Indigenous Methodologies as Development Practice:
On the Methods & the Ethic of International Development

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Kenji Tomari
University of California, Davis

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Executive Summary

The practice of development has long been criticized for its role in carrying out the political agenda of developed nations and continuing the colonial legacy of foregrounding Western knowledge and values. This was most pronounced in 1990's with the emergence of Post-Development theories. Yet despite the prediction of the collapse of development, critics of Post-Development point out that the development industry persists. Given this, those still critical of development need an alternative approach to engage the industry; and one not born of romanticized and essentializing conceptions of indigenous people as those proffered by Post-Development. Indeed, the very matter of the possibility of representation is misunderstood in Post-Development. As such, this paper utilizes a closer reading of Postcolonial Studies and Gayatri Spivak's subaltern, alongside methods from Indigenous Studies to present a possible way out of the contradiction of representation in development's production of knowledge. This is followed by an exploration of Indigenous methods in the context of development work conducted in El Petén, Guatemala in 2017. It concludes by bridging the implications of the ongoing problematic of representation in development, particularly as it is reinforced by information technology, with continuing efforts to support Indigenous development practitioners in northern Guatemala.

Introduction

This paper is primarily divided into two parts, a theoretically-informed discussion on methods and a description and critical reflection of my projects in Guatemala. It is also a tale of two very different interpretations of method, one that engages the framework that undergirds the practice of development itself, and the second that is more posterior, operationalized and applied. In this case, I utilize Indigenous methodologies and a Critical Data Studies approach to undergird a project of participatory exploratory spatial data analysis.

In the first part, I begin with a brief genealogy of development. I then argue, following Ziai (2015), that the critiques of development that emerged from Post-Development literature continue to problematize and "haunt" development, both in practice and in theory, despite valid critiques levied against it. As a corollary, the project of development also persists and thus demands thorough criticism beyond superficial bootstrapping. Following a brief description of how Post-Development theories interpret the project of development, I argue that the epistemological ramifications of development brought to the fore by Post-Development theories justifiably demand a re-evaluation of how development practice operationalizes knowledge: indeed, the manner in which knowledge is retrieved and represented in development shapes projects of development, and thus development needs to critically address knowledge production. While Post-Development does well in attending to the discrepancy in power between various stakeholders in development, I utilize discussions around representation as articulated by Asher and Wainwright (2018) to first argue that Post-Development's 'alternatives to development' still stumble over the matter of knowledge retrieval and

then to explicate, following Byrd and Rothberg (2011), how the union of Postcolonial thought (around Gayatri Spivak's subaltern) and the normative exigency found in Indigenous studies may provide a path forward. I conclude by elaborating the consequence of the latter on development practice by examining the role of reciprocity and accountability in development, drawing upon the work of Linda Tuhiwai Smith and provocations found in "Accomplices Not Allies" (2015), and thus attend to the problem of representation in knowledge retrieval. In short, I argue for the consideration of Indigenous research methodologies as the ethic of development practice.

In the second part, I describe an embryonic approximation of this ethic in my work with Q'eqchi' Maya development practitioners in northern Guatemala. Here I describe the projects in which I participated and reflect upon them critically. I emphasize the problems of representation in my previous work, while underscoring a singular observation from the experience: namely, the discrepancy between the way information technologies are utilized by my partners in Guatemala and the emerging trend of utilizing Big Data in development. I then relate this digital divide with the problematic of representation in order to assert that a potential point of intervention exists for development practice which engages both issues at once. Namely, I present the opportunity to utilize existing data and technologies in order to bring a development practice of the sort in which my Indigenous partners in Guatemala have long excelled to the fore.

1.1 Developments

A discussion of development necessarily begins with two things, some intimation at defining it and also historicizing it. However, a thorough definition and history of development is beyond the scope of this paper. Moreover, attempting such a work without notice of its intent necessarily suggests the proposition that simplicity and—critically—objectivity can be elicited in relaying it. Much as any definition or history, that of development entreats a position be taken: indeed, such is the intention of this work. This paper follows a "transformative framework" that comprehends research as a project of emancipation, demanding action, and one that understands knowledge as something that cannot be stripped of social power or deigned neutral (Creswell and Poth 2018)[1]. To work on the subject matter of development otherwise, without some critical analysis of it, would be a significant failure and one that presents the likelihood of reproducing the violence and dispossession of colonization.

Here, we may begin by defining development as falling under one of two headings, immanent or intentional processes (Cowen and Shenton 1996). The suggestion here is not that development is a binary thing, so much as a term utilized in post-Enlightenment Western literature in two distinct ways. The first way, an immanent process, is descriptive of the way in which capitalist economies shift and change. The second way, an intentional process, is best understood as a project taken upon by a

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[1] I do remain critical, however, of Creswell and Poth's description of the transformative framework as one that intends to "help" marginalized others. Indeed, I counterpose that transformative frameworks must begin from understanding the struggle for liberation is a struggle for each of us. Often misattributed to Leela Watson, I think the quotation from the Queensland Aboriginal Activists of the 1970s bears worth reproducing here in full: "If you have come here to help me, you are wasting your time. But if you have come here because your liberation is bound up with mine, then let us work together."

trustee to guide and direct another toward some better end. The latter is described by

Cowen and Shenton (1996) as the "doctrine of development." Both are enveloped in the

idea of 'progress' following French philosophers like Saint Simon and Comte (Cowen

and Shenton 1996), and are thus bound together; however, the (intentional) doctrine of

development builds from the concept of the immanent process in order to make a

specific claim: there is a need for trusteeship—a need for another community or society

to change through a mentoring relationship. Gillian Hart (2001), utilizing the above

distinction, separates little 'd' (immanent) development from big 'D' (intentional)

development; this paper adopts this nomenclature for the remaining discussion. Thus,

we see that the history of development may be placed alongside the origins of

capitalism(s), whereas the history of Development could begin more proximally with

nineteenth century French philosophers.

