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Editor's Notes

This volume's first issue features three full-length articles and a policy note, addressing diverse topics, such as urban planning, communication network, personnel management, and transportation. While the featured scholars diverge in their approaches and methodologies, they all provide empirical evidence that may inform practices and policies, decisionmakers and administrators, and even those beyond the scope of their studies, e.g., administration and development of medium-sized cities situated in a geospatial periphery, information exchange in medium-sized cities during disasters, and job retention among women in male-dominated professions.

Jose Edgardo Gomez, Jr.'s article, "From Ancient Entrepôt to 21st Century Hub: A Critique of Butuan City's Administrative Potentials at the Geospatial Margin" examines recent planning and governance practices of a city-in-geospatial-margin with Butuan City as a case. Combining multiple qualitative methods of field research, observation, interviews, and document analysis, his article well demonstrates how one city's growth and administration can be constrained by geography. The author then recommends strategic ways for the City to overcome inherent geophysical conditions to foster further administrative and structural development, and the prospective urban corridor development in the region.

Michelle Castillo's "Empowerment, Satisfaction, Commitment, and Retention Intention Among Women in the Military: The Case of the Philippine Navy" is a relational research on the determinants of willingness of women to stay in the Philippine Navy, a male-dominated organization. Organizational commitment is found to be a significant factor in this small population, which is in turn influenced by job satisfaction. Programs improving welfare of women also affect satisfaction and commitment of women to serve the Navy. Partly an indirect evaluation of the Navy's gender and development program, the findings put a premium on welfare promotion and mechanisms for more meaningful participation.

"Social Network Analysis on the Information Exchange of Sorsogon City's CDRRMC during Typhoon Nina" by Nissi Abigail Buenaobra et al. explores and exhibits communication and relationship patterns at work in Sorsogon City's disaster management council in its response to one devastating disaster. Their article establishes the information grid by enumerating primary suppliers and consumers, illustrates its generally effective management, and locates lapses in a network of actors and institutions collectively providing a set of essential services during Typhoon Nina. The article ends with a practical recommendation to further revisit the council, and map out the entire ecosystem of emergency responders and their information needs.

Each of these articles benefited from the 2018 PJPA Writeshops, which included lectures and exercises on academic writing and journal publishing, small group discussions, and review by public administration scholars. Out of 12 shortlisted papers, these three articles cleared the two-member panel of reviewers (involving several revisions), before undergoing a separate double-blind peer review process of the journal. The Writeshop received financial aid from the Commission on Higher Education through its Journal Incubation Grant. The NCPAG Publications Office provided the technical and operational support.

The policy note of the late Romeo Ocampo, chairman of the PJPA editorial board, sheds light on the transportation infrastructure policy of the Philippine government, unpacking its theoretical and policy underpinnings (incorporating history and roadmap), and juxtaposing it against the overall mandate to serve the public. The primacy of data, foresight, and circumspection is prudently accentuated in his analysis of its policy design and implementation. This issue is dedicated to him. This posthumous publication is testament to his scholarly passion and productivity.

On a final note, we would like to welcome eight new members of the international advisory board (who also constitute the pool of special issue editors and reviewers): Professors Mampei Hayashi, Akio Kamiko, Masao Kikuchi, Helen Liu, Fumio Nagai, Eko Prasojo, Trevor Seymour-Jones, and Achakorn Wongpreedee, who joined the PJPA family in late 2018 and early 2019. We are equally grateful to the other seven advisory board members who renewed their interest and support: Professors Belinda Aquino, Joaquin Gonzales III, Pan Suk Kim, Raul Lejano, Akira Nakamura, Rosemary O'Leary, and Jon S.T. Quah. We also welcome our guest editor for the next issue: Prof. Kristoffer Berse. Finally, we thank our steadfast readers, contributors, and reviewers to whom we are deeply indebted.

Michael A. Tumanut
Editor

From Ancient Entrepôt to 21st Century Hub: A Critique of Butuan City's Administrative Potentials at the Geospatial Margin

José Edgardo A. Gomez, Jr.
School of Urban and Regional Planning
University of the Philippines Diliman

The City of Butuan in Agusan del Norte province occupies an important niche as a regional commercial and institutional center in the northeast quadrant of Mindanao island. Rooted in an identity dating back to precolonial times, it is building itself up as an emerging major hub of transportation and agricultural productivity in contrast to its less environment-friendly past as a logging and mining center. This research takes a critical stance by describing and reviewing the key advantages and disadvantages of Butuan City and its environs from a geospatial, administrative, and planning perspective. It shows that despite the recent emergence of political-institutional advantages, Butuan will always be constrained by certain locational features. Describing its present and potential land and sea usage, this study suggests other ways that Butuan City, in so far as it is a nexus of the province and of the Caraga Region, might yet continue to grow and profit from its peculiar placement in the far northeast of Mindanao.

***Keywords*:** *Butuan City, cluster, infrastructure, periphery, reformist officials, satellite governance*

By most visible manifestations, Butuan City, a Highly-Urbanized City[1] (HUC) and administrative center of the Caraga Region (Region XIII) of Mindanao island, in the Philippines, is a thriving urban center, although not as prominent or wealthy as the nearby cities of Cagayan de Oro and Davao. Historically home to traditional enterprises and pioneering families who made their fortunes from the timber and mining industries in the decades following World War II, Butuan's economy has diversified to include a wider, more democratized base, and gives the appearance of being poised to grow into an international hub with connections to the rest of Southeast Asia. It also remains a fairly robust producer of various agricultural products, including rice, and some fisheries. However, it does have some geographic and spatial constraints that must be taken into consideration, especially if it is to be governed effectively as a territory with cross-regional and international connections.

This research tempers the enthusiasm of touristic and popular discourse, and attempts to present a more balanced view of the potentials of Butuan City, with the end in view of planning for more comprehensive spatial governance that will form the foundation of later development, and that will turn apparent constraints into potential or actual specialized growth. In particular, the research asks: in which ways does marginality, in a geospatial (i.e., territorial) sense, shape or potentially constrain the administrative and structural development of a city like Butuan?

The study takes Butuan's geophysical givens as the frame that potentially shapes or limits the growth or even the presence of institutional and other development structures that may or may not have been planned. The focus is to describe this frame and how it may actually thwart some growth aspirations, rather than allow it to be taken for granted or to lie below the level of decisionmakers' consciousness. The research topic itself is confined to understanding the limits of a single regionally-important site, but one which may be taken as a model for other similarly-configured areas.

Problem Context, Scope and Limitations, and Significance of the Study

This research is derived from planning studies of the author in Butuan City from October 2017 to January 2019, which focused on qualitative assessments of governance and planning, as well as geospatial patterns; that is, it makes a critical review of factors like geographic location, politico-administrative presence and priorities, and actual conditions of everyday life on the ground in order to correctly identify challenges and concerns related to public administration and planning.

This study takes the geography of Butuan to be the major locational problem and administrative challenge of the city as a sociopolitical aggregate aspiring to become a hub for international travel, which is able to support year-round substantial influxes of participants in meetings, incentives, conventions, and exhibitions (MICE), among other urban functions. The context of the problem can be said to consist of (1) the peripheral nature of Butuan itself in Mindanao and in the Philippines, (2) the presence of competitive neighboring cities like Cagayan de Oro and Davao that can boast of more central locations, and (3) the lack of any permanent or outstanding politico-administrative advantage or other accomplishment that might otherwise have provided a compensating aspect to Butuan beyond its present role as a regional center. It is this context that constitutes an issue worthy of scholarly investigation, because it takes a fixed factor (geographic location) and problematizes it by investigating how variable balancing factors (e.g., political priorities, wealth, strong culture) can be leveraged, using an administrative approach, to overcome spatial marginality.

While there is nothing wrong per se with the current growth plans of Butuan City and its role in the framework plans of Caraga, there are immutable features, such as peripheral location, the presence of a major river that bisects the city, and other major settlements nearby that cannot be glossed over or downplayed. These issues will require, at an earlier rather than a later stage, creative and practical approaches by leaders and administrators, to raise the city as a politico-administrative entity to the eminent position that it aspires to, whether in empirical or perceptual terms. Presently, it would seem that government structure does not relate to, or recognize, this regional positionality as a major constraint, hence the need for this research.

As for the academic or practical significance of this research, the author locates this study in the literature that addresses the nature and means of overcoming or working with marginality or peripherality, whether from a spatial or administrative perspective. A scan of the literature shows that areas considered peripheral, whether physically distant in absolute terms or not, tend to have some common characteristics. These characteristics include geographic remoteness, weak economies, out-migration, high state intervention, lack of control over decision-making processes, high aesthetic values, etc., which are both the cause and result of a remote character (Pezzi & Urso, 2016, p. 7) and which do not all apply to Butuan as research site, except in a relative sense; that is, its economy is not weak, but not as strong as those of other large cities, and it commands its own affairs, yet is still dependent on Manila-centric agency decisions for additional inputs of promotion and support. In such cases, institutional setups for development may involve a whole host of solutions: creative one- and two-tier municipal government restructuring, inter-municipal agreements, special-purpose districts, direct service provision of some aspects by central government, and reliance on grants or private-sector provision, as is done in Russia, for example (Kitchen & Slack, 2001, pp. 2, 17). At the same time, one might say that Butuan is open to alternative modes of agricultural investment as a solution to marginality, where and when demographic and environmental constraints have begun to outweigh economic and political power (Messerli et al., 2015, p. 64).

From a Philippine perspective, this research contributes also to the relatively small corpus of scientific works discussing the administrative and geospatial patterns for Butuan as well as the Caraga Region. As a largely descriptive study, it offers geospatially-grounded findings that can be used for more in-depth analysis in future studies on Mindanao, specifically about governance issues that are relevant to clusters of settlements formed by dense urban centers and satellite areas. From a theoretical perspective, the choice of Butuan as a site for studying peripherality versus political and administrative intent derives precisely from its location and its ensconced layout—physically protected but also less accessible than nearby cities. It is precisely this constellation of geophysical constraint and booming socioeconomic and cultural potential that makes this area unique.

