Geological Survey, Department of the Interior). This raster dataset was used in running least cost path predictive modelling from the digitized settlements. The output raster map was then digitized into trail polylines that were overlain on the digital elevation model (Fig. 24). Remote sensing was then carried out on the WorldView 3 satellite Imagery using the digitized features as guides.

As with the other case studies in Northwestern Luzon, this case study follows the middle-range theory in archaeology, which proposes that human behavior in the past will be manifested in some way in the modern landscape. Thus it is safe to argue that segments of extant/ancient trails may still be in use today, linking contemporary settlements (in some cases old settlements whose place names have changed over time). Thus instances wherein the present day articulation of roads and trails coincide with the ethnohistorical model or the GIS model is in itself an interesting remote sensing result but can be further investigated through archaeological excavation. It can also be argued further that old/ancient paths have given way (evolved) to horse trails and eventually roads that are at least single lane. Ferguson, Berlin and
Kuwanwisiwma (2009) argue that ancient trails may integrate pedestrian trails, pack animal routes, wagon roads, and modern unpaved roads overtime, a case they noted among the Hopi of the Southwestern United States (p. 34). In this Hopi transportation network, trails and roads overlaid one another over time (p. 40). They cite the case of Arizona State Route 264 (p. 26) as an example.

That we know for a fact that old trails and routes in Abra existed in the past that can be retraced is something mentioned in some historical sources. For instance, Keesing states that, Until the development of modern roading, a day’s journey by raft or horseback was required to get from the coastal area through this gorge [Banauang Gap] into the open river flats of the Abra valley. 1962:119

Later he explains that, Trails lead by way of some of their headwater streams into Lepanto, Kalinga, and Apayao. They also cross from the middle Abra valley westward to the coast at Narvacan and other points, and form North Abra into Ilocos Norte (119)

With regards to the Cabugao/ Calanutian-Tineg- Malague trail a total of three trail segments were remote sensed (see Fig 25,26,27). Figure 25 is particularly interesting as it shows a portion of the trail that was cut later on by a contemporary road. Yet the old trail follows both the Galvey georeferenced and digitized trail and the Tineg to Calanutian least cost path. Figure 26 shows a segment of contemporary road that is parallel to the Malague to Tayum and Tineg to Calanutian least cost paths. Figure 27; on the other hand, shows traces of a trail parallel to the Tineg to Cabugao and Malague to Cabugao trail.
With regards to the Bangued/Tayum- Tineg- Malague trail which was followed by Guillermo Galvey a total of two (Fig 28, 29) were remote sensed. Figure 28 is interesting because it shows contemporary trails parallel to both the Galvey trail and the Tineg to Tayum and Malague to Tayum least cost path. Figure 29 shows a contemporary trail that is parallel to the Malague to Tayum least cost path.

