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Forming The Rapid Survey Interdisciplinary Team with Multiscalar Tradecraft: a Plea in the Backdrop of the Anthropocene

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Abstract

This is a short note/plea to colleagues in various disciplines to tackle more diverse and interdisciplinary research questions in the face of the Anthropocene and its avalanching havoc on biodiversity and the environment due to human-induced climate change. The contemporary fast-paced world and the field site are rapidly changing and there may be a need to rethink purely archaeological or anthropological fieldwork. There is a compelling need to create interdisciplinary teams that can capture as much data as possible while in the field. Fieldwork by any specialist undoubtedly brings the researcher face to face with facets of the projects that her/his specialization does not encompass. This paper advances the utility of forming interdisciplinary teams with multiscalar toolkits to cater to the dynamics of the field site. This type of project could be undertaken by research universities, research museums, and both government and non-government organizations. The toolkit includes the use of satellites, remotely piloted aerial systems (RPAS), and ground-truthing technologies. The approach promises efficient use of time and resources. This proposal may have further applications in other regions around the world.

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Introduction

This is an exploratory proposal that has the intention to show archaeologists and researchers in general the need to integrate research strategies that promote interdisciplinary collaboration in order to maximize resource allocations that would have been used up individually by a single discipline team alone. The urgency of the situation is exacerbated by

field/research site issues ushered in by what has been widely called the Anthropocene specifically the issue of human-induced climate change. The exploratory proposal is for the use of the putative “Rapid Survey, Glocal Interdisciplinary Squad” (RSGIS) that is equipped with tradecraft or toolkits that are multiscalar-ready. A squad size will have anywhere between 4 to 8 core team members. Ideally, this will be an umbrella of interdisciplinarians who can tackle the multifaceted research or field site. This approach is further highlighted with the presentation of one case wherein the RSGIS approach will have plenty of possibilities- the case is at the Baroro Watershed which is located in Northwestern Luzon in the Philippines (Figure 1). The possible venues for the RSGIS approach are universities, museums, NGOs, and other institutions both public and private. The proposition in this paper is actually not new it has been undertaken quite successfully by the Field Museum in Chicago Illinois (Field Museum), where this author serves as a Research Associate of the Negaunee Interactive Center.



Figure 1. Location Map (SRTM is a product of NASA)

Background

Anthropocene

Scientists all over the world are more than ever becoming *woke* to the climate crisis ushered in by the Anthropocene (henceforth will just be called Anthropocene). Various models have been presented showing the spectrum of possible scenarios based on seriousness on one end and lack of seriousness on the other end of world governments in addressing the issue (Mann and Kump 2016:102). The projections show a best scenario which is RCP2.6, a scenario if there is

Strong Mitigation. Another scenario is RCP8.5 which represents a business-as-usual scenario. Either way, the models show that there will be at least a 0.5 to 4.0 change in average surface temperature by the end of the Century (ibid). While this may not seem like a direct threat now it is important to note that rising global temperatures are directly correlated to sea level rise (SLR) and may even initiate a positive feedback loop wherein global climate dynamics may spiral out of control (so to speak) (Mann and Kump 2016).

Sustainable Development Goals

The United Nations Development Program promotes the Sustainable Development Goals (SDGs) as a means of mitigating the Anthropocene. Of direct relevance to the paper are SDGs 15 and 13. The former is called the “Life on Land SDG” and is a continuing call to restore and promote sustainable use of terrestrial ecosystems, including proper management of forests and mitigation of biodiversity loss (UNDP). The latter on the other hand the “Climate Change SDG” calls for urgent action to combat climate change and its impacts (UNDP). As will be shown here at least in the Southeast Asian region we could see that the two SDGs intersect at our typical field/research sites.

Ecosystem of Facts/Data/Features/Evidences

It is important to note that while our disciplines are “stand-alones” so to speak and our praxis has called for methods that are technically customized to our unique disciplinary approach, our research interests/facts/data/features/evidences are collectively part of an ecosystem. We cannot turn a blind eye to Facts/Data/Features/Evidences just because we are not specialists in this. **It may be an opportunity lost (author’s emphasis)** since we cannot expect these to remain unchanged due to the Anthropocene. In fact, our field sites/research sites present an integrated whole that encompasses cultural and social, artifacts ecofacts, historical structures, flora ecosystems, faunal ecosystems, past environments, and others (Figure 2). Consider for a moment that the aforementioned comprises the ecosystem or world of data then the implication is our core team composition must include an anthropologist, an architect, an archaeologist, a geologist, a paleontologist, a botanist, and a zoologist. But this is not the only articulation possible, in lieu of the Anthropocene we should also have an ecologist or an environmental specialist in the team.