The research gap as regards claims of growth potential for Butuan needs to be substantiated and delimited by competent third parties or outsiders who can critique conditions on the ground. The research is also useful as a modest contribution to the discourse on how politico-administrative literature might interface with planning and geographical analysis, at least on a theoretical level. For example, theory on institution building might emphasize logical and sequential establishment of formal and predictable structures, but actual conditions on the ground in Mindanao might compel a modification of theory to show that, given spatial conditions like remoteness or geophysical conditions like terrain inaccessibility, less orthodox and more informal public administration arrangements may be best suited to maintaining growth as well as tranquility. As for the literature specifically on the effects of spatial or other types of peripherality and marginality on administration and governance, it appears that the scientific literature here is sparse, hence constitutes a research gap, which this article tries to address in a modest way.

Technical Approach and Methodology

The research has been limited to observation of field conditions and agency reports from October 2017 through January 2019, although other secondary data reviewed covers at least the past decade, along with some historical accounts. The author also employed selected key informant interviews (KIIs), such as with the mayor and his staff, in order to determine: (1) chosen development priorities of the current administration, (2) how actual governance on the ground provided augmentation that were beyond the formal structures of government, and (3) selected locations for growth and other special projects. One to two rounds of KIIs with key officials were particularly useful in scoping and defining the reach and reasons for perceptions of development potential.

Within the inner city, the researcher was able to do at least two transect walks of at least a kilometer each, following north-south and east-west axes in the center of the town (i.e., Cagayan de Oro-Butuan Highway, Jose Rosales Avenue), which would entail systematically writing down observations of physical structure and people's activities along lines of ambulation, in order to get a grounded description of typical urban life.

The author also performed windshield surveys of the major road, Montilla Boulevard, and the hinterland areas of the city, to physically experience the distances to be travelled between key centers, and to verify the presence of institutions and projects in various barangays. To the east, the author was also able to obtain a panoramic view of neighboring local government units (LGUs). This exploratory fieldwork on both sides of the Agusan River was supplemented by informal discussions with knowledgeable locals as well as outsiders who may have been familiar with the city to get a sense of what locals might perceive

to be the state of their city. Data derived from communicating with people on the ground was essentially used to validate what could already be inferred by looking at actual site conditions, satellite images (from Google Earth), and GIS-based sieve mapping. It is emphasized that, while complete in its own scope and working conclusions, this research can form part of a longer series of more comprehensive assessments of northeastern Mindanao, with Butuan being only one important facet of the overall developing landscape and seascape.

Scholarly Literature Relevant to the Study

Decentralized Governance, or Central versus Peripheral Institutional Setups

The development of an urban area like Butuan necessitates some sort of decentralized politico-administrative setup, which usually may take fiscal (how much central government cedes control over taxes and other revenues to non-central government), administrative (how much it grants autonomy relative to central control), and political (how much political representation and other exercises of power are ceded by central to non-central government) forms (Schneider, 2003). However, such decentralization almost always has a corresponding spatial component, especially over large territories, where a single center alone cannot dominate and where subcenters need to be established, in accordance with the administrative principle of Christaller's (1933/1966) central-place theory. It follows that such satellites or clusters of hub-and-spoke arrangements must be set up to allow institutional presence and function to be expressed. Moreover, based from the corpus of public administration theory—since institutionalism or related studies of institutions see them as bounded social constructs of rules, norms, and the expectations that constrain individuals and groups (Frederickson et al., 2012)—the deployment of satellites and clusters must follow fairly predictable patterns modelled after the central authority, unless conditions at the periphery require modifications or supplementary governance structures, possibly even informal ones.

In looking at Butuan City and its prospects for growth, this study has taken a critical view of those physical conditions present in both the center and periphery. These conditions are necessary to determine whether these locations require a mere facsimile of standardized structures or more innovative bureaucratic and informal setups as inputs or adaptations to present and forecasted, desired growth—especially given the ambitions of city officials to magnify Butuan's current role as a regional hub, and possibly to turn it into an international gateway.

Coastal Geography, River Deltas, and Historic Politico-Administrative Centers in Southeast Asia

As emphasized by local bureaucrats and laypersons alike during the fieldwork, the politico-administrative tradition of Butuan can be proudly traced to precolonial (i.e., pre-Hispanic) times. During this period, like other coastal polities in Southeast Asia, the cluster of settlements that would become present-day Butuan emerged from the geography of the Agusan River. Somehow, this Southeast Asian heritage is a mainstay of identity and fuels contemporary ambitions to rise to prominence in the international region, in keeping with Butuan's ancient role as a deltaic nexus where trade and agriculture flourished since time immemorial.

As Seto (2011) points out, the mixing of fresh and saltwater in these sediment-rich land-ocean zones made them biologically productive systems able to support multiple crops. This made Butuan a natural site for agricultural activity and residence of numbers of people who collectively migrated into and around the vicinity, despite any typical hazards like floods, hurricanes, tsunamis, storm surges, coastal erosion, landslides and seasonal inundation (Seto, 2011). A hierarchy or ranking of settlements in such discrete river basin systems would have developed and would then have been manifested in terms of their geographical position. All the societies in the system would have been dependent on each other, and on the central place downstream for the system to work (Manguin, 2002).

Upon this fertile platform, the important geographic and sociocultural peculiarity that occurred in places like the Philippines was the development of galactic polities consistent with the design of traditional Southeast Asian kingdoms—design that coded their cosmological, topographical, and politico-economic features in a composite way (Tambiah, 2013). The layout is varied with ecological conditions of the surroundings and sociopolitical constraints, but on the whole, such polities were typified by a politico-administrative center, usually coastal, with lesser tributary settlements or trade partners. The emergence of settlements that conformed to such geography had, after the Iron Age, come to be manifested in a tradition of small urban states with hydraulic works encircling large communities, thick earthen ramparts, and connections to nearby waterways—with some of the most well-known representatives being Melaka and Makassar (Stark, 2015). Even as individual cities in these coastal regions rose and fell under successive raids and attacks, the notion of "city" remained and inhabitants quickly rebuilt on ground where the razed cities once stood.

The historic research of Tagliacozzo (2007) on Southeast Asia is particularly rich in explanatory detail, and mentions several points that resonate with Butuan's current placement. For example, it was very common in ancient

(and even present) Southeast Asia to have a decentralized governing system where a central authority held sway over remote hinterlands, sometimes on different islands (Tagliacozzo, 2007, p. 918), in the same way for instance that Manila relates to Butuan as Butuan does to its neighboring municipalities and hinterland villages. In that aforementioned governing center, the economic and administrative hearts of the system were fused where the capital also tended to be the market center, as opposed to polities in mainland Asia, where mercantile ports were separated from a protected political capital (Tagliacozzo, 2007, p. 915). The Southeast Asian city always retained a certain flexibility in socioeconomic and political structure owing to the need to adjust to the vicissitudes of trade with distant partners elsewhere (Tagliacozzo, 2007, p. 915). Taking off particularly from the latter point, Tagliacozzo concludes that contemporary Southeast Asia will probably retain the flexible, concentric model of exchange between centers, which signifies that for secondary urban areas like Butuan, there is always room for cycles of growth and decline.

Given the foregoing geospatial premises, one can then appreciate the trajectory of Butuan's development, akin to various polities that were both separated and connected by the coastal connectivity of the South China Sea, as maintained over long distances and through deep cultural history (Hung et al., 2013). Subsequent transition to postcolonial national administration, as manifested in prosperous urban areas, is indeed remarkable. As early as the 1950s, scholars began to notice that the less populated Southeast Asia was coming into its own as a distinct urbanizing macroregion. While it is true that nationalists have occasionally called for replacement of former bastions of imperial rule by new politico-administrative centers, these so-called primate cities remain unchallenged as the urban keystones of most nations in that part of the world (Reed, 1972). Southeast Asia is no longer at the periphery of development, although given the rough geographic division between mainland and island Southeast Asia, progress has been uneven in the last half of the 20th century to the present (Hirschman & Bonaparte, 2012). Indeed, new cities are springing up at a rapid rate, not only in the two emergent world powers in the region, China and India, but also in other Asian countries where previous precolonial and colonial forms, like the fortress model, have since evolved into modern gated communities (Hogan et al., 2013).

Within such cities, the role of public administration and governance is quite important, as there is an increasing demand for accountability of officials, based on the "rules of the game" as defined by state institutions. Southeast Asian governments, for instance, have been forced to practice greater efficiency in the use of public resources, also following incentives that shape the action of public officials (Gonzales & Mendoza, 2004). There seems to have emerged a major shift towards market-led principles and business-like structures and standards, which show that Southeast Asia has been following some Western models, albeit adjusted to the local context (Haque, 2007). The latter shows how frameworks

that may have originated elsewhere, especially the capitalist West, have not been adopted blindly, but are mediated and filtered through local culture and politico-administrative dynamics.

Local Governance Considerations in the Philippines

In the Philippines, especially since the advent of the 1991 Local Government Code, there has been more responsibility devolved to local governments, since the law provided for wide-ranging powers for local chief executives to spearhead development. In settled coastal areas in particular, increased state decentralization and people's participation can be a boon, especially in the context of a complex governance system over the sea (Fernandez, 2010). A vital question to ask then in such cases is whether the local elected officials are sufficiently forward-thinking, knowledgeable, and cooperative, so that they can utilize their powers to effect a localized and socially-equitable growth. One of these powers is the capacity to do local planning, which is now also a duty of LGUs, and requires that socioeconomic development facets also be considered together with rational spatial growth and physical improvements.

Mindanao, and the Caraga Region: Other Aspects

Given the foregoing broad patterns of development in Southeast Asia and the emerging emphasis on good local governance, it is relevant to turn now to the southern main island of the Philippines, as the locus of this study. Mindanao is made of six regions subdivided into 26 provinces. It is abundant with natural resources, with productivity dominated by rubber, palm oil, and plentiful mines centered in the Surigao area, with the rest of the Caraga Region to the northeast exporting other agriculture, fisheries, and forestry products (Ministry of Economy, Trade, and Industry, 2017). In-migration to rural areas of Mindanao was extremely heavy from about 1945 to 1970, since the area then represented the country's last agricultural frontier, attracting nearly two million people who had moved to Mindanao during this period (Costello, 1998).