With regards to the routes from Bangued/Tayum, Bucao to Narvacan a total of three (Fig 30, 31, 32) were remote sensed. Figure 30 shows some contemporary roads parallel to the Bucao to Narvacan trail. Figure 31 shows some contemporary roads parallel to the Pennarubia georeferenced and digitized trail. Figure 32 shows some contemporary roads parallel to the 1794 trail.
Figure 4 Composite archival photo of raft plying the river: top photo shows navigation upstream Abra River via pulling ropes (© The Field Museum, CSA 24619. Photographer: D.C. Worcester), bottom photo shows navigation downstream using poles-shooting the rapids (© The Field Museum, CSA 24697. Photographer: D.C. Worcester).
Figure 5 Composite archival photos of smithys somewhere in the Abra network: note bamboo piston forge and other implements (top photo © The Field Museum, CSA 29144. Photographer: Fay-Cooper Cole; bottom photo © The Field Museum, CSA 21979. Photographer: D.C. Worcester)
Figure 6 Pandan in Vigan-Caoayan arrow shows where a Biray vessel (based on local oral histories, the boat may be between 80 to 150 years old) is buried under brackish sediments (Using WV3 bathymetry combination, green-blue-coastal blue) (DigitalGlobe Foundation)
Figure 7 arrow showing Calanuit site, which was excavated during the Ilocos Sur Archaeological Project of 2011 and 2012 (Using WV3 soils and construction combination, red-blue-yellow) (DigitalGlobe Foundation)
Figure 8 Calanitian Site Map (Illustrated by Eduardo Bersamira 2012-Ilocos Sur Archaeology Project II)
Figure 9 Various artifacts excavated in Calanitian; upper left, Gold and evidence for tooth pegging; lower left, Chinese coins dated to 12th c; lower right, various Asian trade beads; center piece is an illustration of Context 259 a 12-14 yo female buried with grave goods including gold, beads, tradeware and earthenware (after Illustration by Eduardo Bersamira 2012-Ilocos Sur Archaeology Project II)(artifact photos by author 2011, 2012) compare artifacts with ornaments seen in archival photo showing a Danglas Tingguian girl from elite class with arm beads interspersed with solid gold as well as four centuries- old coins inserted in neck beads (after © The Field Museum, CSA 19296. Photographer: D.C. Worcester)
Figure 10 Arrow showing sites in Nagsingcaoan, Cabugao (Using WV3 soils and construction combination, red-blue-yellow) (DigitalGlobe Foundation)
Figure 11 easterly view from the Nagsingcaoan gateway, trail segments were remote sensed on the ridge in the center—see figure 26 (photo by author 2012)
Figure 12 encircled in yellow is Ijang in Refaro, San Juan where tradeware was found on the surface (Using WV3 soils and construction combination, red-blue-yellow) (DigitalGlobe Foundation)
Figure 13 Clearing in Refaro with tradeware surface finds (photo by author 2012)
Figure 14 Mapa Geografico del Centro de la Abra en la Provincia de Ylocos. Unknown Cartographer, Undated (Courtesy of the National Archives of the Philippines)
Figure 15 Plano Topográfico que comprende una parte de la Provincia de Ylocos Sur, en la que se hallan situados los Distritos Militares de Tinguianes e Ygorrote. Unknown cartographer, Undated (Courtesy of the National Archives of the Philippines)
Final Author Version. Journal of Archaeological Science: Reports 19 (2018) 357–396. https://doi.org/10.1016/j.jasrep.2018.03.006 © <2018>. This manuscript version is made available under the CC-BY-NC-ND 4.0 license http://creativecommons.org/licenses/by-nc-nd/4.0/
Figure 36 trail connecting Cabugao coastal settlement with Malague in Cagayan valley, which is approximately 95 kilometers in terms of Euclidean distance; illustrated in a portion of Mapa que dumuestra la situacion de la Provincia de Cagayan. Unknown Cartographer, Undated (Courtesy of the National Archives of the Philippines)
Figure 47 Guillermo Galvey route passing from Bangued to Tayum to Tineg then to Malague highlighted in orange line (Courtesy of Archivo General Militar de Madrid)
Figure 18 Historical map georeferenced using at least ten control points Spline option. Yellow arrow shows georeferenced settlement of Tayum in historical map as well as the topographic basemap (Courtesy of Archivo General Militar de Madrid)
Figure 19 Historical map georeferenced using at least ten control points and the Spline option. Yellow arrow shows georeferenced settlement of Tayum in historical map as well as the topographic base map. Plano Topografico que comprende
una parte de la Provincia de Ylocos Sur, en la que se hallan situados los Distritos Militares de Tinguianes e Ygorrote. Unknown cartographer, Undated (Courtesy of the National Archives of the Philippines)
Figure 20  Historical map georeferenced using at least ten control points and the Spline option. Yellow arrow shows georeferenced settlement of Tayum in historical map as well as the topographic base map.  