However, for the purposes of this discussion, the history of Development is

truncated to mark its origins with the beginning of the Cold War, rather than pursuing it

to nineteenth century histories. This not only precludes the philosophical discourse that

hovered around Development as alluded above, but also the histories of imperialism and

European industrialization that set the preceding stage of trusteeship of territories

beyond the European metropoles. Indeed, the effort here is simple: to center the

influence of the United States on the discourse around Development, both for its lasting

impact (to the present), as well as the matter that a complete genealogy of Development,

notwithstanding other Western, Soviet, and non-Western contributions, would be

ambitious and unnecessary for the thesis in the following section. While Cowen and

Shenton (1996) have demonstrated that Development is better traced to nineteenth

century Europe, by following the critique of Post-Development theorists (e.g. Escobar 1995; Esteva 2010), this paper adopts the argument that the contours of Development that follow the onset of the Cold War globally mirror or remain in conversation with the US project of Development[2]. Moreover, as Asher and Wainwright (2018) describe, this Cold War era Development importantly marks the emergence of Development as a project of state-led national economic growth and political modernization, which not only lays out a rigid roadmap of Development through technocratic means, but periodizes it as an anti-Communist project. Thus, by centering post-WWII US Development, the deconstruction of Development as a hegemonic process and an interrogation of the extant form of Development can still be properly articulated as it sufficiently departs from its origins in the nineteenth century.

The admittedly heterogenous body of Post-Development literature typically casts the US project of Development as originating with the 1949 inaugural speech of President Harry Truman, which both condemned "old imperialism" whilst setting forth a Development project to shape "underdeveloped" nations (Truman 1949; Escobar 1995; Esteva 2010). As Ziai (2015) illustrates, Post-Development—a post-structuralist deconstruction of the power and colonial legacy intrinsic to Development—defines and critiques Development with five principle arguments, that it is: a Western ideology; a failed project in need of burial; a hierarchic and Eurocentric construct; an economization and dis-valuing of traditional lifestyles and knowledge; and a

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[2] Arguably, the coming US $1 trillion project coming from the Chinese Belt and Road initiative signals a sea-change in the Western hegemony of Development (Kuo and Kommenda 2018). However, to what extent this Chinese model will differ from the model of Development the US adopted during the Cold War has yet to bear out.

legitimization of domination and violence. Ziai presents numerous critics and their critiques of Post-Development (albeit overlooking some important perspectives from geography, e.g. Watts 1993; Hart 2001), representing a gradient from justified damnation to less substantive though abrasive excoriations. Notably, early Post-Development literature fell flat in its romanticization of the 'local', or in other words, its nativist position that essentialized local-scale, Indigenous communities and their related social movements as functional 'alternatives to development'. Strikingly, Ziai (2015) rightly concludes that neither Development, nor Post-Development are dead, but rather continue to haunt each other: the funding and the institutions that compose the former have not abated since the close of the Cold War, nor has the reproduction of the core arguments of the latter ceased to be published. Indeed, much of the content of this paper addresses extant Development and relies in part on the analysis born from early Post-Development scholars, particularly in their conclusions that draw upon Foucauldian discourse analysis and Said's *Orientalism*; and that emphasize a critique of modernization and neo-colonialism[3] as manifest in Development.

1.2 Post-Developments

For the purpose of this discussion, the key salient proposition of Post-Development theory centers the matter of knowledge and representation. Specifically, the largely Foucauldian bent of Post-Development directs its theorizing at the relationship between power and knowledge (hence, the subtitle of the seminal Post-Development text, *The Development Dictionary: a Guide to Knowledge as Power*).

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[3] By which I mean, the continued influence or even reproduction of the structures of colonialism following formal processes of post-war decolonization.

Indeed, many of the works of Post-Development consider power as that which wields a specific formulation of knowledge, understood by Foucault as discourse4. For Escobar, "discourse produces permissible modes of being and thinking while disqualifying and even making others impossible" (1995, 5). He further argues that the discourse in development has, "created an extremely efficient apparatus for producing knowledge about, and the exercise of power over, the Third World" (9). In effect, the Development discourse, even as it responds to new ideas and shifting cultural values, continues to reproduce a hierarchy of power through knowledge and expertise that positions Development agents (e.g. Development banks and experts) above those they are Developing (from institutions of Developing nations to remote communities). Indeed, even as the Development industry adopts practices like Participatory Rural Appraisal (see Chambers 1994) or Participatory Action Research in order to be more inclusive of the perspectives of those being Developed, its employment of 'participation' may, "[act] as a deceptive myth or a dangerous tool for manipulation" (Rahnema 1992, 138-9). In the mid-1990s, the World Bank attempted to undo its paternalistic legacy—perhaps as a response to Post-Development—by re-inventing itself as a "Knowledge Bank," intent on simply providing "unbiased" scientific resources for the Developing national institutions and NGOs it funded. Yet, Lie (2016) demonstrates, the Bank still continued to reproduce its discursive power that privileged a Eurocentric episteme. In short, what is at stake here does center power, but crucially the way in which power fails to internalize the

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4 Foucault's use of the term discourse is understood as partially inconsistent, but can largely be understood as a "regulated set of statements which combine with others in predictable ways. Discourse is regulated by a set of rules which lead to the distribution and circulation of certain utterances and statements" (Mills 2003, 53-4).

knowledge and world-views of others. The 'Other' in question, following Escobar on

Edward Said, is the part of humanity who have become enveloped by Western culture

due to histories of colonialism, but whose understanding of development and cultural

values stand apart, or more precisely, resist this hegemony (1995, 11). Stated differently,

knowledge construction can be understood as a central project of Development, one that

executes the dialectical relationship between the production of knowledge and the

administration of (colonial) power (Said 1979, 36).

With respect to the matter of representation, Post-Development—however

cognizant of colonial histories of power—still suffers the criticism of essentialism that it

rejects (Ziai 2015; Asher and Wainwright 2018). In particular, Asher and Wainwright

(2018) bring forward the argument that Arturo Escobar and his *Encountering*

Development: the Making and Unmaking of the Third World (1995)—perhaps the most

influential book from Post-Development—produces an essentialist position with regard

to the subaltern5. Escobar borrows the term subaltern from Postcolonial Studies in his

narratives of local and Indigenous communities and movements, and describes them as

agents against Development, who, in contrast, favor 'alternatives to development'.