Urban development has proceeded apace, such that Mindanao is also beginning to experience the problems of cities, with flooding in lowland areas of Butuan, Cotabato, Davao, and Jolo, as attributed to past indiscriminate logging practices and other unsustainable economic activities in the uplands (Mindanao Development Authority, 2011). In the Agusan area, there is a conflation of urbanization and rural areas that still sustain wildlife and mineral wealth. For example, the Taguibo River watershed provides clean water supply to residents (Herbst, 2011).

Butuan, Agusan Province, and Butuanon Culture

Finally, zeroing-in on Butuan, it should be recognized that culturally, the area has a long heritage dating to precolonial times. The natives have been

known as "Butuanons" or "Lapaknons" (swamp dwellers), in relation to the deltaic marshlands of their homeland. They have historically been regarded as one of the indigenous groups in Mindanao with their own language that has an increasing number of speakers (Kobari, 2001). Butuan commands a strategic position at the mouth of the Agusan River and serves as a countermagnet to the somewhat more industrialized and commercialized Cagayan de Oro several hundred kilometers west, although both are representative of the dominance of cities in Northern Mindanao (Satur, 2012). It is also a central destination in the Agusan River Basin, which includes Agusan Valley and Compostela Valley (Varela, Fernandez, & Degamo, 2013).

Like other cities, its prosperity has had some social costs, as when 175 informal settlers were displaced by the Butuan City Drainage Improvement Project, highlighting the need for just solutions in resettlement processes (Navarro & Almaden, 2014). Still, there are improvements in other areas, as for example, better tax mapping in Butuan has now reduced the need to revise map sections (i.e., clusters of land parcels marked for certain types of revenue) from three days to a matter of minutes (Demetillo, Japitana, & Bonotan , 2018). Moreover, the city continues to play a major role as a center of commercial and industrial activity in the Caraga Region. Taking data from the past (and present draft) land use plans of the city, the reader should perhaps also be made aware of the basic territorial-administrative subdivisions of Butuan as detailed in the succeeding paragraphs.

The total land area of Butuan City (see Figure 1) is approximately 81,728 hectares (Butuan City Government, 2002). It covers 86 barangays, which can be further subclassified into 27 urban barangays and 59 rural barangays. Previously known as the "Timber City of the South," Butuan used to have 40 barangays with forestlands within their respective territorial jurisdictions. These forested barangays encompassed an area of approximately 46,215 hectares, or an equivalent of 56.55% of the total land area of the city, while the remaining 35,513 hectares, equivalent to 43.45%, were classified as alienable and disposable (Butuan City Government, 2002). Over time, however, forest cover has tended to diminish, hence the need to safeguard and replenish forest resources over the long-term.

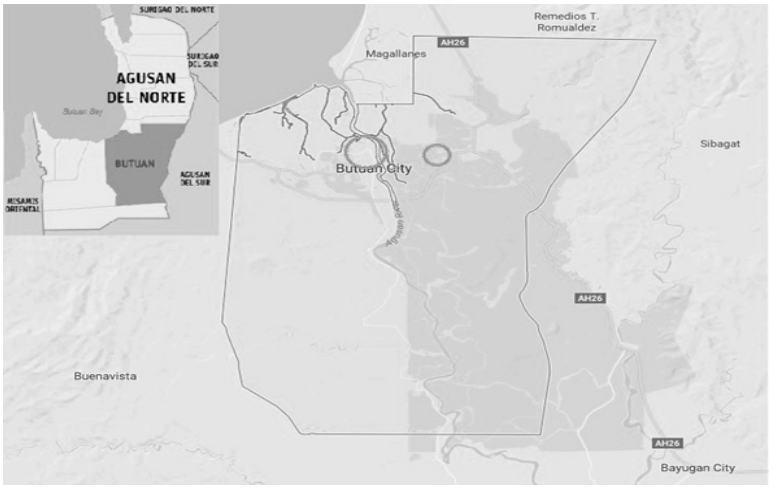
Table 1. Current Status of Land Classification

Classification	Area Coverage (has)	Percentage
Alienable and Disposable	35,513	43.45%
Forestlands	46,215	56.55%
Total	81,728	100.00%

Source: Butuan City Government, 2002

The remaining massive natural resource potential of the city, and of the province of Agusan del Norte as a whole, represents untapped growth potential, but also a greater responsibility to safeguard the environment. As sustainable development is now the minimum standard for most anthropogenic growth, it should also be applied in the case of the study site.

Figure 1. Location Map of Butuan City



Note: The circles indicate the two main urban growth centers that are clearly experiencing growth on the ground.

Source: Wikipedia, n.d.

Fieldwork Observations and Patterns

The fieldwork was guided by the motivation to verify the actual state of socioeconomic growth in Butuan City in order to form an independent estimation of its development trajectory, especially as limited by physical and spatial characteristics as a city-on-the-margin. Consequently, the fieldwork results may be grouped into the following discussion areas:

Geographic and Topographic Challenges

Despite its modest prosperity and continuing role as a regional crossroad, there is no escaping the fact that Butuan is somewhat geographically peripheral in relation to the rest of Mindanao and the Philippines (see Figure 2). Moreover, as the author sought new information beyond Butuan's borders, it came to light that its terrain is oriented towards the interior of the archipelago, and is barred from open access to the Pacific Ocean by the landmass and low mountains (<3,000

meters above sea level) shared between Surigao del Sur and Agusan del Norte, which traverse some 85 to 90 kilometers all along the eastern/northeastern flank of Butuan City, making it a cautious passage for aircraft flying to and from the open sea. This lack of ingress-egress on the eastern flank outside of the city's borders is, by itself, a notable handicap for a city that aspires for international linkages by air.

By the same token, however, Butuan's natural forest and biodiversity, especially in upland areas, give a high level of environmental value to the city. Mount Hilong-hilong and the Diwata Mountain Range protect the city from fierce Pacific storms and give a natural topographic beauty in terms of viewshed and corridor. Butuan's existing residual forests are currently utilized as production forests, or are reserved for military purposes. Furthermore, the existence of indigenous cultural communities (ICCs) and various forest tree species of economic importance such as dipterocarps and other premium species provide additional natural resources to be explored and protected. Locationally, these also form a barrier to outward development of the city, depending on whether one takes a more expansionist perspective versus a more conservationist one.

Field observations suggest that the relatively shallow Butuan Bay (<500 meters depth within 15 kilometers municipal waters), especially at the mouth of the Agusan River where siltation and obvious discoloration of water occurs, acts against its designation as a large-volume deep-water port that could otherwise challenge nearby Cagayan de Oro or even the smaller, adjacent Nasipit Port projected for expansion. However, there remains untapped potential for the waterfront of Butuan, especially in terms of industrial and logistical-support usages (e.g., towing and the operation of shallow-bottomed craft), rather than for beach tourism, due to the dark sand and marsh-like nature of the margin of the bay.

In terms of topographical and landscape features, it should be noted that Butuan City, especially in the less urbanized eastern side of the Agusan River, is densely fluviated, resulting in a mosaic of estuaries and closely-packed islands, especially along the coast, that offer potential for inland waterway transport systems. However, it can just as easily be filled in by urban sprawl and haphazard development. The same features, however, also suggest that if not managed and augmented with infrastructure properly, the profusion of rivulets, streams, and other waterways could lead to more flooding in the future, especially if pollution and built-up blockages prevent area-wide drainage from occurring to the same degree as at the present natural pace.

Figure 2. Butuan City in Relation to Mindanao and the Philippines

Source: Wikipedia, n.d.

Moreover, in certain sites, elected officials and the bureaucracy have recognized that it may even be possible to take advantage of the unique interface of landscapes and waterscapes to promote a vigorous and profitable ecotourism program, an idea which is supported by the current administration. This planned program is seen as a countermagnet to the lure of the mining and logging activities, apart from the fact that ecotourism adds to the diversity of economic activities that residents can engage in.

The Distance Factor: An Unemphasized Constraint

As mentioned in the introduction of this article, the research intended to problematize and recognize location as an inherent constraint to the attainment of a greater regional or international role for the city. Fieldwork findings

supported this hypothesis in so far as it can be shown that most of the distances from Butuan to points north, northwest, and southwest tend to be longer, hence less competitive than from Cagayan de Oro or Zamboanga, although Davao has similar constraints to Butuan, except for points south. Of course, Butuan can claim a "shorter-distance-to-travel" advantage to the east, where there are, however, no nearby destinations except Koror in Palau. Guam and Hawaii in the Pacific, for the purposes of this study, are too far away, and are more easily reached, distance-wise, when one flies out of Metro Manila. Similar conclusions can be drawn about airborne and seaborne access, making Butuan as an international destination-of-choice similar in peripheral nature to destinations like Perth (in Australia) or Sapporo (in Japan), which are discouragingly far, even if developed. The distances in question can be seen in Table 2.

Although local promoters may argue that the comparative distances are not far apart, and that Butuan might develop other winning qualities, it stands to be proven how the city can attract permanent or large-scale investors to such a location, especially since there are other urban magnets in Mindanao. Costs of movement of people and goods in and out of this city are likely to be higher in the long run, and cannot compete with nearby Davao, which has a deeper bay, especially in terms of marine transport.