Ydea aproximada del Territorio entre Cagayan e Ylocos. Unknown Cartographer, 1794 (Courtesy of the National Archives of the Philippines)
Figure 21 Historical map georeferenced using at least ten control points and the third order polynomial option. Yellow arrow shows georeferenced settlement of Tayum in historical map as well as the topographic basemap. Penarubia Map (España. Ministerio de Defensa. Archivo del Museo Naval 78-27. Filipinas. Croquis de la Provincia de Abra. 1868 al 1874)
Figure 22 Historical map georeferenced using at least ten control points and the Spline option. Yellow arrow shows georeferenced settlement of Tayum in historical map as well as the topographic basemap. Mapa Geográfico del Centro de la Abra en la Provincia de Ylocos. Unknown Cartographer, Undated (Courtesy of the National Archives of the Philippines)
Figure 23  Mineral resources map georeferenced using at least ten control points and the Spline option. Yellow arrow shows georeferenced settlement of Tayum in historical map as well as the topographic basemap. Based on Abra portion of Mineral Resources Map of the Cordillera Autonomous Region (Mineral Lands and Topographic Survey Section, Mine Management Division, Mines and Geosciences Bureau)
Figure 24 Digital elevation model of research area with settlements sites indicated. Least cost path rasters connecting settlements are digitized into polylines. Georeferenced historical map trails digitized as polylines (with grayscale shadows). Mine symbol indicating areas where there are explored and developed mines (ASTER GDEM is a product of METI and NASA).
Figure 25 arrows show a portion of the trail that was cut later by a contemporary road; old trail follows both the Guillermo Galvey georeferenced and digitized historical trail and the Tineng to Calanitian least cost path (Using WV3 mining combination, yellow-NIR1-red edge) (DigitalGlobe Foundation)
Figure 26 arrows show a segment of contemporary road that is parallel to the Malague to Tayum and Tineg to Calanition least cost paths (Using WV3 mining combination, yellow-NIR1-red edge) (DigitalGlobe Foundation)
Figure 27 arrows show traces of a trail parallel to the Tineg to Cabugao and Malague to Cabugao trail (Using WV3 mining combination, yellow-NIR1-red edge) (DigitalGlobe Foundation)
Figure 28 arrows show contemporary trails parallel to both the Galve trail and the Tineg to Tayum and Malague to Tayum least cost path (Using WV3 mining combination, yellow-NIR1-red edge) (DigitalGlobe Foundation)
Figure 295 arrows show a contemporary trail that is parallel to the Malague to Tayum least cost path (Using WV3 mining combination, yellow-NIR1-red edge) (DigitalGlobe Foundation)
Figure 30 arrows show some contemporary roads parallel to the Bucao to Narvacan trail (Using WV3 mining combination, yellow-NIR1-red edge) (DigitalGlobe Foundation)
Figure 31 arrows show some contemporary roads parallel to the Pennarubia geo-referenced and digitized trail (Using WV3 mining combination, yellow-NIR1-red edge) (DigitalGlobe Foundation)
Figure 32 arrows show some contemporary roads parallel to the 1794 trail. (Using WV3 mining combination, yellow-NIR1-red edge) (DigitalGlobe Foundation)
At this juncture we look at some potential Ijangs/ Ili or hillforth defenses of the Abra network. It is interesting to note that two Ijangs may have protected the main settlement of Vigan- Caoayan. Southwest of Vigan is Balaurte Hills/ Tamag Hills (Fig. 3) whereas Northeast of Vigan is the Bantay Hill (Fig. 34). That the name itself is Baluarte is interesting because its literal translation is place of refuge/ safe haven. I would argue that the baluarte function just like an Ijang to fulfill both refuge and defense requirements. Bantay; on the other hand, functioned as an Ijang that protected the villagers of Vigan- Caoayan- Bantay during the encounter with Juan de Salcedo and his troops (Keesing 1962:122-123). But what is more notable based on a close reading of the historical accounts is that Bantay is more of a naval stronghold. With the Vigan settlement located across the Govantes- Mestizo River from Bantay, Isabelo delos Reyes states that Bantay is an old pueblo that had facilities to shelter sampans [birays] and other smaller boats (142). Bantay came replete with a small paranaval fleet as can be gleaned by incidental intelligence (Scott 1982) on the account of Isabelo delos Reyes (2014). Reyes mentions that the naval force of Salcedo was intercepted by two native vessels for identification. When they were identified as hostiles, warning was sent out and so warriors were already standing at alert, waiting at the Govantes- Mestizo river banks as the force of Salcedo approached Vigan-Bantay (Reyes 2014: 141-142).

In the Cabugao- San Juan area, the Refaro hill may have served as an Ijang (for early references see Dizon and Santiago 1995, 1994). This particular Ijang may have been a habitation site as well since some ceramic sherds including earthenware and tradeware pieces were seen in the area during the survey of 2011. That Ijangs with ceramics can be evidence for habitation was established in the Batanes island group in the works of Bellwood and Dizon (2013) as well as Lacsina (2009).
Finally, also worth further exploration would be the case of the Santa Maria settlement. It is interesting to note that the current Ijang or Baluarte (Spanish Period Church) is facing the flank towards the mountains. There are; however, two hills that may have served as coastal ijangs towards the West of Santa Maria worthy of closer investigation (Fig 35).