Escobar suggests that in order to combat Development's representations of the

subaltern (i.e. confronting the claim that Development planners know what Developing

people want), that critical ethnographic retrieval can be used as a method "to access the

subjectivity of marginalized cultural groups" and thus bring cultural difference to the

foreground (Asher and Wainwright 2018). In doing so, traditional knowledge can be

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5 The subaltern may be crudely described with as much brevity as "oppressed subjects." It is a term which emerged from Antonio Gramsci, but later utilized by Postcolonial theorists, notably Gayatri Spivak (Gandhi 1998, 1) .

recovered and planted as seeds of 'alternatives to development'. However, Asher and Wainwright markedly contend that Escobar bears meager attention to Gayatri Spivak's Marxian theorization of subalternity. They posit that Escobar interprets resistance to Development as an essentialized and monolithic entity. Indeed, the subaltern are not a singularity that Escobar can swiftly represent as the "resistance." Moreover, Escobar misunderstands that the subaltern, while fully capable of speaking for themselves, cannot functionally be heard by the apparatus of Development, or by the Western episteme and science at large. Indeed, Asher and Wainwright contend that, representing the subaltern is an aporia: a contradiction wherein representation is both impossible, yet necessary. As much is clear through the examination of one of Escobar's own prominent examples of an 'alternative to development', the concept of Buen Vivir. Importantly, his account bears a striking difference from autochthonous accounts (Hidalgo-Capitán and Cubillo-Guevara 2017). Poignantly, Hidalgo-Capitán and Cubillo-Guevara illustrate that the original conception was in fact a synthesis of various Indigenous cosmologies and Post-Developmental theoretical positions, and thus should already affirm a problem of representation for the likes of Escobar. Following Spivak, Asher and Wainwright (2018) conclude that there is no possibility of good representation (again, the point Escobar evidently overlooks), and that what is left involves, "the labour of careful critique and patient undoing of the problematic of development…" and the "…perpetual scrutiny of representation, slow reading, and the aporetical inhabiting of contradictory 'double binds'."

Given the above arguments that posit Development is part of the discourse of Western hegemony and domination, and the impossibility of representation, how can a

Development practice persist which reflects an undoing of colonial legacies and the
desire for (just) material changes in subaltern spaces? As critics of Post-Development
have made clear, many marginalized communities still seek some kind of development,
albeit perhaps not one in the form of an unequal capitalist accumulation (Ziai 2015;
Asher and Wainwright 2018). Here, I argue that following Spivak's provocation above,
any form of Development that seeks to intervene on behalf of marginalized and
subaltern communities, must necessarily be in a recurrent and "slow" process of
representation. Moreover, Development must take heed not only of the complications
that Post-Development and Postcolonial theories present, but administer methodologies
emerging from Indigenous Studies. Indeed, there is no way out of this contradiction of
representation but the dirty work of living through it by way of building reciprocity and
accountability with subaltern communities[6].

1.3 Indigenous Methodology as the Ethic of Development Practice

Some methodologies regard the values and beliefs, practices and customs of
communities as 'barriers' to research or as exotic customs with which
researchers need to be familiar in order to carry out their work without causing
offence. *Indigenous methodologies* tend to approach cultural protocols, values
and behaviours as an integral part of methodology. They are 'factors' to be built
into research explicitly, to be thought about reflexively, to be declared openly as
part of the research design, to be discussed as part of the final results of a study

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[6] In short, solidarity–but one with teeth.

and to be disseminated back to the people in culturally appropriate ways and in a

language that can be understood. (Smith 2012, 15-6; emphasis my own.)

Linda Tuhiwai Smith, a prominent Maori scholar, makes the case for an

Indigenous or decolonizing methodology in her book, *Decolonizing Methodologies:*

Research and Indigenous Peoples. While the following discussion makes use of Smith's

propositions for Indigenous research methodology7, it is not a thorough review of the

matter. Rather, this section is an inchoate attempt to pull to the fore certain

instrumental propositions on methodology from Indigenous Studies. It is an effort to

find a way to live with the "double bind" presented in the above sections on Post-

Development and Postcolonial Studies. Indeed, as Byrd and Rothberg (2011) argue,

while tension remains between Postcolonial and Indigenous Studies, both fields, "share

an interest in challenging the logics of colonialism and deploying incommensurability as

a critical tool." Here, incommensurability not only speaks to problems of cultural

relativity, but may be understood to center the aforementioned contradiction of

representation: the (in)ability of the subaltern to speak and to also have their voice

received or heard. To reiterate, this issue introduces an inescapably encumbering

distance between institutions of Development or academia from local, Indigenous, or

subaltern communities, which undergirds the impossibility of knowing the desires of

marginalized communities. Following the work of Dale Turner, Byrd and Rothberg

underscore one of the crucial distinctions between Postcolonial and Indigenous Studies:

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[7] It should be evident that if the construction of knowledge is central to the project of Development, that the parallel between Development agents and academic researchers bear remarkable similarity, and indeed demand a parallel scrutiny.

where Postcolonial scholars raise the question of representation, Indigenous Studies respond with a deliberate practice of, "[situating] themselves in binding relation to—and indeed a part of—native communities…" (2011). As detailed below, Indigenous research methodologies, equally concerned with the impossibility of speaking for or from the place of Indigenous people, crucially emphasize the remedying role of accountability and reciprocity[8].

Smith refers to the principle of reciprocity largely in the context of sharing knowledge, which she distinguishes from merely "sharing information." The latter is discouraged as it may not take a form that is culturally appropriate or, indeed, useful to Indigenous communities (2012, 16). For Smith, the intention to be reciprocal must be integrated into the (research) relationship explicitly. However, Smith clearly indicates that reciprocity need not purely be a product of research efforts; they may involve practical matters (e.g. day-to-day chores or technical projects) that benefit the Indigenous community (2012, 10). While who either Indigenous "people" or "communities" exactly specifies is not clearly identified here, the intent of forming a reciprocal relationship suggests an approach that considers the people with whom researchers are in direct contact. In the process of building reciprocity, researchers (or indeed Development practitioners) are faced with the issue of making their work relevant to the communities that contributed to it, rather than assuming the work's broader implications will indirectly benefit the community in question.

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[8] For another perspective, these matters are also discussed in the context of scholar-activism in geography with marked acuity and relevance to themes of this paper (see Pulido 2008; Ybarra 2015).

Yet, reciprocity is insufficient on its own terms. As Smith articulates, sharing knowledge is a long term commitment and never a one-off exercise (2012, 16). If reciprocity is indeed an abiding engagement, then Smith is intimating at a second process: the building of accountability. Here, accountability refers not merely to an intentionality of building a rapport with a community, but having responsibilities to a community. To some extent, this already exists in Development projects that engage community development, for no such project progresses much without trust building. However, accountability further entails being tied to a place and a people, who share power in the relationship. Consider a reciprocal agreement between a researcher and a community that explicitly addresses not only the character of deliverables directed at the community, but does so recurrently in which further contact is conditioned upon the degree to which the researcher has been consistent and forthcoming. Beyond the suggestiveness gained from adopting the rhetoric of accountability, the explicit construction of mechanisms in which communities bear some capacity to hold researchers to account is critical. Certainly, the opposite capacity already exists in Development. The exact nature of accountability, therefore, demands an earnest effort on the part of researchers (or Development agents) to articulate and enact a means of offering their work up to the scrutiny of Indigenous communities.