Table 2. Distances to Consider Between Butuan and Other Points (via air or sea travel in kilometers [km] and nautical miles [nm])

Major Contact Point (Origin or Destination)	Butuan City	Versus Cagayan De Oro City	Versus Davao City	Versus Zamboanga City
Metro Manila	802 km (433 nm)	798 km (426.03 nm)	955 km (515.66 nm)	866 km (467.60 nm)
Cebu	264 km (142.55 nm)	223 km (120.41 nm)	386 km (208.42 nm)	426 km (230 nm)
Tacloban	264 km (142.55 nm)	313 km (169.01 nm)	452 km (244.06 nm)	576 km (311 nm)
Puerto Princesa	750 km (404.97 nm)	656 km (354.21 nm)	792 km (427.65 nm)	495 km (267.28 nm)
Jakarta (Indonesia)	2,662 km (1,437.37 nm)	2,560 km (1,382.29 nm)	2,543 km (1,373.11 nm)	2,234 km (1,206.26 nm)
Ho Chi Minh (Vietnam)	2,068 km (1,116.63 nm)	1,995 km (1,077.44 nm)	2,107 km (1,137.69 nm)	1,755 km (947.62 nm)
Koror (Palau)	999 km (539.42 nm)	1,092 km (589.63 nm)	990 km (534.56 nm)	1,366 km (737.58 nm)
Kaohsiung (Taiwan)	1,620 km (874.73 nm)	1,648 km (889.85 nm)	1,797 km (970.30 nm)	1,500 km (809.94 nm)

Political and Administrative Concerns

From an administrative point of view, Butuan City remains the regional commercial and institutional hub, even if nearby Cabadbaran City is the provincial capital. In that sense, it is also a co-location of political power. Legal and civil registry services, social security, health services, wet and dry markets, etc. are all visible in the downtown area where the researcher made transect walks in order to describe the unfolding of the built-up fabric. In general, it is notable to record that Butuan City is still a relatively low-slung (i.e., few high-rises) urban area, with most buildings not exceeding five to six storeys, and therefore presenting a pleasant panoramic aspect of evenly-distributed structures against the skyline. The main avenues are generally walkable during the day or night without posing the threat of crime. The traffic on most days moves at a modest pace, thus does not demand complex administrative solutions to congestion, unlike those found in other Philippine cities.

On the other hand, there is a de facto subcenter in the Caraga State University campus area in Ampayon, some six kilometers to the east of downtown Butuan. The area has an established road grid and promises to be a satellite hub for governance concerns. It has Philippine National Police and Bureau of Fire Protection establishments as well as a few commercial establishments. It is this area that represents the most logical place for residential expansion of the city. With the existence of a working infrastructure and the presence of a vibrant community life—primarily composed of university students—the development of the area seemingly only needs to be guided by light-handed regulation.

Apart from the strategic physical presence of government structures, it is important to appreciate the hierarchy that makes governance possible in this center of the Caraga Region. The LGU may design and implement its own organizational structure and staffing pattern based on the priority needs, service requirements, and financial capabilities as long as it is guided by the principles of simplicity, efficiency, economic effectiveness, dynamism, and public accountability subject to the guidelines of the Civil Service Commission and the 1991 Local Government Code. The City Government's organizational structure may be considered both fairly large and traditional but all services, both social and economic, are represented. A notable initiative is the attention to agriculture, tourism, and the economy with the inclusion and strengthening of the Economic Enterprise Office, Tourism Office, and the Agricultural Office in the official structure. Aside from the City Health Office, the city manages the Butuan Medical Center and its 330 employees. All departments in the city are under the direct supervision of the city mayor through the city administrator, who also handles special concerns and projects.

Part of the fieldwork concern was to determine how financially-capable Butuan City might be in view of its administrative targets for development

and its projected growth. The city derives the majority of its income share from the internal revenue allotment (IRA) and income from real property taxes. A portion or 23% of the total national IRA is allocated for cities, and each LGU shall automatically receive an IRA based on the LGU's population (50%), land area (25%), and equal sharing (25%). For the last five years, Butuan City's income grew 24.06% due to the increase in real property collection. In 2014-2015, the real property tax (RPT) collections increased by 260%, which is significant considering that collections were previously pegged at the Php70 million. From Php79,342,216.34 in 2014 the real property collection rose to Php277,828,896.00 in 2015. For 2016, real property collections increased to Php304,446,264.70 or an increase of 9.58% from the previous year. The indicated amounts are substantial in comparison to neighboring municipalities, and therefore indicate that Butuan City has the cashflows necessary to support large-scale expansion that is guided by rational administrative decisions and sound planning.

To broaden the financial picture, another important aspect is reliance on the IRA. For the same period, from 2014 through 2016, data from the Bureau of Local Government Finance (BLGF) has shown Butuan City to be about 70% IRA-dependent, given approximately 30%, 30%, and 29% derived from local sources (RPT-share, business tax, fees, and charges), in contrast to neighbors in Mindanao: Cagayan de Oro City at 47% IRA-dependent (vs. 55%, 53%, and 51% for the same years) and Davao City at 58% IRA-dependent (vs. 43%, 42%, and 42% for the same years). Although notably, from a geographically-remote perspective, similar cities on the Philippines' east coast have comparable IRA-dependency ratios, like Tacloban at 67% dependent (vs. 30%, 33%, and 35% local sources for the same years) in the Visayas, and the somewhat more dependent Sorsogon City in Luzon at 86% (vs. 14%, 13%, and 13% respectively). Although it may seem that Butuan still has a high dependency on transfers from central government, it may be counter-argued that collection efficiencies are generally above 90% for the abovementioned sources, and development is properly planned and targeted, as evidenced by the visible proliferation of public works.

It should also be mentioned that the current elected officials appear to be adept at sourcing foreign assistance, as the mayor has long-established linkages with Japanese investors and Japan's official development assistance program (e.g., rice mills and other agricultural machinery were donated by Japanese benefactors). This inflow of external capital investments and other forms of assistance relieve the city coffers and allow funds to be spent in multiple alternative areas for development. It is likewise worth noting that as of the time of writing of this article, Butuan City has been run by a new, reformist mayor who prioritized agro-industrial development and infrastructure to be anchored on updated development and land use plans. The incumbent mayor is independently wealthy, having made his fortune in the construction industry prior to joining local politics. So far though, the vision of the mayor to build up agro-industry and infrastructure (rather than mining and logging) as sustainable sources of

wealth remains largely a verbal assurance, as the comprehensive land use plan (CLUP) and, the comprehensive development plan (CDP) are still being revised and updated to reflect his priority programs, as of 2019. Another plus factor for Butuan is that the head of the Philippine Economic Zone Authority (PEZA) is a Butuan local, a fact that the Butuanon LGU staff pointed out as indicating that her favor is likely to shift towards them. She has indeed facilitated the paperwork for the development of in-city and port area economic zones, also to be guided by a proper planning exercise.

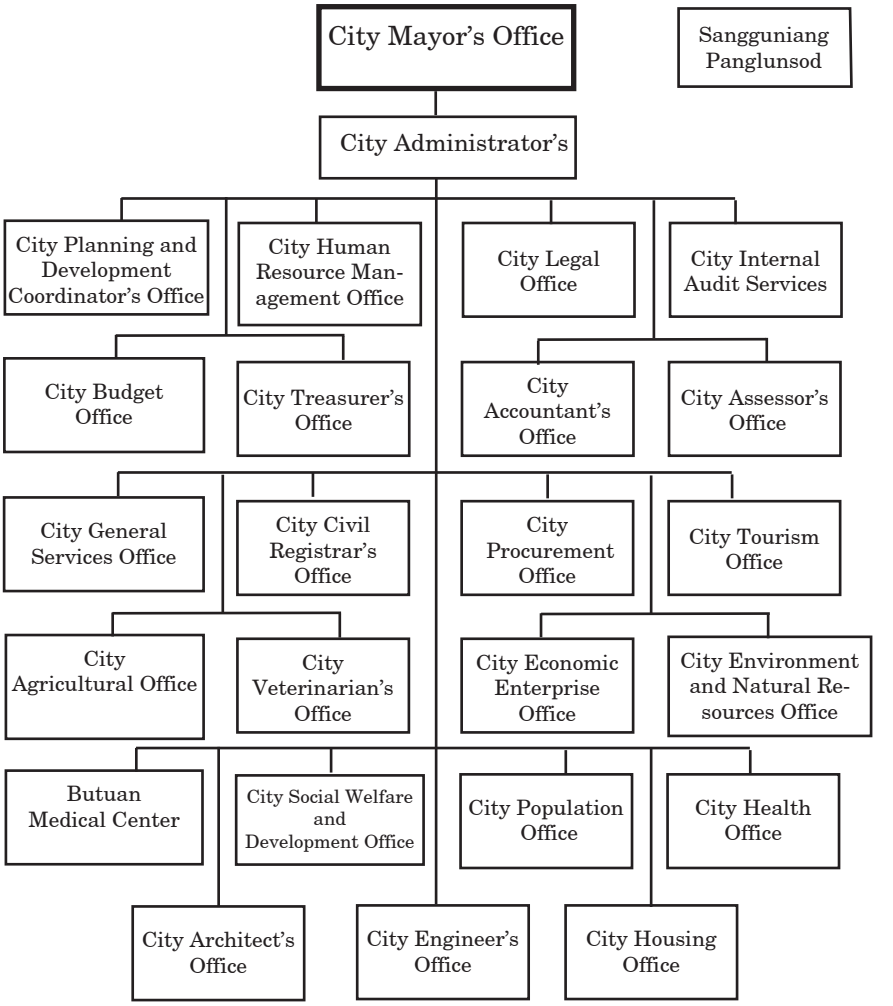
Together, and along with other supportive elected officials, these leading figures of Butuan have started an ambitious program of expansion and rationalization of settlement development. It is also the strategy of the present government to maximize the potential of Butuan City as the gateway and regional center among ten municipalities in Agusan del Norte and the rest of the Caraga Region, which means that more traffic of people, merchandise, and other socioeconomic throughputs will be invited into Butuan, and must therefore be anticipated.

What seems to has been lacking, however, in the formal and informal interviews of this author with officials, was an explicit admission by decisionmakers that the city has major locational or physical limitations, which might impede or delay its rise to a state of international utility. In this sense, the officials and the bureaucracy do not relate as comprehensively as they should to the potential or actual weaknesses of the city, although they tend to play up its strengths. Indeed, they adhere more to the official goals of the LGU, which if one were to review Butuan City's present Mission[2] and Vision[3], one would note a rather modest and therefore more realistic set of aspirations. The city reaches only for regional leadership, and has not yet adopted the more ambitious rhetoric of the mayor and his allies to internationalize the LGU. This more conservative position is, perhaps, a hidden advantage in so far as it does not overpromise for Butuan, and yet leaves room for rethinking or expansion of core aspirations and the practical steps that may be needed to overcome constraints.