Discussion

By virtue of the Abra river which allowed higher bulk exchanges, Vigan- Caoayan- Bantay was able to maintain a higher-order position in the gold trade among its coastal “peer” settlements to its North like Calanutian, Cabugao, Refaro, Magsingal and settlements to its South like Dumaquaque, Candon, and Narvacan. These rival settlements; however, may have usurped some of the trade by utilizing an intervening network of trails and footpaths that make a beeline through the Abra foothills and into the coast, by-passing the riverway (Canilao 2017a) (Fig. 36). These rival trading partners for the seaborne merchants may have continuously challenged the trade dominance of Vigan- Caoayan- Bantay by maintaining these alternative routes through which products can be moved albeit in lower bulk exchanges. Thus Vigan could not monopolize the gold transaction with seaborne traders.

In terms of migration, Keesing argues that a minimal theoretical case or model seen applicable in Northern Luzon involves an initial migration by a lowland group into an adjacent mountain area (Keesing 1962: 342). Two specific cases he presented include the Pangasinan- Ibaloi relationship and the Ilocano- Tingguian/ Itneg relationship (Keesing 1962: 342). In the case of the former, one of the major impetus is gold extraction by placer and lode mining, following the Agno River (Canilao 2011). As for the latter case, it appears that in addition to gold extraction, control of the gold trade may have accounted for the major migrations in
subsequent periods (Canilao 2015: 10, Keesing 1962: 121, 342, Cole 1945: 149). More specifically, attempts to control Abra River waypoints, its gateway locations, its choke points as well as jump-off points to the other side of the Cordillera Mountain-Cagayan Valley. Thus, later or subsequent migrations into Abra may be tied to the earlier emergence of coastal maritime trading centers as evanescent markets transformed into semi-permanent markets and eventually permanent markets on the coast notably Vigan-Caoayan-Bantay, Narvacan, Cabugao, and Calanutian.

This movement may have also fluctuated back and forth as one particular historical account for the town of Patoc now Pennarubia in Abra claim that their founders were migrants from Tamag hills next to Vigan. Apparently these are Tigguian/Itnegs, who migrated to Pennarubia Abra to serve as trade intermediaries between their Cordillera kin and the Ilocano as well foreign traders (Mateo 2004: 194). Again, it is argued that these movements reflected agentive drive by coastal peoples to the interior in order to fully control strategic “choke” points or bulking stations in the gold trade.

The inward migration into Abra may have further increased with Spanish colonization taking hold of the coastal districts because of the practice of remontados or the escape to the mountains. It is argued that at the close of the Spanish colonization in the late 19th c and by virtue of reduccion or assimilation, coastal Ilocanos were already hispanized but still with some traces of the indigenous traditions surviving. Eggan, for instance, notes the striking similarity between Tingguian/Itneg and Ilocano villages which when compared to those in the interiors are much larger, with clusters of barrios round a nucleus from where the lakay rules. He states that wealth per capita also increases sharply as one goes towards the coast, with many rich men
among the Tingguian/ Itneg and Ilocanos (Eggan 1941: 13- 16)(author’s emphasis). In terms of spirituality, both Tingguian/ Itneg and the pre-hispanized Ilocanos believe in the central hero Kabunian. The Tingguian/ Itneg also recognize Kadaklan as the supreme deity whom for the Ilocanos’ is Apo- Dios, a contemporary syncretism of the Christian deity (Eggan 1941: 13- 16).

Interestingly, Sande specifically identifies usury as the source of wealth,

They have quantities of honey and wax, and trade these commodities with the lowlanders… They are all userers, lending money for interest and go even to the point if making slaves of their debtors, which is the usual method of obtaining slaves. Another way is through their wars, whether just or unjust, Those who are driven on their coast by storms are made slaves by the inhabitants of the land. They are so mercenary that they even make slaves of their own brothers, through usury. (Sande 1576: 69) (author’s emphasis)

Incidental intelligence of the above quote indicates middleperson skills in the gold exchange has many offshoots including adeptness to full time gold lending.

It is plausible that the coastal peoples who escaped to the Abra interiors did so to rejoin relatives. It should be stated; however, that return trips to the coast is also plausible according to Newson (2009) and Keesing (1962). Newson for instance says,

As contacts with the interior increased, others may have drifted down to the coast voluntarily, perhaps encouraged by kinship ties and trading contacts that predated Spanish arrival (emphasis mine) (Newson 2009: 195)
Finally, according to Keesing, the major consolidating force for the differentiation of the Ilocanos and Tinguian/Itneg is post-Spanish contact,

The overarching government system; the ecclesiastical imprint not only in spiritual matters but also technological improvement, literacy, and other secular fields; the making over of indigenous leadership into aristocracy of minor officialdom and wealth, money and commerce, the rise of urban centers, and, by no means least, the making of common cause in anti-Spanish movements (1962: 326)