Although only a parallel discourse, the contention surrounding the social justice oriented term "ally" bears some consideration in this discussion if only to illuminate how intention is insufficient. In particular, the provocations presented in "Accomplices Not Allies: Abolishing the Ally Industrial Complex" chastises "grassroots" and "community-based" organizers that only pay lip service to Indigenous struggles by

adopting the role of "ally" (Indigenous Action Media Collective 2014). This text deconstructs "allies" in an effort to illustrate what meaningful engagement with Indigenous struggles might mean: one in which Indigenous people are prioritized over institutional loyalty or personal advancement drawn from the social capital engendered by the application of the term "ally." Significantly, the author(s) establish that those truly endeared to the project of undoing colonial legacies must live the role of the "accomplice." In this text, an "accomplice" demands the acquisition of a meaningful degree of risk that is shared with those communities with which the accomplice means to intervene. This declaration is suggestive of a critical divide in the construction of accountability: whether one is merely responding (without listening) to the Other or implicating oneself in the struggle of the community and thus better able to hear. Perhaps, as researchers and Development agents, we must consider how we may situate ourselves such that we share the risks that our work circumscribes? A poignant critique of Post-Development against Development institutions highlight the matter that much, if not all, of the risks involved in funding lie not with the institution, so much as with the people of the Developing nation who must pay back the loans of failed projects (Escobar 1995, 160-1). This scenario reproduces itself down the food chain, so to speak, wherein Development practitioners deployed in the field unequally share the risk with the communities they seek to Develop.

 In conclusion, Development may be understood as a process of trusteeship that has been tied to colonial legacies by Post-Development scholars. The self-same Post-Development scholars, however, have been criticized for their romanticization of the 'local' and their eagerness to depict the 'Other' and subaltern as agents of resistance to

Development. A more careful reading of Gayatri Spivak's subaltern reveals that the subaltern can speak for themselves though unheard, and often do so with nuanced interpretations of the project of Development—despite what exponents of Post-Development like Arturo Escobar insist. This complicates the matter of understanding the desires of marginalized groups (the subaltern, the 'Other', Indigenous peoples, etc) to the point of impasse. Yet, there is an evident need for some representation as the existing system of Development bears inequality in the distribution of power. Thus, as interveners we are compelled to work through the "double bind" of representation. Where the Postcolonial lineage of this argumentation fades, the trail is picked up again by Indigenous Studies which responds with a vigorous demand for reciprocity and accountability. However, the terms for reciprocity and accountability must be articulated such that Developers do not merely adopt the language of accountability in rhetoric, but enact it through power sharing mechanisms and reporting back to subaltern communities.

Thus, the summation of this section may be distilled as an appeal for a "slow" and recurrent methodology of ethnographic retrieval in some attempt to shift the knowledge acquisition/reproduction regime of Development. Although left unstated above, this "slow" methodology of retrieval should not be mistaken as the opposite of "fast," but should be conceived, following Liza Grandia, "as a metaphor for alternative moral economies of scale" (2015). In turn, this methodology seeks a more equitable approach to the exchange, not only of knowledge, but of the time, energy, and resources embodied in the subaltern relationship with Developers (and academics). The following section,

consequently, embarks on an attempt to bridge this thesis with practice in my own work in Guatemala.

2.1 First Encounters

I began my relationship with the Indigenous Q'eqchi' Maya Development NGO, the *Association of Indigenous Farmers for the Integrated Development of El Petén*, or ACDIP, in the summer of 2017. I arrived to sweltering and humid northern Guatemala with fellow UC Davis students as a part of the Research and Innovation Fellowship for Agriculture (RIFA), through which we were able to work with ACDIP for several months. Alongside another group of students working at a partner NGO an hour away by public transit, ProPetén, we were one of the two teams from UC Davis guided by my advisor Liza Grandia in Native American Studies. Our collective intent largely reflected an effort to work with local partners dedicated to a Development practice that centered the desires of local communities. Although not discussed in length here, both NGOs and student groups critically shaped my experience of Development in northern Guatemala.

My team first entered the offices of ACDIP in La Libertad in mid-June, where the other two members of my team and I would work together for the following two months. There, we were given a long document originally intended as a policy recommendation for the national Guatemalan government that detailed a broad curriculum for Indigenous secondary students in rural Guatemala. In fact, through a successful anti-discrimination lawsuit, ACDIP had secured some funding to establish a secondary school not far from La Libertad, which was introduced to us as having some overlap with the policy recommendation. While ACDIP had a long history of Development practice around the Q'eqchi' community, having been founded in late 1990s, this would

be their first foray into administering a school. As such, it was deemed by a Ladino (i.e. non-Indigenous) legal consultant and ally of ACDIP that our team should translate the policy recommendation into an actionable curriculum proposal.

By the end of the two months, we had largely completed a rough outline of the curriculum proposal, which variously included a plan for an aquacultural system to raise Tilapia, a primer on agroeconomics, and sustainable agroecological theory that used Indigenous knowledge as its guiding principle. By the beginning of August, all other UC Davis students had returned to the United States, however I had chosen to stay behind to work on another project. In the process of developing a curriculum, we had amassed a large library of digital materials in the form of PDFs. Thus, I spent the following months designing an application that allowed for a simplified and convenient searching mechanism of the digital library. I utilized the Python programming language, developed my own search engine and application interface that facilitated a reasonably simple means of managing this large PDF database. I left ACDIP with a working copy of the software and the PDF database in December of 2017, having spent close to 6 months in total in El Petén.

In September of 2018, through a grant from the Blum Center for Developing Economies and the Hemispheric Institute of the Americas, I returned to Guatemala to begin a Development project that mapped ACDIP member communities and some key services in their locales in order to improve ACDIP's ability to assess the needs of their own members. I worked closely with the Sub-Coordinator Alfredo Ché Choc to establish a set of data we wanted to collect for ACDIP. Following data collection, I would then

convert it into an interactive webmap. By the end of the funding, we were able to collect about one-third of the community data.