Backing the decisions of the political leaders is a capable planning office with a department head and at least 12 other planning and project evaluation officers (ranks IV, III, and II), followed by some 20 rank-and-file clerks and job-order hires (Butuan City Government, 2013). While the office structure is what would be expected of a fairly wealthy secondary city, and the staff who interacted with the author and colleagues were competent, the present planning effort to revise the CLUP was outsourced through competitive bidding to infuse external expertise and to expedite the writing-in of infrastructure and economic development in a newer plan crafted as a result of participatory exercises with stakeholders. As of the writing of this article, the 2019 planning exercise for the CLUP is still ongoing and will later lead to more specialized plan formation. The local chief executive has demonstrated an inclination to hire outsourced

specialists when and where needed to inject new ideas to a planning staff who are already, by themselves, experienced and whose only visible need at the time of fieldwork was to fill in gaps in socioeconomic profile data.

Figure 3. Butuan City's Basic Organization



Source: Butuan City

Other Development-Related Observations

With somewhat over 337,063 (Philippine Statistics Authority, 2015) in population, Butuan City is not experiencing pressing population pressures and can afford to regulate and control expansion to a high degree. Its present efforts to update the CLUP represent an institutional commitment to rationalize development, especially in the area near the Bancasi Airport, the waterworks near Taguibo, and the Masao coastal industrial development area. Windshield surveys done for the research showed that most of the population and commercial activity is still relatively concentrated around the city proper (*población*), with small clusters of built-up areas scattered in haphazard fashion around it.

From data obtained from the planning office, employment statistics indicate that while Butuan City is geared toward fast urbanization due to its strategic location as the center of trade and commerce in the region, it still has a significant population who depend on agriculture as the main source of livelihood. Of the 125,644 or 55.55% of the labor force who are fully or partially employed, 13.35% (16,788) are employed as skilled agricultural, forestry, and fishery workers. Majority of these workers are male (87.58%). Of its total land area, 41.58% are utilized for the development of its major agricultural produce, namely rice, followed by other edible foodstuffs.

As reflective of the rest of Mindanao, agricultural crops, livestock, and poultry farms remain as some of the major sources of income in the city. Continuous urbanization and increase in commercial establishments have afforded Butuanons with the opportunity for diversified employment, but often only in low-income occupations such as elementary-level jobs and service and sales workers, hence pushing outmigration to other urban centers or abroad. There is therefore much opportunity for upscaling the human resource potential of the city and the rest of the province whose economy is dependent on the natural resource base. Ideally, the majority of the working-age population should not have to leave Butuan City, or Agusan del Norte at least, to be gainfully and adequately employed.

One other emerging development concern is disaster preparedness, which is another aspect of institution building. As one manifestation, the evacuation centers in Butuan appear to be inadequate for absorbing at least 50% of the population in case of any massive catastrophe. While the city government has a good command of disaster risk reduction and management (DRRM), it should remain aware that responses may have to be tailor-fitted to the settlements on both sides of the Agusan River, since there are only two bridges joining these (the Macapagal Bridge and the Magsaysay Bridge). Should the bridges be rendered impassable in case of a flood, earthquake, or other disastrous event, then the communities on both sides will have to stand alone and seek assistance to the

north and south rather than across the river. As an administrative concern, the capacity to handle adverse events seems to be adequately appreciated in the city government, in so far as DRRM plans and protocols are in place; what remains to be done is fine-tuning and mainstreaming of the same preparedness down to the grassroots level.

Analysis and Further Discussion of Fieldwork Results

Given the foregoing, the researcher can discern patterns that define the development constraints and potentials of Butuan City. As Tagliacozzo (2007) points out: while there are universalizing trends in global urbanization currently taking place across the planet, several Southeast Asian cities will adopt these new frameworks and institutions at least partly within a local model that is already several centuries old and relies much on intercity exchange, as seems to be the case too in Butuan City. For example, popular rhetoric that foregrounds globalized, "smart," and competitive cities may be—and has been—adopted superficially by Southeast Asian politicians and administrators. However, such a framework is more often altered subtly to fit local sociocultural contexts and power arrangements, as also mentioned in the closing paragraphs of the review of literature.

The widespread tacit acceptance of megacity growth is also a kind of new framework in Asia that Butuan may find itself growing into, which means it would have to plan and build for millions of residents soon. In the first place, its location still has the logic of equidistant proximity in so far as it commands administrative and commercial centrality of the northeast corner of Mindanao, albeit being peripheral to the rest of the landmass. Its ensconced geographic position prevents it from being a direct gateway to the Pacific by sea or land, or to the rest of Southeast Asia, since other cities and islands of the Philippines lie interspersed to the west and south. For many of the same reasons though, it may be remarked that it is placed in a superbly defensive position, even if external armed threat is not presently on the horizon in any sense. Geographically and topographically, its well-watered position makes it a challenge to administer, if one considers, first of all, the divide imposed by the Agusan River, and the remoteness of some of its hinterland barangays. For this reason, governance initiatives will require the establishment of satellite presence of law enforcement, health services, and other basic institutions in the rural fringe, combined with the more practical strategy of discouraging urban sprawl and the scattering of populations.

The present confluence of political and administrative actors favorable to Butuan is, in the long-run, a temporary advantage, hence must be capitalized on immediately. This is properly the time to fast-track infrastructure for urban areas, especially sewerage systems, roads to remote settlement clusters, and

bridges, as well as infrastructure for rural areas where farm productivity can be supported by dryers, granaries, cold storage, and mills for different harvested crops. However, ideally, these developments should also follow a well-crafted and participatory CLUP and CDP, whose formulation has been an ongoing activity as of the time of this writing.

It should be mentioned that in the eastern hinterland, the long-running, communist-inspired insurgency militates against widespread development. However, based on informal interviews with local government staff, insurgents can occasionally be induced to stand down, subject to negotiations, sometimes through trusted intermediaries, regarding livelihood and social justice issues. This indicates that governance concerns can be found to shade along a spectrum from the formal to the informal in Butuan City and the Caraga Region in general. It is also quite important from a political standpoint as it shows that the incumbent city mayor is astute enough to use various means of asserting, deploying, and sharing power where the city resources cannot be extended, and therefore some reasonable compromise must be reached with armed parties. As long as they do not make life unbearable for the rural folk in the hinterlands, it is understood then that they may exert some influence there, at least until the coming of infrastructure and agro-industrial employment being pushed formally from the center of politics and administration. From a theoretical and practical standpoint, the informal agreements, whatever they may be (as local interviewees declined to elaborate), between the elected officials and the insurgents in the eastern hinterlands, are proof of effective unorthodox or non-formal governance that allows growth.

Institution-building theory itself is a large and somewhat fuzzy package of approaches and ideas that are concerned with the betterment of structures and functions that enable government to implement its mandate efficiently, effectively, and in a socially-just manner. Institutions may be said to consist of "organizations + value" and their core growth depends on improving capacities, processes, and structures within a defined entity, but also emphasizes relationships and networks (Moore, Stewart, & Huddock, 1995), which is apparent in the expansive tempo of Butuan's present leadership. In such situations in which changes in formal rules occur within a stable political context and have relatively predictable effects on behavior, treating institutional change as an outcome of collective action and political interaction, as in the collective-choice approaches, has proven useful in many real-world settings—except where the effect of informal rules and customs must be taken into account when formal changes do not work or are not fully adopted (Kingston & Caballero, 2008).

The findings of this research could be the basis for other challenges, in so far as the effects of location might also be suggested as a foil to standardized or unimaginative institution-building initiatives. As a critique therefore, what the institution-building discourse tends to lack, is a discussion on the geophysical and

spatial element that in some cases makes it difficult to realize added value and ambitious plans unless locational constraints are worked-around or somehow used to gain advantage in unorthodox ways.

As for the other aspects of development, it is important that the diversification of the economic base of both Butuan and the Caraga Region as a whole continues, eschewing the old reliance on environmentally-harmful logging and mining activities, and enticing the citizens to engage in more environmentally-sustainable entrepreneurship. As McCann (2001) points out, cities are seen as increasingly entrepreneurial, in that the business and political elites who control urban economic policy have become focused on competition. This can somehow inadvertently cause the improvement of market conditions as more goods and services, with better quality, become available to the mass consumer base (McCann, 2001). This is no less true in Butuan City and its environs, since the cities and municipalities in the northern regions spanning the rest of Mindanao tend to be less prone to armed conflict and have several direct trading links to the Visayan islands.

Conclusion:
Prospects for Butuan City and Its Developing Milieu

By way of a working conclusion, the findings have shown that Butuan City is prosperous and has much room to expand. However, its peculiar geospatial constraints will probably drive its development into unique, tailor-fitted directions supported by a solid cultural identity dating back to precolonial times. In so doing, it shall resist the worldwide hegemonic essentialization of the Euro-American industrialized city that seems to be a model being adopted around the world. The most subtle transformation is the regulation of how space is used (Schindler, 2015), which will undoubtedly allow for the infusion of Filipino elements and patterns in the way the built-up areas are expressed, and will permit labor and capital to connect in hitherto untried ways.

More than other similarly-endowed cities in Mindanao, Butuan has the peculiarity of being not-quite a deep water port, nor a magnetic "go-to" destination by land or sea, and yet it is a regional anchor in Mindanao, and is arguably one of the major cities that may derive an advantage from constituting the Philippines' eastern border with the Pacific Ocean.

Such superficial constraints can be overturned and become advantages if built on creatively by empowered decisionmakers. Some possibilities for adaptation include:

1) Capitalizing on the geographic remoteness by marketing and building up Butuan as a refuge for less-mainstream investors or locators, such as

warehousing facilities, ship repair and emergency berthing as back-up for the more congested Cagayan de Oro, or as a destination for immigrants such as retirees (including overseas Filipino workers and foreign retirees). Non-mainstream tourism is also a corollary come-on.

2) Taking further advantage of its proximity to the Visayas and lower incidence of armed conflict to boost agricultural productivity by encouraging investment in value-added industries (processing, packaging, etc.) that can find immediate markets either in the neighboring islands or in Metro Manila.

