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## **Bridging Urbanization: Framing Sustainable Development through the Urban Political Ecology of *Estero de Sampaloc***

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### **ABSTRACT**

*The city of Manila was at the forefront of urbanization in the Philippines for decades. The acceleration of progress cemented the way for its infrastructure development and the large influx of individuals aspiring for more lucrative opportunities in its growing commercial avenues. However, the city, one of the first to urbanize in the country's history, has lagged in its capabilities to address overarching environmental issues compared to newly sprouting urban metropolises at its periphery. The study aspired to highlight the human practices and discourses revolving around the problem-fraught setting of Estero de Sampaloc that caused the metabolic rate of urbanization in this area of Manila to evolve not just in its physical environment, but also in its political and economic conditions as well. Furthermore, the research was performed to showcase the different interactions between humans and their environment, and the implications it induces to the formation and adaptation of hybrids. The study employed Anna Zimmer's framework on Urban Political Ecology which lays its foundation on societal factors that affect the environment. In order to apply this, the research used qualitative methods which conducted key informant interviews and sets of focus-group discussions with various stakeholders of the estuary. Results disclosed that the interaction of residents with their environment and the historical development of discourse involving the estuary within the community, has significantly contributed to how the estuary devolved and developed through the course of time. The study recommends the use of its framework and analysis to other environmental settings.*

*Keywords:* political ecology, urbanization, hybrids, metabolism, discourse

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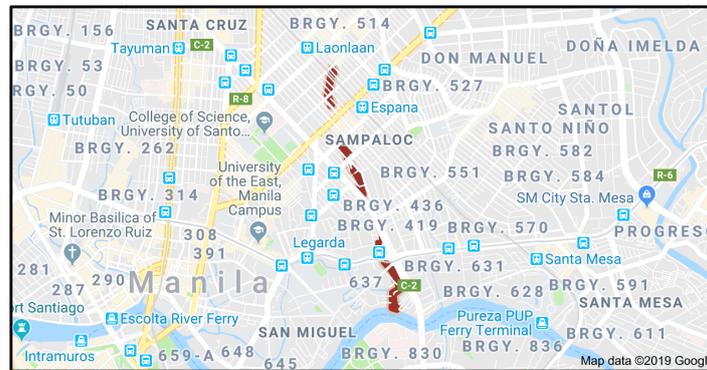
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## INTRODUCTION

The Philippines is an archipelagic nation well-endowed with diverse and rigid elements, from abundant natural resources to seasonal meteorological extremes. Given its geographical attributes, etched in its landscape are multiple waterways and tributaries that often serve as sources of human biological necessity. Man's usage of these waterways may range from being a reservoir of potable drinking water, a viable way to produce food, and alternative way of irrigation (Food and Agriculture Organization of the United Nations, 2017). While waterways could have been a viable form of sustenance, it is invariably susceptible to the accumulation of hazardous wastes and contamination - possibly causing immediate danger to various life forms in and around them. These bodies of water are naturally fortified by perennial and rooted plants such as trees, shrubs, and other verdures to prevent flooding and land submersion. Vegetation presence in the ecology of the area is essential in evading the erosion of sedimentary minerals which could act as obstructions that hinder its natural flow. However, as communities began to settle near the resource pool, commercial demand exponentially grew which expanded residential land and industrial establishments along waterways (Liyanage & Yamada, 2017). It effectively caused an influx in the concentration of population in the area and with this, a large percentage of the natural agents used to fortify the skirts of the waterbody were destroyed or debauched to pave the way for urbanization (Liyanage & Yamada, 2017). As more residences were established and the sudden rise in population caused inequitable density, various wastes and toxic substances such as fecal and urine matter, animal manure, and discarded food scraps and insoluble, non-biodegradable particles obscure and overflow the water system (Liyanage & Yamada, 2017). The lack of apt irrigation systems and technology to decontaminate such pollutants has left the waters in a state of stagnancy making it vulnerable to flooding during precipitation and heavy downpour.

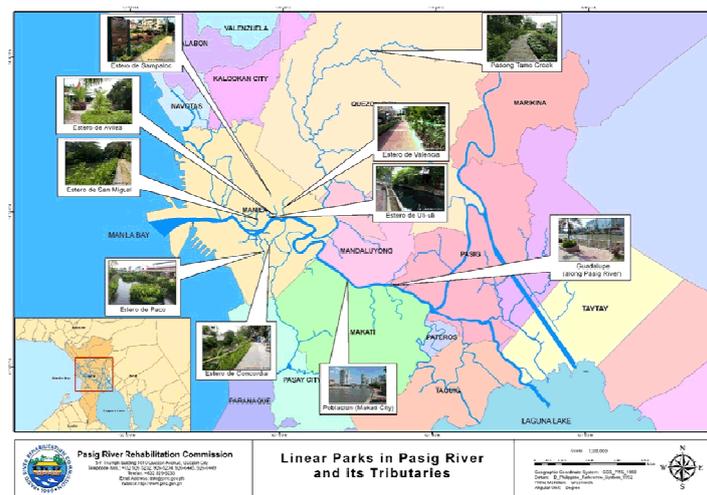
Manila is a dense city with a large number of overpopulated areas and a continually increasing grade in population growth; whether from high birth rates or from people relocating for profession (Philippine Statistical Authority, 2016). This puts severe pressure on natural and man-made water systems that are unable to cope with the fast-paced environmental damage and degradation (Manila Bulletin, 2018). The ability of the waterways to mitigate itself is challenged by the amount of waste generated by residents and workers in the city. The common water systems such as major or minor rivers and creeks have become alarmingly polluted. Its capability of water passage and circulation is impeded to an extent that at some areas of compound viscosity, especially in times of rainfall, flooding is inevitable. Commuters, students, and some residential owners are severely affected and must routinely suffer the consequences of unreliable irrigation and man-made disasters generated by these dilemmas (UNICEF, 2009). Thus, the government and its citizens' discipline and

participation are required as a cooperative responsibility to replace ineffective, *Band-Aid* solutions and sustain long term maintenance in order to alleviate the human experience of the Filipino’s urban life.