Interdisciplinarity

At this juncture we define what interdisciplinary is vis avis transdisciplinary and multidisciplinary. Interdisciplinary analyses, synthesizes, and harmonizes links between disciplines into a coordinated and coherent whole (Choi and Pak 2006). It is different from trans disciplinarity which is a putative melting pot of various sciences in a humanities context. It is different from multidisciplinary which simply brings together a team who will simply share arise to the site so to speak, work autonomously from each other and nothing else.

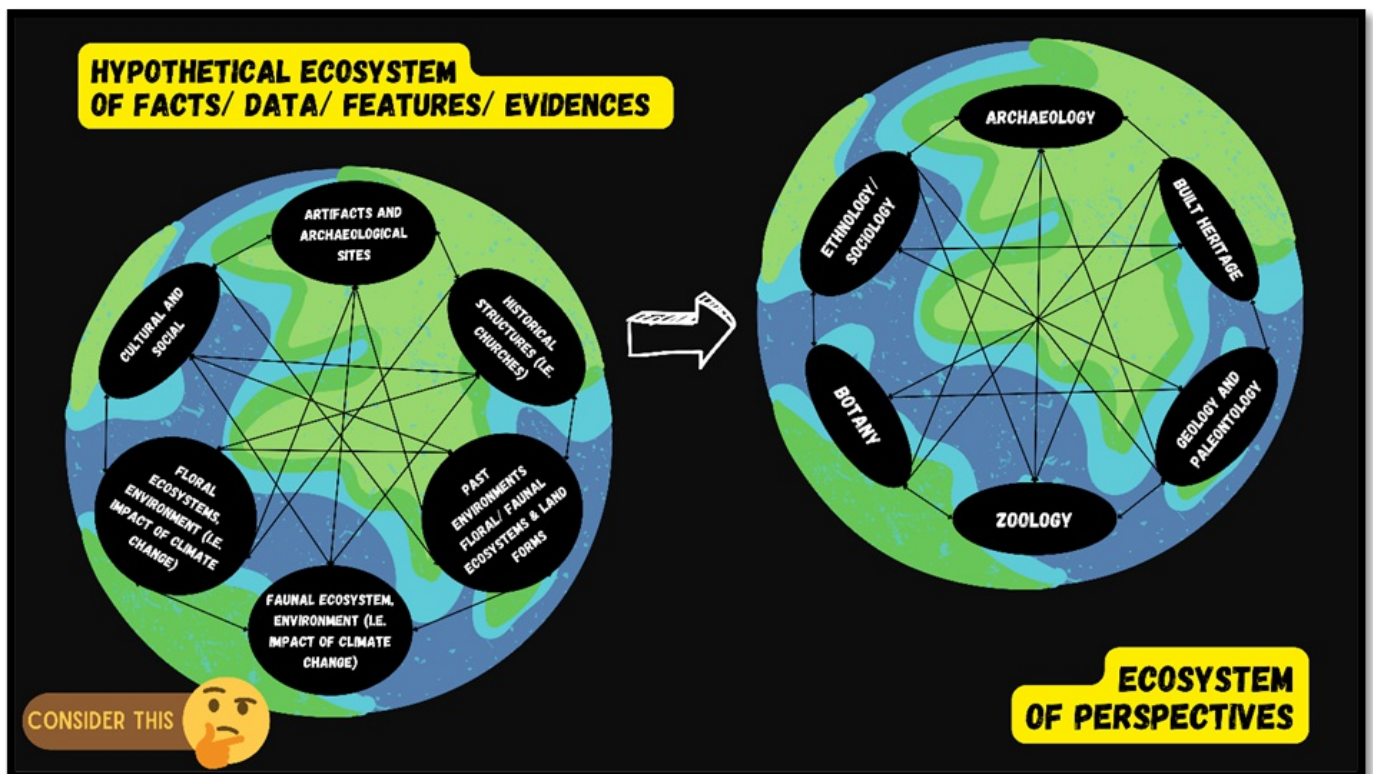


Figure 2. Ecosystem of facts, data, features, evidences.

Proposed Methods - Multiscalar Tradecraft

The multiscalar method is the integration of macro, meso, and micro survey/documentation tools with the tools available to us today; this may even include the putative in-between spaces. The macro scale and meso scale and at times even the micro scale data may be filled in with the use of satellite assets in space. Due to the advancement in spatial, spectral, and temporal resolutions, they may even fill in for the micro scale. We may now have the capability to access data in real-time. The meso and micro scale and, to some extent, part of the macro scale on the other hand may be accessed through the use of RPAS. In this paper, it will be shown that the minimum requirements for this integration of a multiscale tradecraft can be achieved with small and compact Consumer Off the Shelf RPAS (compact COTS-RPAS). Prior to operating an RPAS, the researcher must adhere to relevant local RPAS laws. The researcher is also expected to already possess the relevant training and accumulated flight hours.