3) Developing more reliable physical connectivity to east coast destinations like the resort areas along the entire coast of Surigao del Norte and Surigao del Sur, thereby serving as a reliable back-stop in case of tourist overflows, or as part of a circuit of places-to-visit. In other words, by clustering with other more (or less) accessible locations, Butuan can share in the socioeconomic dividends, which manifest as a type of spillover effect.

4) Safeguarding its environmental integrity through ecotourism and the limited use of its vast waterway network for transportation and irrigation. Officials of the city would do well to prioritize strict environmental management as a long-term strategy for sustainable development, as this is one of the few aspects where Butuan still has a clear advantage over other settlements in Mindanao, not to mention the fact that the landscape itself has yet-unassessed archaeological and historical significance. As a spin-off strategy, cultural heritage should also be safeguarded and promoted to complement the natural sites, especially in the older part of the city.

At present, Butuan is already working on the second and fourth recommendation by keeping good linkage with Visayan and other ports north, and by safeguarding its environment. Recommendation 3 is being implemented largely by national government under President Duterte's administration, hence allowing Butuan to benefit with little exertion of its own. It is only the first recommendation, premised on a humble acceptance of constraints, that is not yet being pursued.

All told, the development of this particular urban area is an administrative challenge that admits of many possibilities for innovative location of infrastructure and institutional services provision. What is important at this stage is to be able to see that while it does not have the apparent advantages of other coastal cities in Mindanao, Butuan still enjoys a relatively large land area, modest population, and abundant natural resources that can be creatively employed and promoted to generate a lasting prosperity for all its stakeholders.

Endnotes

[1] Highly Urbanized City is capitalized because it is a specific term derived from the Local Government Code of 1991 (Republic Act 7160).

[2] "The City of Butuan will strive to achieve the community's vision of a great, inspirational, competitive, liveable, and sustainable city."

[3] "Making Butuan a great hub city of opportunities for all that spurs and supports Caraga's sustainable growth and development."

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José Edgardo A. Gomez, Jr. is Associate Professor at the School of Urban and Regional Planning, University of the Philippines Diliman. He can be reached at jedgomez101@yahoo.com.

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Empowerment, Satisfaction, Commitment, and Retention Intention Among Women in the Military: The Case of the Philippine Navy

Michelle C. Castillo
National College of Public Administration and Governance
University of the Philippines Diliman

State policies and programs in the Philippines have paved the way for more women to participate in the peace and security sector, particularly in the military, in recent years. These policies are incorporated in the larger gender and development (GAD) policy of the government. This article assesses whether the GAD policies and programs actually translate to the retention of female military personnel in the Philippine Navy, one of the three branches of service of the Armed Forces of the Philippines. It measures the satisfaction of female military personnel on policies on women empowerment and protection against sexual violence, together with job satisfaction and organizational commitment, and evaluates whether these factors have an effect in their decision to stay or leave the military profession. The revised gendered model shows that the most significant factor affecting the intention of female soldiers of the Philippine Navy to stay is organizational commitment while job satisfaction has more direct and significant positive effect on organizational commitment, with satisfaction on women empowerment and participation having a direct positive effect on both organizational commitment and job satisfaction. The female soldiers' experience of sexual harassment in the organization lowers their level of satisfaction on the organization's programs on women empowerment and participation.

Keywords**:** *job satisfaction, organization commitment, Philippine Navy, retention intention, women empowerment*

The growing participation of women in the traditionally male-dominated profession of security and peacekeeping has been observed in recent years (Army Technology, 2018; Egnell & Alam, 2019; Swick & Moore, n.d.; United Nations Peacekeeping, n.d.). This comes as a result of an increasing recognition that women suffer disproportionately from armed conflict (ESCWA Center for Women, 2007; Kubota & Takashi, 2016) but are often excluded from the conflict resolution platforms (Barrow, 2016), setting the premise for the continuing paradigm shift that calls for greater role of women in the security agenda (Kumalo, 2015; Madzima-Bosha, 2013; Njoku, 2018; Onyegbula, 2018; Philippine Center for Islam and Democracy, 2018).

Several United Nations Security Council Resolutions (UNSCR) have articulated this plight of women in the security agenda and provided the framework of integrating the gender perspective in peacebuilding and conflict prevention and resolution across the globe. While military organizations may be seen as "hurdles or supporters in pursuit of peace and security," they are still arguably "key components in any strategy to promote women's rights or a gender perspective in security affairs" (Egnell, 2016, p.73). The gender equality and women empowerment agenda has argued for and created more opportunities for women to participate in the peace and security sector in general, and military organizations in particular.

In the Philippines, several laws and statutes have been legislated and implemented supporting the entry of women in the Philippine military. In 1992, Republic Act (RA) 7192, or the "Women in Development and Nation Building Act," opened the door for women to be part of the military as equal counterparts of men. Going beyond entry of women in the military and working within the larger gender and development (GAD) agenda of the government, the National Action Plan on Women, Peace and Security (NAPWPS) 2010-2016, recognized as the first national plan implementing UNSCR 1325 in Southeast Asia (Amling & O'Reilly, 2016, p. 29), specified the empowerment of women and ensuring their active and meaningful participation in various areas of peacebuilding and security in the country as one of its main purposes. This purpose was carried in the updated plan, the NAPWPS 2017-2022, in its fifth action point, which is to improve the role and status of women in the security sector, including military organization.

This study partly investigates how effective the efforts of the government have been in attaining this particular objective of recruiting and retaining women in the military. As a preliminary effort, it focuses on the experience of the Philippine Navy. Working on the premise that active and meaningful participation of women entails not only recruitment but also retention, the study evaluates the over-all job satisfaction, organizational commitment, and level of satisfaction or dissatisfaction of female military personnel on women empowerment and participation within the Navy, and assesses whether these factors affect their intention to stay or leave the organization.

Setting the policy context, the article begins by providing an overview of enabling laws and mechanisms promoting women's participation in the Armed Forces of the Philippines (AFP). The literature on retention and attrition and its more widely investigated antecedents, job satisfaction and organizational commitment, are then discussed. The framework and methodology are then presented, followed by a discussion on the results and a gendered model on retention intention in the Navy based on the findings. The article concludes with a presentation of several recommendations for policy interventions and future research.

Paving the Way for Greater Women Participation in Security and Peacebuilding in the Philippines

National Policies

Women warriors have figured in the Philippine history of uprisings and armed revolts. The names of Gabriela Silang, Melchora Aquino, and Gregoria de Jesus easily come to mind when one thinks of Filipinas who fought against the Spanish colonial rule in the country (Maligalig, n.d.). Even during the Filipino-American War and the Second World War, Filipinas had not only provided support but had also joined as frontline combatants (Depasupil, 2013; Maranan, 2010; National Centennial Commission, 1999).

In 1963, 28 years after the AFP was officially established through the National Defense Act of 1935, RA 3835 created the Women's Auxiliary Corps (WAC) in the AFP. It was the first law that formally instituted women's participation in the Philippine military. However, unlike the frontline roles they performed in the country's revolutionary history, the WAC was limited to non-combatant and administrative duties. Further, the law's provisions can be described as discriminatory and sexist (Hall, 2016). For instance, WAC personnel are explicitly prevented from entering into marriage before they have rendered at least five years of continuous military service.

It was not until 1992 when the government passed RA 7192 or "Women in Development and Nation Building Act" that equal opportunities were accorded to women in the military as with their male counterparts. Recognizing women as "full and equal partners of men in development and nation building," the law formally operationalized the principle of equality between men and women enshrined in the Philippine Constitution of 1987. It also translated locally the government's international commitment to gender equality through the United Nations Convention on the Elimination of all Forms of Discrimination Against Women (CEDAW) in 1981. The law explicitly provided for specific actions for this equality to be realized, among them mandating "equal opportunities for [women's] appointment, admission, training, graduation, and commissioning in all military or similar schools of the [AFP] and the Philippine National Police" (Sec. 7). Following its passage, the first batch of female cadets was welcomed by the Philippine Military Academy (PMA) in 1993.

Republic Act 7192 was further reinforced by the passage of the RA 9710 or the Magna Carta of Women in 2000. The latter explicitly required that women in the military be allowed "to contract marriage upon entry in military service or similar services, except for such positions where a marriage ban for a specific period of time is required for both men and women" (Sec. 18).

The GAD Budget Policy

Republic Act 7192 also set forth the GAD budget policy and explicitly provided for the allocation of a portion of official development assistance for policies and programs dedicated to gender issues. In 1994, the Department of Budget and Management (DBM), National Economic and Development Authority (NEDA), and the Philippine Commission on Women (PCW) issued a joint memorandum circular that has since served as the "policy framework for the integration of GAD in the development of programs, activities, and projects that promote gender-responsive governance and women's economic empowerment (Paderanga, 2010, p. vi). The following year, the 1995 General Appropriations Act (GAA) initiated the first GAD budget policy "that specifically mandates all government departments, bureaus, offices and agencies to set aside at least 5 percent of their total budget appropriations on gender and development" (Paderanga, 2010, p. vi).

National Action Plan on Women, Peace, and Security

In 2010, the government started implementing the NAPWPS. Forming part of the Philippine Development Plan 2011-2016, the NAPWPS was intended to implement two UNSCRs that "required parties in a conflict to respect women's rights and to support their participation in peace negotiations and in post-conflict reconstruction" (p. 1). First is the UNSCR 1325 issued in 2000, which "promotes and protects the rights of women and girls in armed conflict situation in terms of 1) participation of women in all levels of decisionmaking, 2) gender perspective in Secretary-General Reports and Security Council Missions, 3) protection of and respect for human rights of women and girls; 4) gender perspective in conflict processes; and 5) gender perspective in peacekeeping" (as cited in NAPWPS, 2009, p. 1). Second is UNSCR 1820 issued in 2008, which "[d]emands that all parties to armed conflict immediately take appropriate measures to protect civilians, including women and girls, from all forms of sexual violence... [and to enforce] appropriate military disciplinary measures and [to uphold] the principle of command responsibility, [train] troops on the categorical prohibition of all forms of sexual violence against civilians" (para. 17).