(Figure 1 - Map of Estero de Sampaloc)

*Estero de Sampaloc* (see Figure 1) is located in the middle of Lacson Avenue, along the streets of Fajardo, Carola, and General Geronimo where it sits in Sampaloc, Manila (PRRC, 2014). The city of Manila is dotted with a number of estuaries that often serve as a tool for flood control and regulation. Although, estuaries or *esteros* are commonly natural, fresh bodies of water which finds its source from rivers and lakes, there are some which are entirely man-made—used as extensions to create a simulation of the same effect of flood control as its natural counterpart (PRRC, 2014). However, it is still imperative that constant maintenance, restoration, and development must be guaranteed to keep the city’s flooding in check and its programs on environmental health effective. Moreover, with its residential neighbors and the risk it presents if unmaintained, the reality of the situation is much more drastic.



(Figure 2 - Map of the Pasig River)

Water flowing from this man-made 1,139-meter canal finds its base at the *Pasig River* (see Figure 2) with its forefront commencing at S.H. Loyola Street, and flowing

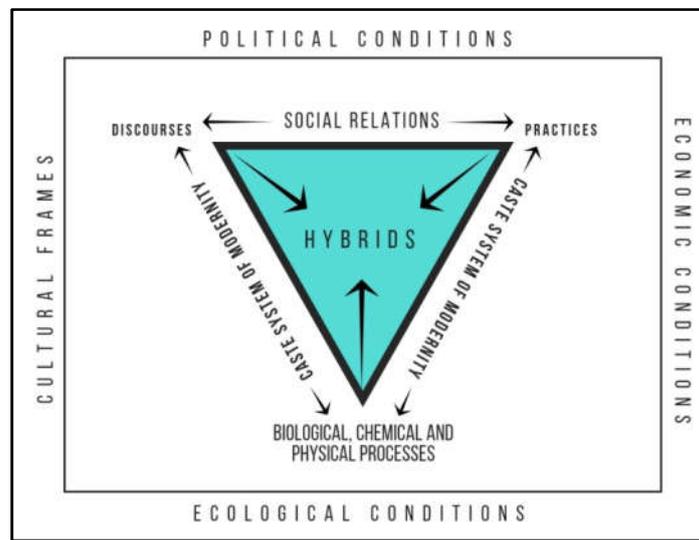
midstream below the street of Nagtahan (PRRC, 2014). The *estero* flows farther downstream where it ends at Arsenio Lacson Street, forming a conjunction with *Estero de Aviles*, another conjunction of the waterways. Its surrounding environment consist of residential, commercial, and industrial establishments—to which, the sewage and irrigation water system of said establishments and residential units generally flows onto *Estero de Sampaloc*; dangerously untreated. A study conducted by Professor Jose S. Hilario, published in the International Journal of Environment and Pollution Research (IJEPR), discloses that the water quality in *Estero de Sampaloc* was devolving and deteriorating due to unaccountable and unsanitary practices from the creek's contiguous residents, including the various business establishments within its vicinity (Hilario, 2015). It was discovered that solid wastes have come directly from domestic origins and are being frequently, indiscriminately, and discreetly discarded unto the *estero*. In addition to this, some informal settlers residing along the *estero* disproportionately and directly contributed to the pollution and stagnation of the water body by utilizing the system as a public bathing area and a lavatory. On June of 2015, the Pasig River Rehabilitation Commission (PRRC) along with the local government, and a budget of *Php 2,347,838.07* coordinated and administered treatment and rehabilitation for *Estero de Sampaloc* and *Estero de Valencia* (PRRC, 2014). The procedure which lasted for a year, was done by conducting a riverbed dredging, desilting works, and riverbank development while relocating approximately 400 informal settlers. Decontaminating and desilting the river was an arduous task which often involved concerted efforts of convincing, persuading, or in extreme cases coercion (PRRC, 2014). Efforts similar to this slowed down the relocation and rehabilitation of these families—mostly already composed of informal settlers. The year-long program has produced healthier and more sanitary tributaries at the expense of adjusting budget for relocation. The local government has also been recently more perceptive on the implementation of various projects that would help towards a sustainable and manageable health for the estuary.

The design of this study was to analyze the interactions and relationships between the man-made tributary that is *Estero de Sampaloc* and the citizens living along the creek; ultimately capturing the discourse behind it. The study's objective was also geared towards how abstract phenomena such as the economy, culture, and politics directly affected the material world which, in this case, is represented by the estuary. The study then, should revolve around these questions in order to paint a clear picture of how networks of interactions work in an isolated case that the community and the specific environment have. Thus, the foundations of the text stemmed from its main question: *How does the interaction among the stakeholders of the community near the estuary namely: (1) the residents, (2) the local government, and (3) the environment itself— affect the condition of the estuary?* In order to execute an apt discussion, the question was divided into sets of thematic inquiries. The following thematic inquiries were: (1) How does the relationship between the local government and the citizens affect the condition of the estuary?; (2) How does the economic condition of the barangays affect the

condition of the estuary?; (3) What preconceived cultural behaviors of the residents near the estero that affect the estuary?; and (4) To what extent does human behavior affect the metabolism of the environment? Each question presented various aspects of the environment and its stakeholders that would frame and classify the network of interactions observed. This was also accorded to the chosen theoretical framework that served as a logical guide to the research under the field of Urban Political Ecology (UPE).