2.2 A Critical Reflection

In broad strokes, my first two projects with ACDIP might be considered successes: my team was able to produce a report that included detailed information about a proposed curriculum and agroecological design for the school, and the digital library application functioned as described. However, I believe it raised significant questions as to the framework my team utilized in composing this report for the school, and my assessment of the utility of such an application. With regard to the curriculum proposal, our document provided a potentially viable means of communicating the goals of the school project with donors, such as various UN agencies, yet I suspect accomplished little in facilitating the actual construction of a curriculum for the school. I discovered on my second trip to Guatemala in 2018, that ACDIP had hired a fellow Indigenous school with decades of experience, Ak Tenamit, for consultation to collaboratively construct a curriculum that met the needs of ACDIP and governmental standards on Guatemalan education. It was clear to me that the document we had produced had little influence on the elaboration of the ACDIP curriculum. To clarify, I am not stating that our work had no impact, but that an Indigenous school curriculum necessarily builds on the collaboration of Indigenous peoples; whereas, perhaps, our team's document was more of a means for outsiders (including allies) to talk to themselves about the merits of such a school.

In addition to the curriculum, my team and I had also designed plans for an agroecological production system of the school campus. However, a concrete and

developed proposal only emerged as a result of a meeting ACDIP organized (for which

we had requested) with a few local Indigenous farmers. In essence, our role was chiefly

reduced to being the scribes of a conversation from which we largely abstained. We

typed up a report based on the conversation, however the design emanated from ACDIP

and their advisors. I believe this to be one of the more productive accomplishments in

which we participated, however to what extent we effectively facilitated this

collaboration is arguable.

In hindsight, my second project, the digital library software, clearly reflects some

considerable and flawed assumptions I made about the approach teachers and

administrators at an Indigenous school might take for knowledge production. I take full

responsibility in this misstep, however given the manner in which technological

solutions are often enthusiastically proffered as a means out of "underdevelopment," the

following critique may be more broadly applicable. My assumption envisioned the PDF

database itself as a tremendous resource, albeit one that was unwieldy in its

organization. I saw navigating the library as *the* problem. However, it remains to be seen

if teachers or administrators of ACDIP's school will find the PDF database to be the

obstacle I had seen. Indeed, given my experience in Guatemala, it would seem that my

time would have been better used to incorporate texts from the digital library into some

sort of lesson plan or other material deliverable that would further legitimate

Indigenous world-views to youth who face a crisis in the perceived legitimacy of their

traditional ways of knowing. Moreover, the means for knowledge transfer that I

centered was an altogether different paradigm than perhaps my Indigenous

counterparts at ACDIP might envision: one in which knowledge transfer would

underscore the role of elders over expertise probed from an (un-curated) digital library. Thus, I began with a technological solution, rather than understanding the complex interaction between technology and pedagogy that might be better mediated by non-technological solutions. My assumptions may have been circumvented had I communicated more clearly with ACDIP staff. Further, given ACDIP's inexperience with foreign volunteers, I realize that I needed to have taken a more proactive role: wherein I would schedule time for ACDIP staff and I to collaboratively produce a list of goals and expectations.

The final project that endeavored to map the locations of ACDIP member communities and critical services to Q'eqchi' communities was, perhaps, even less successful by traditional evaluation metrics common in Development. The scope of the project was ambitious for the funding we had, and an alternative method should have been pursued. At this stage, plans for completing this project are still in the midst of being devised and will likely be transformed and shaped by the opportunities presented by ACDIP's school project.

Yet despite these criticisms, the key achievements of my work in Guatemala has been to begin to build long-term trust through reciprocity and some degree of accountability. Though insufficient, the communication I currently maintain with NGO staff in Guatemala better facilitates the continued contributions of my skills, and sustains my presence to some extent as they make plans for future projects. Furthermore, I believe that my work has largely avoided the pitfalls of further reproducing social and economic reification. Where some Development projects may appear to be bold, action-oriented, and "successful" (as deduced from the terms of its

own "Logframes" and "Monitoring and Evaluation" metrics), their ability to facilitate the further entrenchment of colonial structures, or indeed reverse the progress of other Development efforts remains a cautionary tale.

2.3 Discussion & Conclusion

Although my assumptions about the utility of a digital library application were misconceived, my experience coding in Guatemala did reveal at least one striking observation: that there is a specific character to the apparent digital (il)literacy amongst organizers at ACDIP (as well as those at ProPetén); this is noteworthy in a period where the role of information technology is not only increasing in rural Development, but potentially transforming the epistemological outlook of the industry. Here, it should be noted that the term "digital literacy" is rather incapable of capturing my intent. It is not that Q'eqchi' organizers underutilize or overlook the prowess of information technology or, for that matter, quantitative analysis. Rather, the contours of information technologies are conceived differently between ACDIP staff and higher echelons in Development. The ACDIP staff are intimately aware of how important digital technology is to the work of Development—evident in their reliance on e-mail and WhatsApp for communication, as well as Excel and Word for grant proposals, accounting, and reports. However, they (rightly) prioritize their time and analysis in other pursuits relevant to their communities—in other words, the content of those communications. Yet, a discrepancy between the Development apparatus (inclusive of corporate actors) and Q'eqchi' organizers may become an encumbrance as the former moves further toward an epistemological determinism that elevates some types of data over others (namely, over the type ACDIP utilizes). For instance, Dalton et al. (2016) describe the appearance of a

Big Data-centric approach to Development by both non-state actors like French

telecoms, as well as the United Nations (e.g. their Global Pulse program). Indeed, as

these authors relate, the contemporary emphasis on information technologies and Big

Data present considerable analytical problems stemming principally from problems of

representation. Dalton et al. (2016) highlight Big Data's amplification of the "Land-

Rover research" problem which is described as an approach where Development agents

inadequately conduct fieldwork in the form of short visits taken by air-conditioned

Land-Rovers; however, Big Data facilitates researchers and Development agents from

leaving their metropolitan offices altogether in their pursuit of Development knowledge

—further stratifying the production of knowledge as addressed in Part I.

  The above observation has a number of important consequences in my work. It

has shifted my focus toward a critical analysis of information technology and, as a

corollary, quantitative analysis. I argue that the way out of "underdevelopment" is not

through technological innovation, but that some engagement with information

technology must be considered given the rising availability and changing character of it.

Despite the long history of Mayan struggles incorporating internet communications like

the Zapatista uprising in 1994, information technology still yields new terrains for

Indigenous organizers to navigate and process. Further, I not only argue that a renewed

engagement with the problem of representation is necessary as detailed in Part I, but

also the related point that the investigation of the organizer–technology interface with

which it is entangled may be a revealing pursuit. Following this proposition, I see my

role (in Development) centering the partial mediation of encounters with actually-

existing information technologies[9] and their use to counter hegemonic epistemologies.