Purpose 2 of NAPWPS embodies the goal for empowerment and participation, by "ensur[ing] [women's] active and meaningful participation in areas of peacebuilding, peacekeeping, conflict prevention, conflict resolution and post-conflict reconstruction" (see Table 1).

Table 1. The Philippine National Action Plan on UNSCRs 1325 & 1820: 2011-2016 (Purpose 2)

Action Point	Result Statement	Indicators	Timeline	Key Actors
Purpose 2	*Empowerment and participation* To empower women and ensure their active and meaningful participation in areas of peacebuilding, peacekeeping, conflict prevention, conflict resolution, and post-conflict reconstruction			
Outcome 2 & indicators	Women are significantly represented and play a decisive role in peace and security bodies, processes and mechanisms Number of women in peace and security bodies, processes and mechanisms			
6. Develop non-discriminatory policies that address the situation of women in the security sector	6.1 Policy reforms and programs developed, instituted and implemented to address situation and concerns of women in the security sector, particularly their protection and well-being.	6.1.1 Non-discriminatory policies on admission, promotion, remuneration, benefits, facilities and other employment opportunities among women and men in the security sector are in place. 6.1.2 Policies that protect women in the security sector against all forms of sexually-related violence and harassment developed and implemented 6.1.3 Number of women assigned and promoted in decision-making bodies 6.1.4 Number of women enrolled or admitted into training institutions for military, police, and other similar services	2016	AFP-DND, PNP, NAPOLCOM, PPSC (e.g., PNP), PMA and other related training institutions

Source: NAPWSP 2011-2016, 2009, pp. 15-16

Under NAPWPS 2017-2022, the role and status of women in the security sector is the focus of Action Point 5 with the desired outcome of women and girls as active change agents in conflict transformation and post-conflict development through meaningful participation and leadership (see Table 2).

Table 2. The Philippine National Action Plan on Women, Peace and Security 2017-2022 (Substantive Pillar 1, Action, Point 5)

Impact Statement	Contributed to the expansion of women's role in the peace process and conflict transformation and to the protection of their human rights in conflict situations
Substantive Pillar 1	Empowerment and participation
Outcome statement	Women and girls, through meaningful participation and leadership, are active change agents in conflict transformation and post-conflict development.
Overall strategy	Application of the gender approach in all procedures and mechanisms of the peace process, including post-reconstruction that seeks to address gender inequalities in the politico-economic lives of women as well as institutional reforms in the security sector to improve the status of women.
Action Point 5: Improve the role and status of women in the security sector	5.1 Policy and comprehensive programmatic design formulated for the recruitment, training, deployment, and career-pathing of women in the military and the police. 5.2 Enabling institutional mechanisms for the strategic maximization of women's contribution in the security sector created. 5.3 Increased the number of women in decision-making positions in the military and the police. 5.4 Increased the number of women in leadership positions specific to in civil-military operations (CMO) and community-police relations (CPR). 5.5 Increased number of women participating in international committees and inter-state initiatives (e.g., UN Peacekeeping, ASEANAPOL, INTERPOL etc.) related to gender, conflict-related sexual and gender-based violence (SGBV) and human trafficking, and WPS.

Source: National Steering Committee on Women, Peace and Security, 2016, p. 13

GAD in the DND-AFP

Gender mainstreaming efforts began in DND and its bureaus as early as 2001 (NCRFW, 2002) and national policies on women participation and empowerment in the security sector have been translated and localized in the department. These include:

1) Department Circular (DC) No. 1 on Use of Non-sexist Language in All Official Documents, communications, and Issuances in the DND (2011);

2) DC No. 2 on Guidelines in Annual Gender and Development (GAD) Planning and Budgeting (2011);

3) DC No. 3 "Guidelines on the Composition, Designation, Roles, and Functions of GAD Focal Point Committee at the DND Proper and its Bureaus" (2011); and

4) DC No. 4 on "DND Gender and Development Reporting and Monitoring System" (2011).

Following the release of the PCW Memorandum Circular No. 2011-01 on "Guidelines for the Creation, Strengthening, and Institutionalization of the Gender and Development (GAD) Focal Point System" and the AFP General Headquarters' Letter Directive No. 30 in 2010 that established the AFP GAD Focal Point System, the Navy created its GAD Focal Point System in 2012 through Standard Operating Procedure (SOP) No. 12. GAD-related activities have also been consistently programmed in the annual plan and budget (APB) since 1995. One of the tangible results was the increase in the number of female military personnel over the years–from a mere 270 in 2008 to 1,648 in 2016, based on the monthly consolidated report for this relevant period.

Viewed from the vantage point of NAPWPS, the Navy's GAD program aimed to empower and ensure meaningful and active participation of female sailors and marines in the organization. The Navy situates its GAD agenda within its long-term plan called the Strategic Sail Plan 2020. Under the Sail Plan, the Navy incorporated its GAD program in one of the four pillars of its human capital strategy, which is innovative retention program. This is the context within which the assessment of the effectiveness of the GAD program of the Navy is situated in this study.

In Focus: Retention in the Military

Personnel retention is critical to military organization because they need to maintain the morale and a level of unit readiness to accomplish their mission, which boils down to national security, as well as "reduce the costs for recruiting, training, replacement of manpower" (Sminchise, 2016, p. 85). Unwanted or unexpected attrition level is costly to the military organization (McKensey, 2017). For military organizations, recruitment is limited to lateral entrants, thus replacement is limited to the internal labor market. Voluntary turnover that exceeds expectations in different positions in the military hierarchy causes gaps in leadership and experience, which are the "foundations of warfighting effectiveness" (Lowell, 1987, p. 6). In general, retention and attrition, and factors that affect employees' decision and intent to stay or quit any organization, have generated much interest not only in the behavioral and management sciences but also in organization studies and public administration because of the costs of turnover to the organization, namely separation costs, replacement costs, and training costs (Wright & Bonnett, 2007) and its effects such as "lost tacit knowledge, fewer seasoned mentors, work disruptions, damaged client relationships due to discontinuity, and an overall reduction in organizational effectiveness" (Reina et al., 2018, p. 5).

Despite differences in the nature, structure, and even culture of military from civilian organizations, the study of Capon, Chernyshenko, and Stark (2007) on the New Zealand Army established the applicability of several aspects of civilian retention theories in military settings. Noting the limited research done to assess the appropriateness of civilian retention theories to military organizations, they developed and tested the *personal choice* military retention model, which shows that intentions to remain in the military service is highly related to factors of (1) community involvement, (2) job involvement, (3) organizational commitment, and (4) work satisfaction.

This is resonated by more recent general retention studies in the military. Sminchise (2016) cites the Research and Technology Organization's Technical Report (2007) that enumerates several financial, social and psychological, and military organizational factors that affect retention in North Atlantic Treaty Organization (NATO) member states' armed forces, and the unofficial United States Navy Retention Study (Snodgrass & Kohlmann, 2014) that showed three major factors behind retention: quality of work, quality of life, and quality of leadership. Some studies focused on organizational factors, such as Braybor (2018), which investigated job dissatisfaction among police officers; Trainor and Kim (2017), which focused specifically on compensation issues in the US military; and Vasterling (2015), which found that perception of unit support during deployment is a significant predictor of attrition among US soldiers who served in Iraq. Other retention studies in the military looked at individual factors, such as the effects of time perspective (Gaddy et al., 2018); psychological factors such as grit (Eskreis-Winkler et al., 2014) and psychological health (Cunha et al., 2015), generation (Neal, 2017); and marital status, number of dependents, and period of deployment and military service (Talis, 2015; Vasterling et al., 2015).

In the Philippine context, the study on Philippine Navy's officer resignation (Center for Naval Leadership and Excellence, 2009) provides an assessment of the relationship between overall job satisfaction and intention to remain or leave the organization. The study established a negative correlation, albeit weak, between overall job satisfaction and the possibility of leaving the service. A study by Navera (2010) identifies several factors, most of them pertaining to organizational factors, that contribute to the attrition of pilots from the Philippine Air Force. These include low remuneration, housing problems, unrealistic policies on service obligations, inadequate medical and dental benefits and other morale incentives, lack of aircraft or obsolete aircraft in inventory, inequitable schooling opportunities and the pressing demand for commercial pilots outside.

A Gendered Perspective on Retention in Military Organizations

Several studies have viewed retention in the military from a gendered lens, often looking at family factors, such as marital status and children;

organizational factors such as job satisfaction; and gender-based experiences. The study of Lowell (1987) on the United States Navy identified biodemographic, economic, family and job-related factors affecting turnover of female officers in the short and long term. Job satisfaction and promotion opportunities had the most significant effect on decision to stay. Family factors, particularly marital status and children, have little effect, however. Edwards (1989), however, showed a different result in examining family factors and their effects on the re-enlistment behavior of female enlisted personnel of the United States Armed Forces. She observed that "single and married women with children reenlisted at higher rates than did single and married women without children," (Edwards 1989, p. 62) observing further that economic reasons to support their family and flexibility in job transfer contribute to the tendency. In a more recent study, Smith and Rosenstein (2017) investigated the gendered differences and impact of family in retention intentions of students of US Naval Academy and found that family formation intentions have a significant effect on retention intentions of future female naval officers. Relatedly, Bandy (2019) found that child care and operational tempo[1] were the major factors behind leaving active service for US Army female officers who are also mothers.

A study on the effects of gender and trauma to attrition among recruits in the United States Marine Corps in 2005 showed significant difference in the rate of attrition between male and female recruits (Caufield et al., 2005). More than focusing on comparing attrition between genders, they recommended for a deeper understanding of the reasons of attrition for each gender. Antecol and Cobb-Clark (2001) used "sexual harassment" as a moderator variable in assessing the relationship between job satisfaction and intentions to remain in the military. They observed that "experiencing a sexually harassing behavior is associated with reduced job satisfaction and heightened intentions to leave the military" (Antecol & Cobb-Clark, 2005, p. 14). This is resonated in a more recent study by Dichter and True (2015), which showed that "gender-based experiences, including interpersonal violence, harassment, and caregiving needs" (p. 187) precipitated voluntary attrition among 35 US women veteran soldiers.