The traditional toolkit will also be the invaluable ground truthing. It may even involve the use of non-destructive, ground-penetrating technologies like the use of Ground Penetrating Radar (GPR). The basic would be a field survey which involves targeted or random sampling of the study area and a collaborative endeavour for all team members.

The Baroro Case

At this juncture I now present the Baroro Case which I argue in this paper, is a good case study for testing out this kind of

exploratory proposal. The outline will include the location, archaeology, biodiversity, and global interdisciplinary survey (LABGIS). The Calincamasan site was dated to the 12th century together with the Aludaid site (Figure 3). The two sites lie on promontories at the Baroro River delta. The Marzo site in Calincamasan



Figure 3. Specimens from Calincamasan and Aludaid.

features a burial with a stone marker. The specimen inventory record of both sites shows a prevalence of earthenware, stoneware, and porcelain in the sites. There is also the presence of trade beads.

The Calincamasan and Aludaid sites typify a lot of coastal archaeological sites in both Mainland and Island Southeast Asia. This appears to follow a pattern first proposed by Bennet Bronson in 1977 (Figure 4). The original functional model shows that the drainage basin or the dendritic tree formed in a river watershed while it is a natural process also weaves the cultural processes that establish settlements. The main argument is that the delta or the estuarine location is in fact the center of trade that links the upland lowland trade and the maritime trade as well. Heading upriver, one will encounter in varying degrees the 2nd, 3rd, and even 4th order centers before eventually encountering the ultimate producers in the headwater areas (Bronson 1977).

The natural processes mentioned earlier basically stem from the mixing of salt water from the sea and organic matter plus land sediments which churn out kaolinite clay iron oxides and tidal flushing. This natural formation process brings about a mangrove/brackish water environment that is ideal to support a biodiverse ecosystem (see Canilao 2023a).

The ecosystem will include all trophic levels beginning with the producers, the primary, secondary, then tertiary, and finally

the quaternary consumers in that delta estuarine area. In fact, raptors are the commonly seen quaternary consumers in a biodiverse region. In fact, their mere presence is good news because their presence alone signifies the presence of a healthy ecosystem-- that all components down the pyramid are complete or intact.