In so doing, I see the utility of drawing on the work of Critical Cartography, Critical GIS,

Critical Data Studies and other emerging work in Digital Geography that center these

questions without completely withdrawing from the application of these technologies

(as exemplified, for instance, by the practice of counter-mapping). Thus, this renewed

engagement moves beyond the endless cycle of critique by aspiring to co-construct novel

re-conceptualizations of actually-existing information technologies with Indigenous

organizers.

In practice, I am now attempting to apply a Critical Data approach to official

census data from the Guatemalan census bureau, Instituto Nacional Estadística (INE).

Here I am interested in extending some of my capacity to navigate census data with

ACDIP staff through creating an interactive web application that utilizes both

participatory and exploratory spatial data analysis frameworks (see Appendix I).

Although the most recent complete census by INE dates back to 2002, the government

agency is currently finishing their work on releasing an updated census (of lugares

poblados, or populated places). In anticipation of its release and the impact it will

undoubtedly have on the Development industry in Guatemala, I am attempting to not

only spatially represent the census data in the form of a web map, but pair it with

contextual information in some effort to raise the attention of data explorers to the need

of integrating thick descriptions (i.e. qualitative data) emanating from fieldwork into

their analyses. In the elaboration of this web application and by juxtaposing the work of

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[9] I use "actually-existing information technologies" as a point of contrast with techno-utopian Development imperatives that suggest that by solely addressing the technological components of development, positive social change will follow.

ACDIP against the narratives produced by the census, I believe it would be possible to assert the need for the critical on-the-ground fieldwork and relational labor that ACDIP has demonstrated time and again. Although far from complete, this work follows the trajectory of my interests as I consider future projects, including an upcoming community mapping project with Dr. Liza Grandia, and as I develop a proposal for a PhD project.

In this paper, I have attempted to demonstrate the problematics of representation and sketch some guiding lines toward working through its contradictions. In this illustration, I underscored the importance of linking theories of the subaltern from Postcolonial Studies with the obligatory agreements of reciprocity and accountability from Indigenous Studies in order to overcome the isolation, recursion, and domination of the hegemonic epistemology of the Development apparatus. I then outlined the key projects I conducted in the last two years with an Indigenous Development NGO in Guatemala, ACDIP. Through a reflection of these projects, I retraced the problems of representation in my practice and recounted an observation of the nascent digital divide between Development and organizers at ACDIP. Finally, following critical work in mapping and data studies embedded in geography, I suggested further opportunities for research and development through a participatory exploration of data.

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雨にもまけず. *Ame ni mo makezu.*

Appendix I

The following is an excerpt from my work on creating a data visualization web application for the exploration of 2002 census data from the Instituto Nacional Estadística (INE) of Guatemala. It describes the Methods, Results and Discussion from my 2019 term paper for the course CRD 298: Spatial Methods in Community Research instructed by Noli Brazil. Following this work, I continue to develop the web application following a more simplified approach to Exploratory Spatial Data Analysis (ESDA). ESDA may be described as the initial step prior to any advanced statistical analysis (O'Sullivan & Unwin, 2010, p. 2). These latter efforts have not be documented in this Appendix.

Methods

Although the primary intent of this project was to draft a web application for data exploration, the matter of organizing the statistical tools for the exploratory analysis requires curation and thus decision-making around the purpose for each option. In this manner, this study investigated two related questions that directs the tools that may be included: whether interpolation methods can estimate values for communities (i.e. census places) with no demographic data; and whether clusters can be detected in the spatial demographic data provided by INE. The intent of the latter was to understand both spatially dependent characteristics of communities, and identify central hubs for information dispersal.

In addition to running any analyses and presenting canned results to the partner NGO, this study utilizes methods from geovisualization to produce an interactive

approach to exploring and investigating spatial data from the 2002 census. Thus, this study produced a web app utilizing the functional programming language R concomitantly with the R package Shiny. While the web application is still undergoing development, the intended final deliverable will provide an interface for the partner NGO to utilize in data exploration.

Interpolating Population Data

Spatial interpolation is a method to estimate values at an un-sampled location based on some locally weighted sum of values at sampled locations (i.e. control points or locations with known values) (O'Sullivan & Unwin, 2010, p. 234). In this case, the sampled locations are villages with demographic data from the 2002 census and the desired estimated values are for known villages that lack demographic data, or equally, NGO member villages that do not appear on the census. While there are many simple deterministic[10] approaches to interpolation, such as inverse distance weighted interpolation, geostatisticians argue that the use of statistics over simple mathematical approaches better accounts for errors in measurement and available knowledge of spatial behavior (O'Sullivan & Unwin 2010, pp. 278-9). Therefore, this study utilized kriging as a method of interpolation in order to make best use of available data by combining some of the underlying concepts of inverse distance weighted interpolation with trend surface analysis which makes use of linear models (O'Sullivan & Unwin, 2010, p. 294). In this study, kriging was implemented with two formulas: population by geographic location, and population by geographic location and distance to a major

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[10] In other words, using a specified mathematical function (O'Sullivan and Unwin, 2010, p. 278).

roadway. These formulas were then tested with a variety of transformations including square-root and logarithmic transformations.

Identifying Clusters

The use of statistical learning for the purpose of studying interesting things about measurements or to detect sub-groups is known as unsupervised learning. As there is no response variable, there is no universal method for validating the results. However, unsupervised learning remains a useful tool for exploratory data analysis (James et al., 2013, pp. 373-4).

The process of identify clusters or groups in spatial data may involve any number of variables and in many possible combinations. One approach would be to cluster villages both geographically (with respect to their locations in El Petén) and by a number of demographic variables, such as the percent of Mayans in each census place. In this approach, a dissimilarity-based homogeneity criterion, such as demographic data, is constrained by a contiguity constraint (i.e spatial contiguity) (see Chavent et al., 2018). However, in the elaboration of this method, a mixing parameter α (i.e. a weight) must first be determined. Due to the advanced techniques involved in this method of clustering, a more simplified approach was pursued in this study.