The study hypothesized that the culturally integrated interaction of citizens with local and national government policies on their environment, has increasingly deteriorated the urbanization of the estuary. This is due to a lack of proper communication avenue between citizens and those in authority; it is also due to the negligent and apathetic behavior of both the authorities and the estuary's residents. The behavior wrought from both the residents and the local government would have been agitated by their lack of care and inattention. This negligence, whether intended or not, was caused by their lack of knowledge and consciousness on the significance of their behavior and attitude towards the environment. *Thus, the residents' failure to comply, caused by their culturally integrated habits and practices, to the public policies implemented by the LGUs in order to sustain the development of Estero de Sampaloc directly contributes to the recurring degradation of the estuary's condition.* The statement was used as the main hypothesis of the study and the basis to the inferences made beforehand. The scope may be broad, but the execution of the research was isolated to a specific community for a more accurate portrayal of the role discourse played in the process.

## METHODOLOGY



(Figure 3 - Anna Zimmer's (2010) framework on Urban Political Ecology)

The focal points of studies with this type of process are the hybrids that subject phenomena create from both natural and man-made. In Foucauldian discourse, an object can be defined only in the way that humans attribute meaning to it (Foucault, 1972). When the estuary is defined and framed in a particular way and in relation to how the people would employ it, the estuary *becomes* it. Such is the basis for this research's analysis, where man and environment promote the reality and objectivity of something by how they themselves would interact with it. According to Latour (1993), hybrids are mixtures of nature and culture. This may vary in terms of interaction between the variables, at times caused by the reaction of one interaction to another. As Swyngedouw and Kaika (2014) suggest: "the urbanization of nature is extensively multi-scaled and spatially net-worked." However, as the illustration suggests, there are thematic boundaries which limit, affect, and develop these interactions. There could be political conditions subject to certain variables or cultural frames which conduct elements of the study to specified norms and trends; economic conditions that inevitably shape and affect the reactionary process of a phenomenon; and ecological conditions which acts as a pivot that could shape human interaction. These boundaries are the definitions of a phenomenon and may often determine the extent and type of interaction deliberated by the social conditions of a society. Hybrids are formed by cultural, material, biological, and ultimately *natural* practices of actors reflecting the relationship with other variables (Zimmer, 2010).

Observed in the illustration above (see Figure 3), several elements are considered and even non-human actors were taken into account and acknowledged by the approach. According to Swyngedouw and Kaika (2014), "each of which express particular power relations and geometries and where struggles for the control of, access to, and

*transformation of nature and the distribution of ecological goods and bads are carefully, yet intensely, negotiated and fought over.*" Interaction between social relations together with the discourses of individuals, and in some cases, the *natural* processes originating from biological, chemical and physical treatment, would ultimately affect the condition or state of the estuary. All these exchanges invariably contributed to the metabolism of the area which dictates the urban sprawl of a region. The arrow then represents the direction and exchange of an interaction and more importantly, the nature of the interaction indicated with it. This framework created an understandable perspective of the holistic development of the environment in the lens of human interaction and discourse. This is later on presented and narrated through the analysis and discussion which utilized Michel Foucault's archeological approach. The approach proved to be the appropriate method due to its befitting nature of archiving and chronicling historical themes that have developed over the course of a phenomenon. This framework has provided this study a frame of reference through which one can observe the interplay of intangible ideas and information with that of tangible figures and objects. The theoretical framework is designed around the interaction of the stakeholders of the study being: (1) the residents living along the *estero*; (2) the local and national government; and (3) the physical conditions of the environment itself. The *box* delineates the type of interaction that is taken place, referencing to its nature. The *triangle* found in the center of the framework exhibits the results of those particular interactions which are designated as *hybrids*. Urban political ecology understands the processes of these interactions by articulating the power relations demonstrated by the social relations of the stakeholders with the environment. This postulates that discourse, practices, and chemical processes are essential to map out the inherent political ecology of an urban setting. The frames support the study by limiting and classifying the type of interaction stakeholders are insinuating. This form of structured categorization makes the study more efficient in determining the whole political ecology of the area.

The *arrows* surmount to the possible interactions directed to a specific stakeholder with the consideration of the *caste system of modernity* and how it affected the process. The caste system of modernity, according to Anna Zimmer (2010), is simply defined as the *power relations* demonstrated among stakeholders; which suggested that other aspects such as economic standing has directly affected it. This framework will aptly consolidate the different aspects of interactions and would be appropriate for the study of hybridization in the field of urban political ecology. The framework has proven to be an effective tool in categorizing and analyzing the observable phenomena of interactions. By creating classifications of various interactions, the study was able to lay out the networks of activities that may directly or indirectly affect the social and physical environment of the people and the other stakeholders.

There are numerous implications of this study to the practical arena of the field. The study may assist lawmakers in creating sound policies that may better address the sustainability of rehabilitation projects. This may especially be applied to specific areas of estuaries and tributaries of polluted and stagnant major waterways. The small

networks of the water systems are a vital component of major rehabilitation projects in the Philippines. The clearing of the estuary is commonly first stand of these environmental projects and as shown in the Pasig River Rehabilitation Commission's declaration of budget and expenses, it is a very costly one. The budget is annual because maintenance is a necessity to the estuary. If left unsupervised, it has been a known problem to inexorably revert back to its degraded state, even before the rehabilitation happened. This study will not only assist in policymaking but would also provide an avenue towards understanding the fundamental causes of environmental deterioration in these settings. The research may significantly add to the body of knowledge in terms of what Urban Political Ecology has in its current table. But this study may do more so by bridging the gap that most ecologists would have when theories, which often serve as pillars of policy actions and decisions, do not meet the practical world. Thus, aimed at calibrating its findings to real policy.