At this juncture we look at the remote sensed data on gold extraction. Remote sensing was carried out within 2 kilometer blocks of the digitized mines based on the georeferenced mineral resources map and it is notable that a cluster of indigenous small scale miners was remote sensed in Pacoc-Lacub area (Fig. 37). Other digitized mines appear very close to riverine features with most examples in Licuan-Baay, Lagang-ilang and Tineg (the Licuan-Baay examples are in Fig. 38, 39, 40). While there is lack of conclusive evidence that gold extraction in these areas of Abra date back to the Early Historical period (10th to early 16th c), there is multiple lines of evidences showing that gold working (processing) tradition in Abra extends up to this period. This is surmised out of the trade ceramic data of Cole which was also analyzed by Laufer (Cole 1912). Cole also specifically noted a post Spanish contact decline in gold working in Abra arguing that it was more prevalent in the centuries before (Cole 1915). The high volume of trade ceramics in the region mainly in heirloom contexts but also in burial contexts (Cole 1912) may give an impression of the amount of gold used in the barter exchange to acquire these status symbols. Indeed, the Spanish contact and post Spanish contact prosperity of the coastal
people as well as the neighboring Abra Tingguian/ Itneg is quite relevant as shown above (Newson 2009, Eggn 1941).
Figure 33 Baluarte/ Tamag Hills Southwest of Vigan encircled in yellow (Using WV3 soils and construction combination, red-blue-yellow) (DigitalGlobe Foundation)
Figure 34 Bantay Hills Northeast of Vigan encircled in yellow; note Govantes- Mestizo River between Vigan and Bantay where Birays and smaller vessels could dock according to Isabelo delos Reyes (Using WV3 soils and construction combination, red-blue-yellow) (DigitalGlobe Foundation)
Figure 35 Arrow shows Ijang facing the interior which is the site of the Church of Our Lady of Assumption built 1765. Encircled are the possible coastal Ijangs for further exploration (Using WV3 soils and construction combination, red-blue-yellow) (DigitalGlobe Foundation)
Figure 37 note cluster of indigenous small scale mining near digitized mines area (lode mining) in Pacoc, Lacub, Abra. (Using WV3 mining combination, yellow-NIR1-red edge) (DigitalGlobe Foundation)
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Figure 38 river at Mogao, Licuan-Baay, Abra. (Using WV3 mining combination, yellow-NIR1-red edge) (DigitalGlobe Foundation)
Figure 39 river at Domenglay, Licuan- Baay, Abra. (Using WV3 mining combination, yellow-NIR1-red edge) (DigitalGlobe Foundation). (Using WV3 mining combination, yellow-NIR1-red edge) (DigitalGlobe Foundation)
Figure 40  River at Lenneng, Licuan-Baay, Abra. (Using WV3 mining combination, yellow-NIR1-red edge) (DigitalGlobe Foundation). (Using WV3 mining combination, yellow-NIR1-red edge) (DigitalGlobe Foundation)
Cole and Worcester archival photos (Figs. 3, 4) also show aspects of gold working as well as the ceremonial/spiritual importance of ceramics/jars for the Tingguian/Itneg (for an example see CSA 28754 Cole archival photos in the Field Museum).

Conclusion

The more recent practice of gold extraction in Abra compared to the other networks to its South notably Angaqui network and the Lepanto network are good indicators that the Abra river valley flats functioned mainly as bulking stations or conduits for the gold trade sourced from these headwater mines. The prosperity of the valley may have been achieved by controlling the flow of the gold trade from Minlaoi and Lepanto. This type of articulation is also evidenced by the fact that the Angaqui settlement became a fully riverine settlement articulated to the Lepanto-Cervantes settlements with no functionality for vessel spotting (a requirement for evanescent markets). Abra settlements like Tayum, Bucao, Bangued, Lagang-ilang also did not have visibility of ships in the coast but were fully integrated into the high bulk exchange that plied the Abra River and whose schedule was dictated by Vigan-Caoayan-Bantay. In fact, this is again linked to the argument that coastal peoples migrated into the Abra riverine valley to control of the Abra trade network. The anomaly; however, is the settlement of Tineg which is arguably a strategic jump-off point on the route/trail towards the Cagayan valley (Malague) as evidenced in the georeferenced historical maps rather than a bulking station for gold. Finally, Cole has continued to lament that the gold culture of the Tingguian may have been at its peak during the early periods (Early Historical Period)
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