Both the above mixed clustering method and the method implemented in this study make use of a broader approach known as hierarchical clustering. This approach, alongside others like k-means, is a clustering method found in unsupervised learning. Hierarchical clustering differs from k-means primarily as it produces a dendogram graph with no predetermined number of groups (James et al., 2013, p. 390). Unlike the mixed clustering approach defined above, this study makes use only of geographic

clustering. However, a number of hierarchical clustering methods were implemented in

the web application to allow some flexibility in the performance of the cluster

definitions. Namely, users of the web application may alter the number of clusters

produced by changing the level on the dendogram at which to cut, and depending on the

hierarchical clustering method selected, users may also choose a distance at which to

delimit what points count as a neighbor (the default is 5 km).

Spatial Autocorrelation

Beyond hierarchical clustering, this study investigated the overall presence of

spatial dependency in the data in terms of the demographic data. Both global and local

statistical approaches were utilized to estimate spatial autocorrelation. As the clustering

methods described above do not account for autocorrelation in the demographic data,

the global Moran's I and Local Indicators of Spatial Autocorrelation (LISA) were

important to determine if the portrayal of demographic data in a manner that implied

the presence of spatial autocorrelation could be justified. In other words, in the

depiction of clusters (based solely on geographic location), percent Maya is portrayed

using a gradient; this indicates on an intuitive level that spatial autocorrelation is

present. In order to provide some minimal accuracy to this crude depiction, the percent

Maya must demonstrate spatial dependency.

Network Theory

Following work conducted in the field of network theory, this study utilized a

network flow model to investigate census places (i.e. towns and villages) in El Petén.

Network theory provides researchers with an approach to consider the consequences of

network phenomena (Borgatti & Lopez-Kidwell, 2011). The network flow model, one of

many models postulated by network theorists, provides a framework for studying the capacity of networks to carry information or other resources over a series of nodes and paths (Borgatti & Lopez-Kidwell, 2011).

As the purpose for this study was to compile various descriptive tools to illustrate potential locations of intervention for community development, a manner in which to capture the importance of one village over another was deemed critical. Indeed, much of the work of development centers the communication of ideas and knowledge in some form, and thus a model that conceptualizes paths between nodes as means to propagate information provides a constructive scaffold upon which to optimize the selection of potential loci of coordination.

In the case of this study, census places are nodes, and either geographic distance or the strength of a demographic variable between two census places are the edges. While it is possible to use normalization (e.g. feature scaling) to indicate edge values based on both geographic distance and the composite strength of a demographic variable, some mixing parameter must first be selected (much as the matter of α in the section on clustering above). However, without further indicators, it is difficult to select an objective parameter, and thus users are left with the choice of choosing between either geographic or demographic variables as the edge values.

Much of the power of network theory lies in the ability to assess characteristics of particular nodes by selecting some measure of how "central" the node in question may be. The matter of identifying or even defining centrality remains an evolving topic in the network theory literature. Indeed, given the dizzying array of definitions, it is important to identify a centrality index which is appropriate to the research question (Zweig 2016,

243). Thus, rather than restricting users to a single method of determining centrality, several approaches were provided in the web app, including various measures of degree, betweenness, and connectivity. Alongside other forms of documentation, some criteria for selecting a measure of centrality will be provided in the web app.
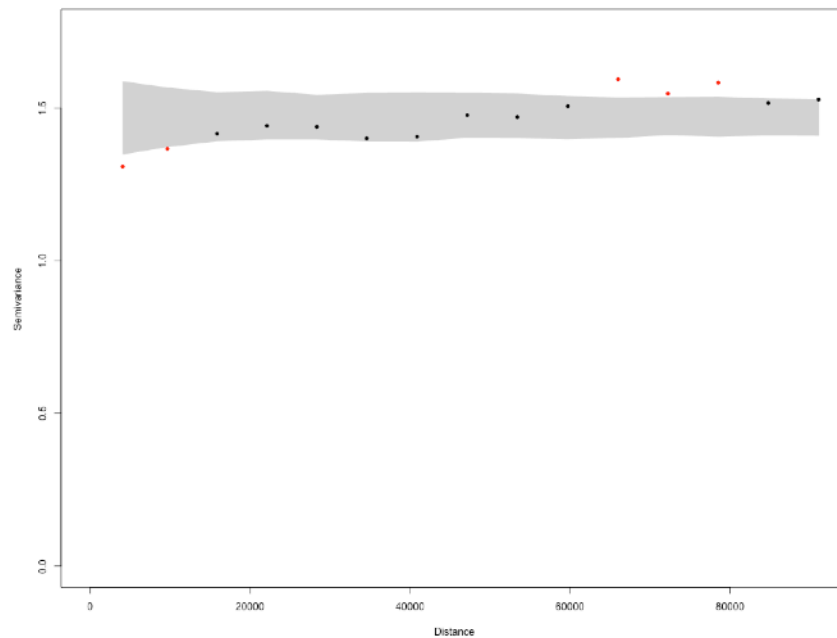

Figure 1. A semi-variogram produced through 499 iterations of a Monte Carlo Simulation calculated by `envelope` from the {variosig} package . Note, five of fifteen points lie outside the 95% envelope.

Results & Discussion

Interpolation with Kriging

No fit line was determined for the semivariogram generated by the two models: population by geographic location, and population by geographic location and distance to major roadway (see Fig. 1). Thus, any attempt at interpolating values for un-sampled locations was pre-empted as the results would not be significant. Further, exploratory

spatial analysis similarly yields inconclusive results. The Global Moran's I was estimated

to be 0.128 (999 simulations with p << 0.05) which suggests only weak clustering. A

map of Local Indicators of Spatial Autocorrelation for population demonstrates only a

handful of population hotspots (Fig. 2). These measures may suggest that there is not

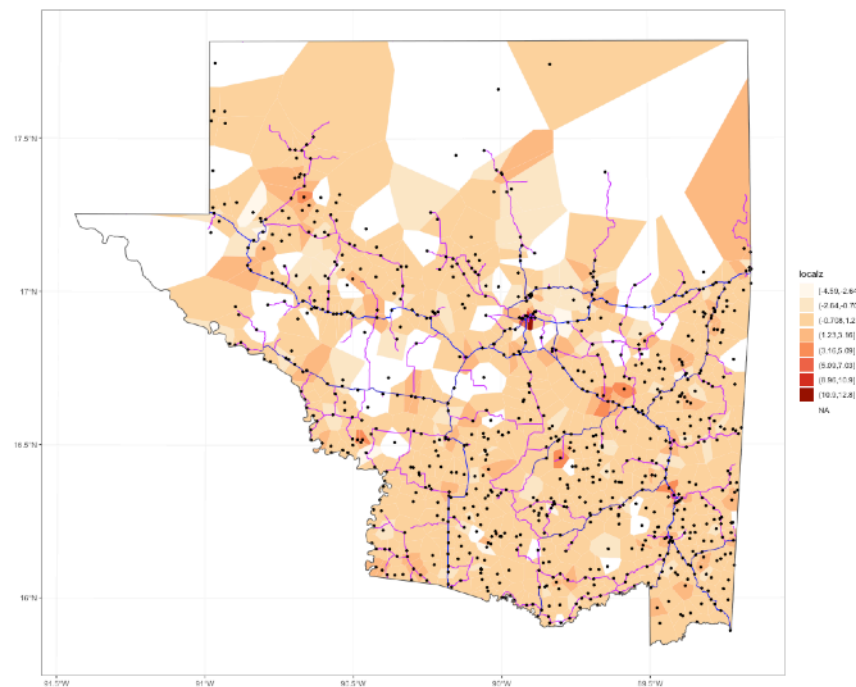enough data or evidence for a pattern for the purposes of interpolation.