The research studied a phenomenon common in urban settings that are severely and densely populated. It attempted to understand such developments and the interaction within the community. The research particularly used a number of methods together with theoretical and real-time data. The study of Urban Political Ecology is admittedly still in its formative years, where in-depth and specified sets of methodical research and analytics are still relatively new. However, its engaging applications and substantially retrieved data often goes beyond the discipline itself, making it a promising field of social inquiry. There are no known papers or any form of research, as far as researchers are capable of reviewing at the time, who were able to expose analytically the development, interactions and societal relationships of the *estero* and its other stakeholders. No other research had been found by this study to have been able to correlate the significance of the political system and sociological atmosphere of an *estero* in the Philippines' setting, specifically. One of its most prominent contributions to the area of study, then, has been that the research has successfully shown how the interactions between authority figures with the rest of the population, and the mode as to how this interaction is carried out have a direct effect to a small yet very significant body of water. The political ecology of an isolated estuary - correlated to its situation would then bring to the table a consideration of approaching problems that lack effective solutions in administering environmental policies which determine the trajectory of sustainability in the perspective of Urban Political Ecology (UPE).

The study may serve as an avenue to a more systematic method of creating better suited policies in effectively treating environmental problems entrenched in a community's culture. Not only has this study been able to provide an answer, or a crucial standpoint in the least, towards what makes specific environments sustainable, but it may have also shown a ubiquitous and all-inclusive solution that may be applied to the study of other bodies of water – or to an extent, other environmental settings. The study may encourage future researchers who may encounter this area of the Political Science discipline to utilize the *bottom-up approach* in UPE. It will prepare and encourage further studies to turn its attention towards local urban environmental matters and may

provoke further the *raison d' être* of other researchers to address the problem of Filipino apathy concerning socio-environmental issues. Theoretically, a number of contributions from this study may prospectively aid in commencing further research of the same phenomenological nature. The study used the genealogical approaches in studying interaction and development of an environment. When effective in gathering and analyzing a wide range of ethnographic data, the method may further be considered as a staple in the study of urban political ecology. Furthermore, this may enhance and expand the area of study—especially in the general study of Urban Political Ecology and why theoretical frameworks of UPE should be applied in urban studies. Since the data are all contingent by nature, it invites other future researchers to supply more information, without disclaiming the validity of the facts it discovered. This study aimed to lay the foundations for a type of research that utilizes history through the lens of socio-cultural development of communities and how this can directly affect the way policymakers have been framing sustainable development.

However, the study is in itself ambitious, as it planned to capture the nature of a man-made environment in its common state, which in these cases, are more often than not left deplorable. If one considers the bulk of the entire metropolitan waterways with the numerous major and minor rivers and esteros varying in shape and size, and coupled with the practical limitations the researchers of this study holds, then one confronts the obvious fact that the broadness of this research as a whole, is in the right amount of feasibility and relevance. Thus, the research had only focused on one tributary that would house within its area a community to capture the history or development of the waterway through the respondents' perspectives and cultural practices. The research also included the local government units that administered policies concerning the estuary that could shape its conditions. Furthermore, the research had also involved major national projects done directly on the area. The parameter of this study lies in its attempt to explore the relevance of the political system and the sociological atmosphere to the estuary only or exclusively, of *Sampaloc, Manila*. In order to maximize this research's accuracy, its scope has been minimized and well defined. Therefore, this research transpired on the area of immediate proximity of the estuary, specifically: (1) *barangay 434*, (2) *barangay 432*, (3) *barangay 429*, and (4) *barangay 455*. This study focused on the history of the estuary, and emphasized its rehabilitation on the years of 2014 to 2018, partly due to available public records. Another limitation which this study has to withstand came from the fact that the researchers had to rely on limited access to financial resources, limited time, and continuous first-hand experiences with the estuary, central to this study.

The main perspective of this research utilized Urban Political Ecology, as explained in-depth by Mohammad Tanzimuddin Khan in his work, *Theoretical Frameworks in Political Ecology and Participatory Nature/Forest Conservation: the Necessity for a Heterodox Approach and the Critical Moment*; it branched out from Marxist tradition and may differ from one another depending on how the scholars using it make use of different concepts of power in order to interpret the human, society, and nature

relations, and how they tend to favor one particular perspective over the others (Khan, 2013). Rather than dealing with the issue of power-relations in human and environment relationships, the article claims introduction for the concept of a “critical moment” in political ecology analysis (Khan, 2013). This concept is defined here as: “A conspicuous and sensitive moment that offers a specific insight into the interplay and autonomy of the actors involved in an event, one that illustrates or informs a political ecology analysis” (Khan, 2013). The study contained the same ideas as this research, with the inclusion of power-relations found to be inherent and significant in the locale.