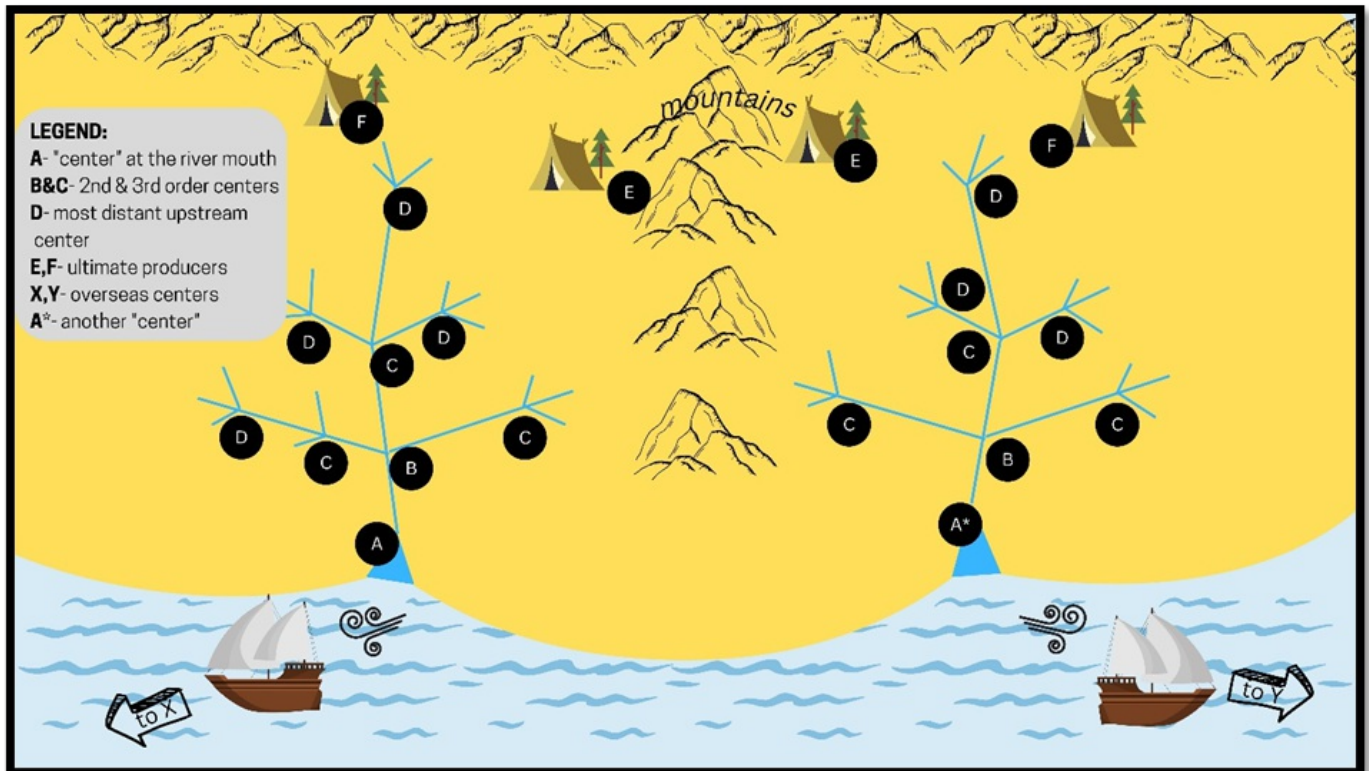


Figure 4. Organizing principle in delta estuarine areas (After Bronson 1977)

And perhaps that is really the main point here the delta regions where we find our site are also the centers or hotspots for biodiversity. Our multifaceted sites cannot be given a disservice by getting single lenses of research but will instead immensely benefit from a more integrative and interdisciplinary approach that covers all faces of the multifaceted research site. Such an approach will also feature the optimal utilization of time resources and multiscale tools in studying the site which is also the intersection of the past and present.

In the proposed case Baroro watershed the Brahminy kite is the quaternary consumer, and their hotspot coincides with the archaeological sites of Calincamasan and Aludaid.

Brahminy Kite

The Brahminy kite is a raptor that is called locally Kali or Dialombog. Other common names include Red-backed sea eagle and Singapore bald eagle. Over a period of more than a year beginning in September 2021, all Kali sightings were recorded and plotted on a GIS base map. A point density algorithm was implemented, and the results indeed show that the hotspots of these kites are in the Baroro delta or in the estuarine area (see Canilao 2023b).

Discussion

The GIS approach needs to be undertaken in the Baroro watershed as soon as possible. The Brahminy kite and a lot of other fauna are under threat from both habitat destruction and illegal wildlife trade (DENR 2019). Addressing this issue will tackle with SDG 15 since we are looking at solutions to deforestation and its corresponding destructive outcome of biodiversity loss. Therefore, a successfully undertaken RSGIS approach by the multifaceted team composition can look at the overall ecological dimension and its interdisciplinary avenues for analysis and mitigation. Also in direct relevance to Island Southeast Asia is the threat posed by sea level rise or SLR. Our delta estuarine archaeological and biodiversity sites are actually **under threat from SLR (emphasis mine)**. This also lends credence to the need for the RSGIS approach to be implemented ASAP, this directly addresses SDG 13.

Also in direct relevance to the Philippines is the problem of Deforestation with data showing that forested area in the Philippines between 1575 to 2015 was greatly reduced from 27.5 million hectares to just 7.01 million hectares in 2015 (La Vina, Carnivel, Reyes 2021). Addressing this issue will tackle with SDG 15 since we are looking at solutions to deforestation and its corresponding destructive outcome of biodiversity loss

Finally, the case proposed is in need of the RSGIS approach now more than ever because data shows that forest deforestation *per se* is not the only issue, but it is the fragmentation of whole forest systems into microforest patches. These microforests patches will not be able to support biodiversity ecosystems compared to continuous forest wholes. For the Baroro watershed, the data shows that forest reduction was **96.4 % over the last 28 years (Ramirez et al 2019: 10, 13 [emphasis mine])**. Addressing this issue will tackle with SDG 15 since we are looking at solutions to deforestation and its corresponding destructive outcome of biodiversity loss

Conclusion

In concluding this short note/appeal, now more than ever we are presented with the need to come up with viable solutions to ever-growing problems and issues brought about by Anthropocene. The paper presented an avenue of solution by articulating the need to activate the RSGIS or Rapid Survey Glocal Interdisciplinary Squad. The time has come to reach across the aisle and engage fellow researchers in undertaking interdisciplinary articulations.

Calincamasan and Aludaid sites were not revisited. The one-time excavation in the Marzo site Calincamasan site alone was only able to reveal 3.25 % of the area. There may be a need to revisit the site and there is a very big possibility that there is more archaeology in the area. This time around the archaeologist will be part of the RSGIS.

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Relevant Links

- <https://www.rapidinventories.fieldmuseum.org/>
- <https://www.undp.org/sustainable-development-goals>
- <https://www.undp.org/sustainable-development-goals>
- <https://www.youtube.com/watch?v=HacLD59BrR4>
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