Figure 2. Map of El Petén using Voronoi tessellation to depict z-
scores of local spatial autocorrelation of population values
calculated by `localmoran` from the {spdep} package.

Spatial Autocorrelation

Where population clusters may only been weakly present, the clustering of *Maya*

populations was more clearly evident (Fig. 3). The Global Moran's I for Mayan

population was estimated to be 0.594 (999 simulations with p << 0.05) which exceeds

0.3 threshold, suggesting the presence of strong clustering. Figure 4 demonstrates

Mayan population hotspots using Local Indicators of Spatial Autocorrelation. These
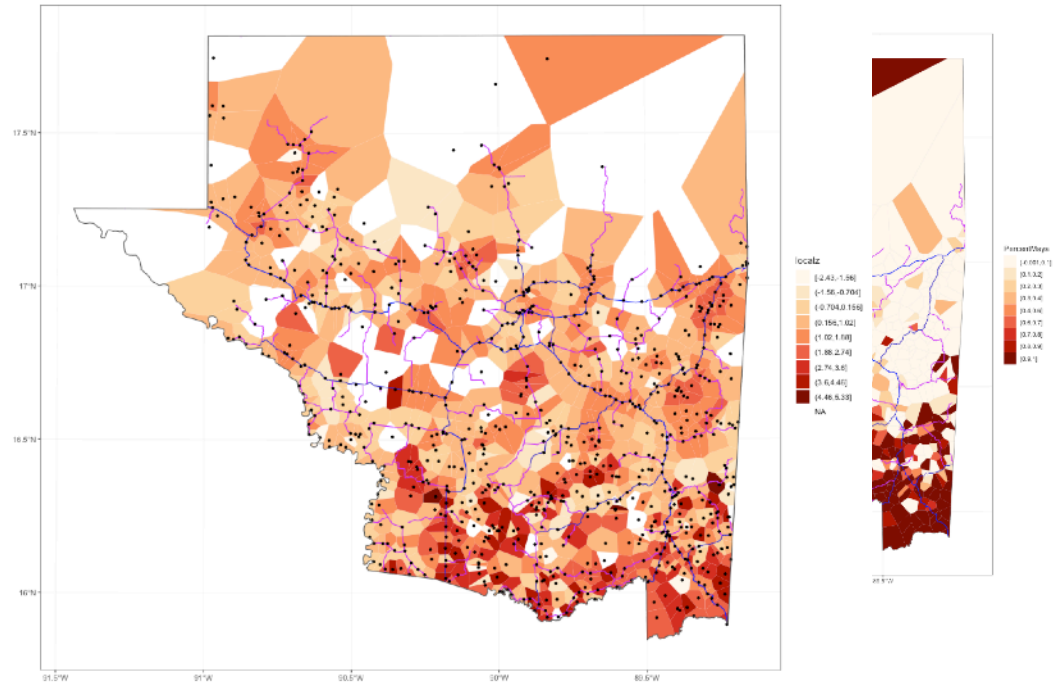
Figure 4. Map of El Petén using Voronoi tessellation to depict hotspots of Mayan populations.
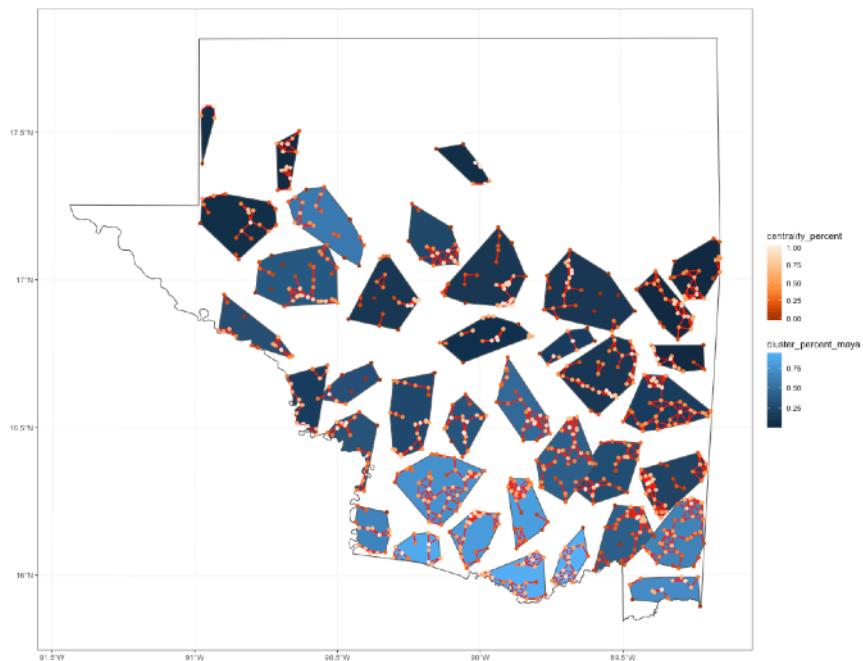

Figure 5. Map of El Petén, with 40 clusters (blue) created using geographic hierarchical clustering, with within-cluster networks at 5km. Nodes are colored (orange) by degree centrality.

results suggest that while populations do not cluster, other demographic data like percent Maya is spatially contingent. Given the limitations of the hierarchical clustering approach selected in the web app, it was not possible to fully integrate the demographic data in the selection of clusters. However, as described previously, each cluster does indicate a score for the percent Maya. Considering the statistically significant estimate for the Global Moran's I we can reject the null hypothesis. Moreover, depicting some implication of spatial dependency for Maya populations is thus justified.

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