### *Urban Political Ecology and the City*

Hillary Angelo and David Wachsmuth, political ecologist thinkers, wrote in their work the *Urbanizing Urban Political Ecology: A Critique of Methodological Cityism*, the defining features of Urban Political Ecology as “a framework for retheorizing the city as a product of metabolic processes of socio-natural transformation” (Angelo & Wachsmuth, 2014). The study also discussed the evolution of the ideologies applied in UPE through its history. It divulges on how there are two contentions in the study of the field. One where the city dominates as a focal point in analyzing ecological phenomena, while on the other where the process of urbanization in any location should set the agenda for discussing the implications of the theories that urban political ecology has used. Another study published in the *Annals of American Association of Geographers* by the same authors entitled *Green and Gray: New Ideologies of Nature in Urban Sustainability Policy* (Angelo & Wachsmuth, 2017), has divulged to the research the notion of green and gray urban nature. Green urban nature, as postulated by the authors, are determined to be the ‘return of nature to the city’. Whereas gray urban nature is defined as ‘the concept of social, technological, urban space as already inherently sustainable’. The journal gives its insights through the development of a ‘greening’ infrastructure scheme in post-industrial Germany. This gave the study a clear distinction on what is to be considered as, if applied, the appropriate approaches to the politics of urban sustainability.

### *Research Design*

In the attempt to understand the urban political ecology of *Estero de Sampaloc*, the study approached the problem in the manner of *qualitative* research and probing. The feasibility of the study relies on the specific *locale*. Isolating the area of observation to one community, which encompasses an estuary, will provide a comprehensive and detailed observation regarding phenomenological inferences made beforehand (Forsyth, 2003). Through the qualitative appraisal and examination of socio-political interactions between humans residing within and around the vicinity of the estuary and the environmental condition of the said waterway, the study duly aims to ascertain how the politics of these communities inevitably shape environmental problems and conditions; and to an extent how anthropological, historical, and geographical factors contribute to the urban political ecology of the area in question. A *genealogical method*

was also administered to properly analyze these socio-political facets of the results (Robbins, 2012). To further support this and in consideration of the eclectic nature of Urban Political Ecology (UPE) studies, an additional method was applied to establish an ethnographic foundation for the subject—discerning traditional norms and linkages within the community which may affect political behavior. The *case study* method was found to be the most compatible approach for a more isolated and focal observation—partly due to the study’s nature and its need for thorough research and articulation. The study highlighted the interaction and management of the environment by human societies—in particular the residents and the local government overseeing the estuary. The research highlighted the reality that *EsterodeSampaloc* has been previously rehabilitated and treated many times over. Thus, the study included elements of policy and public administration and sustainability for local governments supervising the area, whilst still relatively remaining within the scope of Urban Political Ecology.

In any data set of research, there are variables to be evaluated, considered, and determined as the elements of the study. For this research, the independent variables were namely: (1) the current assessment of the health of *Estero de Sampaloc* and (2) the socio-political culture of the residents near the estuary. For dependent variables these are namely: (3) local government policies and ordinances concerning *Estero de Sampaloc* and (4) resident interaction with the estuary selected for the study. These are determined through the assessment of prognostic causalities or predicted chain of events. The study aimed to understand the extent of these variables’ symbiotic interaction. The stakeholder exhibits this relationship and explains why a particular action causes a particular effect. The inherent effect of one with the other demonstrated this, and it was determined through the techniques used to attain data.

The research, although limited to a relatively modest area and locale, involved a set of complex data gathering techniques. Experts in this field of study particularly conduct a variety of methods and data sources that range from geographical assessments using modern technology, historical and archival research, and ethno-centric analysis (Robbins,2012). The study required a thorough evaluation of the management and interaction of residents with *Estero de Sampaloc* and hence, conducted a comprehensive interview to tally specific interactions and the general outlook of the people toward their environment – which in this case, is relevant and astute to the *estero* determined. In order to support the analysis and create congruent rapport with constituents, informal interviews were used for additional information that research deemed it necessary. Once polled and reviewed, the data were appositely analyzed and interpreted. The respondents were therefore residents of at least 10 years or more along the estuary. This was to assure that enough input was expressed during interviews. The second condition was that they have been residents who live at least 3 meters from the estuary, the indicated area where direct rehabilitation from the national government was received. Lastly, they must have been at least 18 years of age to understand the political discourses of the setting, making them capable of bringing up inputs on politics and other matters of the past. And this was to also consider that the consent

forms signed would be applicable and legal. The age was set in order for the data to be accurate and secure. Thus, this study reflected on the *archaeological method* of its historical data—particularly embedded in Michele Foucault’s analytical tool for uncovering an alternative historical experience of a subject (Robbins, 2012). This subsumed that the research should acquire diachronic data concerning the establishment of the community settlements and the culture of its population. Historical data on the origins of *Estero de Sampaloc* to its present condition was also presented. This was necessary in order to elucidate and attempt to explain the behavior of people within the estuary overtime—allowing an avenue to exhibit a connection between the effects of politically driven behavior of residents and the present condition of the man-made channel. *Interviews* were conducted along with a *focus group discussion* with selected participants that would adhere to the archeological and genealogical approaches of the design. Oral history derived from these discussions paired with rigorous documents and records allowed for a substantial ethnography of the locale. In addition to this, the research was equipped with geographical data that tracked its progression, evolution, development, and flooding pathways. This aided the research in determining the quality of the estuary that are affected and may affect the population of the community surrounding it.

Data analysis was conducted according to the *type* of the data gathered; aided and marshaled by the design of the research methodology. *Phenomenological data analysis* was utilized for the datasets garnered from its description in the research design. This called for challenging the normative information collated from notes, transcriptions, recordings, and other types of documents related to the phenomenon (Rivers 1990). The researchers thoroughly reviewed the data gathered from this type of methodical research, organized the information, and classified or identified thematic sets of material. The heart of the study is the human experience and interaction relevant to their environment, participants’ given description targeting all aspects of a phenomenon was identified and tallied. These ranged from value systems, beliefs, social interactions, physical and constructive surroundings, and other aspects in order to identify themes that may vary from different accounts and participants (Rivers, 1990). In the matter of behavior, the research examined this through a genealogical analysis; reflecting on the ethnographic history of the community’s residents. Any numerically equivalent data was *only* qualitatively analyzed and treated. Historical and genealogical data acquired from said techniques was evaluated as raw data; however, its inclusion in analysis will be necessary in order to perceive affinities between socio-politically driven behavior and the environment. Geographic analysis simply provided a definitive image of the growth and expansion of the waterways; which was used to analyze its health, stability, and progress. The data was treated through a *thematic discussion* of archaeological data collated. This was expressed more efficiently through a table which was manually created by the researchers to ensure totality of analysis -- which was then done through Foucauldian archaeology.

### *Locale of the Study*

The local respondents – who were involved in the focus discussion group and the interviews of the study are the selected residents of *barangays* 432, 439, and 455 in Manila whose domicile is situated near *Estero de Sampaloc*. Additionally, local executive chiefs and officers were duly surveyed and interviewed as well for policies, ordinances, and historical data on the estuary. These officials who were elected are namely: (1) *Hon. Eulalia Santiago* – the chairwoman of *barangay* 455; (2) *Hon. German Garcia* – the chairman of *barangay* 429; (3) *Hon. Ramil Barrientos* – the chairman of *barangay* 432 and; (4) *Hon. Mark Anthony Santos* – the chairman of *barangay* 434. A part of the variable in the study included the health of the waterway, to which its diagnosis was found in the respective *barangay* offices or in the archives of Metropolitan Manila Development Authority (MMDA). While the locale of the research is the area within the selected *barangays* and the vicinity near the chosen *estero*. Since the research was isolated and limited to an area's phenomenon, the locale did not cross beyond the bounds of affected communities that are directly situated along it.

## RESULTS AND DISCUSSION

The terms hereunder were the major themes patterned after the theoretical framework of the research with their subsequent definitions utilized in the study. The political conditions pertained to the relationship of the various actors in the setting - often concerning resource allocation. The study recognized that there are power relations among and within interactions between human actors. However, further than this, there are power relations present in human and non-human actors as well. Cultural frames, on the other hand, are the integrated practices and customs that are adapted by the community's population analogous to the environment introduced to them. These may range from developed principles to habitual acts. Ecological conditions refers to the physical state of the environment in a particular setting, which in this case is the tributary. Urbanization also fall under this category as hybrids in the study, particularly the physical transformations done in infrastructure. Economic conditions, then concerns the financial setting of the area in total. These include the financial status of the residents, the job opportunities made available by the estuary, and the allocated budgets of national and local governments to the *estero*.

The analysis where Foucauldian archaeology has focused its interpretation on "knowledge, materiality, and power" (Hook, 2007) of communities who have—at length—shared experience of a phenomenon in a particular setting in the annals of historical progression. The discourses are how the method volleys its points across the discussion. The interviews and focus-group discussions are collated and presented hereto; the data made available to the research appraises a phenomenon that contributed to the hastening of metabolic processes in the urban area. As postulated in Escobar's (1999) description of the study's theory he determines that "*political ecology is a study of the manifold articulations of history and biology and the cultural meditations through which such articulations are necessarily established.*" Being that Foucauldian archaeology is the methodology of interpreting the ample data received in this research, its nature of discussion and exposition compliments the necessity of political ecology theories—of which reorganizes the analysis of man's interaction with his environment as history progresses. Readings on Urban Political Ecology (UPE) mentions that there is a need for analyzing the "*co-production*" of the social and the natural (Angelo & Wachsmuth, 2014). This simply entails that theories of UPE must not interpret society as one that builds around the environment simply because of the need to urbanize and develop, but rather that urbanization and development is the collective result of nature and society interacting with each other. These results of interactions (often referred to in the field as *hybrids*) may pertain to policies mandated by the government—both local and national, or the fiscal allotments of both private and public entities towards maintaining the environment, or to an extent the cultural practices of people in communities that have been adapted to accommodate certain pre-conditions. The study examined the contribution of cultural frames with the political, economic, and ecological conditions that shape the discourses of actors in the chosen environment which is *Estero de*

*Sampaloc*. The interview, especially the focus group discussion, provided this research's historical data which framed the general discourse around the estuary.

*On the Dynamics of Power Relations in Estero de Sampaloc*

*How does the interaction among the stakeholders of the community near the estuary namely; (1) the residents, (2) the local government, and (3) the environment itself – affect the condition of the estero?*

Foucauldian *discourses* are defined as the formation of knowledge through the examination of socio-cultural norms and practices in society. This collective knowledge formed through these determinants creates hierarchy in a society or community that will exhibit power relations among actors within that social sphere (Weedon, 1987). All social practices entail meaning and meaning shapes and influences what we do - all the practices that we have [must] possess a discursive aspect to them (Hall, 1992). In the study of Urban Political Ecology (UPE), discourses are important factors that demonstrated how the movement of interactions contributes to the urbanization of an area. The study endeavored to achieve and develop a comprehensive assessment of the linkages observed in the community's culture that establishes power relations which may either limit or enhance interaction between different stakeholders. Power relations are important in the discussion of discourses because it elucidates the way these discourses are created, shaped, and essentially transformed as society progresses. This may be in terms of interactions of the residents to the *estero* being limited because of a policy, or in terms of the estuary's provision of service being limited because of the way residents interact with it – either creating conditions that would prevent such actions or allow it. The data mentioned adapted practices from outsider barangays who have been discarding refuse unto the *estero*. Such practices have had to develop over time.

As the city urbanized and more households were established, the dense population maintained that waste segregation would be a much larger challenge for the local governments. As the numbers grew to unmanageable quantities, respondents have agreed that there was direct proportionality with the garbage found in the city. Thus, habits were formed where people would simply discard their wastes to the nearest receptacle – the estuary. The collective knowledge of how to easily discard wastes became a norm for some time in the area near and around the waterway. However, as the condition worsened and the water quality of the *estero* dropped to exponential degrees, the community within the vicinity began to shift their principles towards a safer and more livable space. The interaction of residents outside the vicinity of the estuary and the ones within, demonstrated the power relations of contesting discourses interacting with the environment or the biological processes – especially exhibited in the prevalence of policies that cater to rehabilitation which limited the detrimental actions of other residents to the water-system. Policies in this situation has become the result of the interaction between nature and society or cultures known in Urban Political Ecology

as *hybrids*. As Anna Zimmer (2010) describes how the dynamics of the theory work, she mentions that there are discontinuities, conflicts, and fluctuations around the three elements found in the triangle: social practices, discourses, and relations that influence nature. These are the benchmarks of history that allowed and demonstrated its progression, where it shapes discourses and societal norms. The discontinuities as she has stated, may not be in relation to sudden shifts in perspectives, but a gradual process of several interactions changing power relations across actors simultaneously.

Much like Foucault's notion of power and progression, it accounts for archaeological analysis of phenomena. Preconceived cultural behaviors of the residents near the *estero* that affect it are observable through how the *barangay* chairpersons educate and regulate his/her constituents on proper waste disposal; how the elders of the *barangays* scold and educate the children on the importance of a clean *estero* and the dangers it holds; and how people who have experienced flood due to the formerly clogged *estero* became proponents for the *estero's* cleanliness. The relationship between the local government and the citizens affect the condition of the estuary through the citizens' willingness to carry out the policies or simple requests that the *barangay* assigned to them. However, in cases such as *barangay* 434, where citizens are often neglected because of proximity, they are often forced to rely on themselves to keep their environment clean, as they believe they would be the first to feel the consequences if not. Social inter-*barangay* power relationships and the discourses vis-a-vis affect each other. *Power relationship and the caste system for modernity* of the *estero* are determined through the geographical differences between the *barangay*. This also entailed more financial allotments.

The economic status of the *barangays* affected the condition of the estuary; their condition is observable by gaining knowledge on how much they spend for the *estero* and how often they were under the surveillance of the PRRC and the national government. The financial capability as well as its connections with the PRRC and the national government create *practices* such as the monthly/weekly/daily declogging of the *estero* and the daily sweeping of the *barangays'* streets. Human behavior towards their environment affect social and industrial metabolism through *politics and social relations*; which comes into play whenever the *barangay* chairpersons met with one another to discuss and resolve the problems regarding the *estero* and also whenever *barangays* and the PRRC create positive relationships through a collaborative teamwork of de-clogging, dredging, and cleaning of the *estero*. The *biological, chemical, and physical processes* of the *estero* such as its dredging, the relocation of the informal settler families, the arbitrary scheduling of the garbage collecting vehicles, and the unavailability of the sewerage or the *poso negro*, are product of the *caste system of modernity*. In turn, all the discourses, the practices, and the biological, chemical, and physical processes of the *estero* have produced a hybrid. A hybrid shows how different temporally, spatially, and culturally specific practices and discourses as well as the power relations and societal relationships with nature in which they are embedded are negotiated on a daily basis in micro-politics (Zimmer, 2010).

*On Co-Production and the Political Economy of Estero de Sampaloc*

Power often ascribes to the allocation of resources and materialities, where distribution and the effects of government policies and programs play a large role. Political ecology studies describe how power in the material form moderates human interaction with society and nature—through either repressing power relations or normalizing these interactions. As Michel Foucault postulated, first rate powers come from normative ones where there is no need to repress or impose such authorities. He stated that people would, in this frame of power, automatically act as how society would want people to act. *Co-production* follows this logic because it is a process where man must interact with other elements outside of nature, to develop. In this context, man would eventually develop different discourses that would correct itself—a process of how political ecologists would eventually lead to urbanization and development; first in society, then to the city. As what Watts (2003) argues that, “*political ecology rests on the dialectical and non-linear relations between nature and society*”.

The research fulfilled two goals of UPE where: (1) it aims to bring its methodology to the urban setting and; (2) re-theorize it as a socio-natural and political process, foregoing the paradigm of purely social transformation. Co-production brings to the table the complimentary character of man collaborating with institutions and society to develop nature. According to the study, one may observe that the interaction of man—whether negative or positive—with nature, may severely change physical processes in the empirical world. A situation that respondents gave was that after the estuary was rehabilitated, and all informal settler families (ISF) had been relocated, there have been persistent reports of children and adults from farther barangays who would throw their garbage during night so as not to get caught. Because of this interaction with the waterway, and the persistent effects of clogged and polluted waters on residents who live nearby, the government has ordered six-foot metal fences to be put up in order to prevent throwing trash; in addition to the safety it presents to its constituents. This exhibited the impact of co-production, where a physical change in the infrastructure and the budget allotment for the environment was the result, but at the same time was given to the citizens to sustain and support. Another example would be the interaction of nature in times of severe flooding or over-flow to constituents living near the estuary imposed a refurbishing of foundations to avoid erosion and the government’s project of dredging where water levels could now stay low despite the monsoons. These projects require large budgets, and some may in turn create job opportunities for residents in the area—to which the respondent barangay chairpersons have all affirmed this information. The economy must be there to turn the gears of co-production. Since it is a concept that requires much of the citizen as a body that enables and executes the services needed and produced by the government. The government forms a certain transaction with its citizens where projects, policies, and laws are given by the government to the people and where the people are also responsible for maintaining it.

A comprehensive reading on Elinor Ostrom's *co-production* was vital to understanding the interactions presented in the first section of this research. Services that are public in nature are cooperative. These services, through programs, projects, and mandates, are produced through the notion of *paid* and *unpaid labor* that interacted with one another to produce that service needed. This meant that paid labor through public or private institutions that cater to issues are compounded by unpaid labor which entails the actions of private individuals such as traditions, norms, persistent knowledge, and ideas that shape these actions. The presented data demonstrates this by showcasing the embedded knowledge of the respondents and their sense of responsibility towards the estuary's cleanliness and sustainability. The stakeholders are situated in the area and are faced with challenges that require them to adapt to the environment. When the constituents were exposed to the programs and projects mandated by both the national and local governments, they were able to adapt actions and practices that would help to fully deliver the rehabilitation of the estuary. Although true, it still entails a long process before creating a system of activities that demonstrate the theory of co-production - one that needs socio-political awareness of the citizens. However, the community around the chosen estuary has been stapled in its landscape for generations and has already presented awareness to the situation.

Political conditions are translated through policies and the contribution of the national government is reflected by the general attitude of the residents: recognition of necessity. The local government's contributions on the other hand, are reflected by the constituents' empathy towards the *estero*. Findings have also suggested that the exposure of the phenomenon to media providers have caused an impact towards how the residents of the area perceive the importance of the estuary not only in daily social life, but the larger picture of environmental awareness and concern. On the economic outlook, the amount of money budgeted on the declogging of the *estero* is not the most significant factor on the *estero's* rehabilitation. Rather, it is the political will of the *barangay* chairpersons and the cultural frames of the people residing near the estuary. Upon further examination of the data, it has also suggested that the constituents' economic condition is not immediately affected by the *estero*, except for situations that have the local government directly hire laborers for maintenance projects. The cultural frames determine the sentimental and practical relationship of the people living within and around the estuary. Citizens living near the estuary have established latent cultural activities that have bonded the community to each other, and the relationship of the communities to the estuary. They have also experienced the effects of the conditions of the estuary first-hand and are therefore more concerned for the estuary's health over that of the people who live further as exemplified in the several accounts of the respondents against the apathetic passers-by that throw trash and/or wastes in the *estero*. The residents have also acknowledged the correlation that the more people have taken up residency in the area, the worse the conditions of the *estero* became. This fully exhibits the awareness of the residents towards the causal relationship of the *estero's* conditions and their quality of life.

## CONCLUSION & RECOMMENDATIONS

The analysis of the data required multiple facets derivative from Nietzsche to Foucault and was determined to be presented through a thematic analysis. The findings of the study surmised the inferred answers to the problem presented in the initial research and determined whether these agreed with the inferences made by the researchers. The research therefore concludes that the metabolic rate of urbanization grows as the stakeholders of *Estero de Sampaloc* continuously interact within the frames of: (1) political conditions, (2) economic conditions, (3) cultural frames; and (4) environmental conditions. As long as interactions between stakeholders are within the four frames, subsequent reaction will result to hybrids formed and created from human and non-human interactions. Practices, habits, and social discourses allow for these interactions to happen among the actors, which affects the estuary in terms of development. However, the evolution of the *estero* may vary, as negative interactions that perpetuate the adverse effects of essentially bad practices, habits, and disadvantageous discourses may prove to be detrimental to the urbanization process of the city. It has also been concluded that the co-production of both local and national governments with the residents has only initiated. It must also be inferred that the stakeholders of the environment have, through the course of generations, effectively integrated the recognition of the necessity of sustaining the condition of the estuary to their interactions. The previous hypothesis which posits that the residents' failure to comply, due to their cultural habits and practices, to the public policies implemented by the Local Government Units (LGUs) in order to sustain the development of *Estero de Sampaloc* in that it directly contributes to the recurring degeneration of the estuary's condition is therefore concluded to be *false*. It is in the development of proper discursive formations that could theoretically institutionalize citizen action and response that would ultimately sustain environmental policies.

The recommendation of the study would apply to the significant stakeholders as per mentioned in the research. There are three divisions of recommendation being: (1) to the locale of the study, (2) to the future researchers who wish to partake in the field; and (3) to the external forces that may influence development in the area - the media. This study recommends that the constituents of the *barangays* included must be more aware of how the *barangay* or the local government spends its funds. This is to promote a certain degree of transparency that could aid in the mechanisms of co-production. This would also make the constituents become knowledgeable of the services that the *barangay* can provide them and in turn attempt to create a system of actions that could significantly support the sustainability of policies and projects. The study has also disclosed that rapport between national and local government institutions and specialized organizations are incongruent and to some degree manifest uncooperative operations. This research intended to be a landmark study that will guide future students or researchers interested in the topic. The researchers would highly recommend that prospective studies that will attempt to recreate and/or utilize the

same methodology used in this research should attempt to further explore and include different urban environments - not limited to water systems. Multiple studies of the country's estuaries may also lead to an in-depth understanding of the *Ilog Pasig* (Pasig River) itself, where its health is important in the ecology of *Manila*, the capital city. Future studies should also utilize a more rigorous thematic analysis in data presentation, completion of the utilization of organizing software for qualitative data analysis, to allow for a clearer presentation. Lastly, the study would not have been as effective in communicating the drastic rehabilitation of areas that have deplorable environmental conditions without the exposure of the phenomenon to the mainstream media. The recommendation of the researchers thus concerns the utilization of media sources to exhibit the awareness of residents and to present to people that large-scale rehabilitation is possible and perhaps even more essential - it *can* be sustainable.

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