In the context of the Philippines and in the AFP, it is an explicit goal of the NAPWPS to institutionalize programs that will ensure the continuous and increased participation of women in different agencies involved in these areas. Albeit not touching on retention or attrition, Hall (2016) dwells on gender and religion in the military organization and provides an in-depth picture of the experience of Muslim women in a Christian- and male-dominated Philippine Army. Aside from this, however, there is a need for more studies on women in the Philippine military and the factors that affect not only their decision to join the organization but also their decision to stay in the military service.

Research Design and Methods

This study aims to fill this gap by proposing a gendered framework in assessing retention of women in the Philippine military. Set within the expressed goal of policies to enhance women empowerment and participation in the military and in the Philippine Navy in particular, the study answers the following questions:

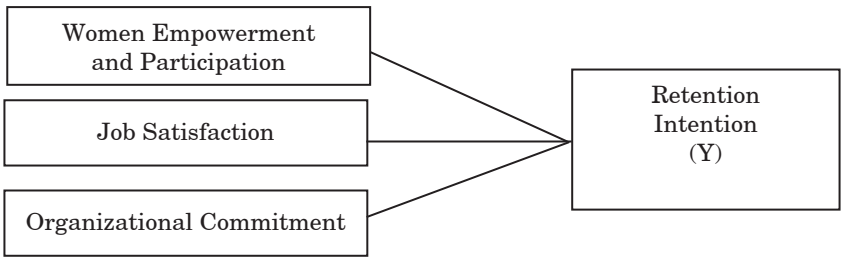
1) Do the level of satisfaction on the promotion of women empowerment and participation, job satisfaction, and organizational commitment significantly affect the intentions of the female military personnel to stay or leave the service?

2) What possible courses of action can be taken in order to strengthen GAD programs in the Navy?

Conceptual Framework

Based on the literature review, the study proposes a simple model (see Figure 1) that posits women empowerment and participation as a factor that directly influences the retention intentions of female military personnel. It also includes two of the most widely investigated factors of personnel retention and attrition: job satisfaction and organizational commitment. This study tests this model which asserts that a gender dimension, operationalized through women empowerment and participation, is external to these two predictors of retention in the military organization.

Figure 1. Conceptual Model on Retention Intention of Female Soldiers in the Navy



Hypotheses

Given the objectives and research questions, and based on the model above, the following are the hypotheses that the research tested:

Hypothesis 1: The higher the level of satisfaction on promotion of women participation and empowerment in the Navy, the higher is the likelihood of the individual's decision to stay in the organization.

Hypothesis 2: The higher the level of job satisfaction, the higher is the likelihood of the individual's decision to stay in the organization.

Hypothesis 3: The higher the level of organizational commitment, the higher is the likelihood of the individual's decision to stay in the organization.

The effects of rank, age, and marital status on retention intention were also tested.

Method and Variables

The variables were measured at the individual level. The study distinguished between commissioned and non-commissioned officers of the Navy.[2] The concepts in the framework above were operationalized using the following guideposts:

Retention intention (y) was measured by asking the respondents whether they will decide to stay given other job opportunities outside the Navy and regardless of standing bonds or contracts that they have with the organization. Retention intention was used as a proxy measure for actual retention decision, as "intention to stay" has been identified as highly correlated with the actual decision to stay or re-enlist (Griffeth, Hom, & Gaertner, 2000).

Satisfaction on promotion of women empowerment and participation (x_1) was measured using 10 five-point Likert-type questions that cover the two indicators based on Purpose 2 (empowerment and participation) of NAPWPS (see Table 1), which are: (1) satisfaction on promotion of equality on admission, promotion, remuneration, benefits, and facilities; and (2) satisfaction on protection against all forms of sexually-related violence and harassment. The 10 questions covered the areas of recruitment, promotion, organizational culture, and mechanisms to address sexual harassment. A question on whether they have experienced sexual harassment or violence in the Navy was also included. This was used to also test the moderating effect of sexual harassment, as found by Antecol and Cobb-Clark (2005). The instrument was tested for reliability, generating Cronbach's alpha of 0.9.

Job satisfaction (x_2) was measured using the short-form Minnesota satisfaction questionnaire, which uses 20 dimensions of job satisfaction.[3] Raw scores, which would range from 20 to 100, were used. Meanwhile, *organizational commitment* (x_3) was measured using a 15-item organizational commitment questionnaire used by Mowday, Steers and Porter (1979). Raw scores were

divided by 15 to derive the summary indicator of the level of commitment. Both instruments have been widely used in retention/attrition studies.

The *respondents' age* was grouped into age brackets (x_4). Likewise, their *rank* (x_5) were grouped into junior, middle-grade, and senior. Finally, *marital status* (x_6) was measured by asking the respondents on whether they are single, married, widowed, or separated.

Methodology

The sampling frame covers all the female military personnel of the Philippine Navy, which included a total of 1,648 female commissioned and non-commissioned officers as of 1 October 2016. Random sampling required a total sampling size of 312 respondents. However, only 80 respondents were able to participate in the survey conducted from November to December 2016, yielding 25.64% turnout with 77 valid responses. Out of the 80 respondents, 73 are sailors and only seven are Marines.

A survey was the main data gathering method for the research. With the permission and assistance of the Office of the Assistant Chief of Naval Staff for Personnel, N1 (O/N1), survey questionnaires were distributed to the respondents through online platform and hard copies. All survey participants were informed of the purpose of the study and the nature of the questions. They were given the option to remain anonymous and skip questions. All personal information provided were kept confidential.

Scope and Limitations

In investigating personnel turnover in the military, one must remember that there is what the institution calls as "natural attrition," which maintains the ideal pyramid structure of any military organization. This means that only a particular number of personnel is maintained at every level of the hierarchy and thus a number will inevitably have to leave the organization at a certain point in their career. Based on the principle of meritocracy, personnel are forced to leave the organization if they do not meet particular requirements such as trainings, billets (positions), and physical fitness. The subject of this study is voluntary turnover, or retention and attrition that are due to the personal decision of the military personnel.[4] Further, this study measured the satisfaction of the respondents on the Navy's GAD program, which are presumed to be in support to the NAPWPS 2010-2016 and does not cover the succeeding action plan, NAPWPS 2017-2022.

Some challenges were met during the conduct of the study. Among them the difficulty in administering the survey to respondents who were assigned in remote areas in the country. While the Office of Personnel provided their assistance in distributing the survey through channels, several respondents

were not able to give their answers either in time for the completion of the study. Limitation in time and resources also prevented the conduct of focus group discussions and interviews, which could have enriched the analysis of the survey results. Lastly, some information were not readily available or were not allowed to be included in this study because of their confidentiality.

Results and Discussion

Out of the 77 valid responses, 83% or 64 respondents said they will stay or re-enlist in the Navy, given other job opportunities outside and regardless of standing bonds or contracts that they have with the organization. The average satisfaction score on the Navy's programs on women empowerment and participation is 41.17 (out of 50). Using the individual raw score on job satisfaction and individual average score on organizational commitment, the average scores of the sample were 81.82 (out of 100) and 5.80 (out of 7) respectively.

The modal age range of the respondents is 28-35 years old and most belonged to junior-grade rank at the time of the survey. Thirty-eight respondents are married, 38 are single, and only one was widowed or separated.

Shown in Table 3 is the summary statistics for the variables used in this study:

Table 3. Summary Statistics

Variables	Mean	Mode	SD	Minimum	Maximum
Dependent variables					
Retention Intention	--	Yes	0.37	--	--
Independent variables					
Satisfaction on promotion of women empowerment and participation	41.17	--	7.04	25	50
Job satisfaction	81.82	--	10.05	40	98
Organizational commitment	5.80	--	0.75	3.87	6.93
Age bracket	--	28-35 years old	--	19-27 years old	51-56 years old
Rank	--	Junior-grade	--	Junior-grade	Senior-grade
Marital status	--	Single/ Married	--	--	--
n=77					

Using logistic regression, the results, as shown in Table 4, reveal that out of the six predictors of retention intention, only organizational commitment is statistically significant, proving hypothesis 3 that the higher the level of organizational commitment of an individual female military personnel, the higher is the likelihood of her choosing to stay in the organization.

Table 4. Logistic Regression Results for the Entire Sample

	Estimate	**Standard error**	**z-value**	**p-value**
Intercept	-6.991875	3.506800	-1.994	0.094*
Satisfaction on Promotion of Women Empowerment and Participation	0.030808	0.060107	0.513	0.6083
Job Satisfaction	-0.005636	0.060107	-0.116	0.9075
Organizational Commitment	1.388817	0.569598	2.438	0.0148*
Rank	1.324554	0.985867	1.344	0.1791
Age Bracket	-0.886498	0.567757	-1.561	0.1184
Marital Status	0.074265	0.790682	0.094	0.9252
n=56				

Significance codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
(Dispersion parameter for binomial family taken to be 1)
Null deviance: 69.920 on 76 degrees of freedom
Residual deviance: 51.863 on 70 degrees of freedom
AIC: 65.863
Number of Fisher Scoring iterations: 6

When stratified according to the type of personnel (commissioned or non-commissioned officer), only organizational commitment was statistically significant predictor of retention intention for commissioned officers while no predictor appeared to be significant for enlisted personnel (see Table 5).

Since satisfaction on women empowerment initiatives has no significant impact on the retention intentions of the respondents, further tests were done to assess whether it has a mediating effect on the level of organizational commitment and job satisfaction. Simple regression analysis showed that the level of satisfaction on women empowerment and participation has a significant effect on the level of organizational commitment (t = 5.453, df = 75, p-value = 6.08e-07) and job satisfaction (t = 4.197, df = 75, p-value = 7.34e-05) of the respondents. Meanwhile, there is a positive correlation between job satisfaction and organizational commitment (t = 4.7917, df = 75, p-value = 8.157e-06). Interestingly, the test showed that the level of satisfaction on women empowerment and participation is negatively affected by the respondent's own

experience or lack thereof of sexual harassment (t = -2.2391, df = 75, p-value = 0.02812) and significantly affected by which type of personnel the respondent belongs (t = 4.7041, df = 75, p-value = 1.138e-05). Female enlisted personnel are more satisfied on the Navy's programs on women empowerment (mean = 46.62, sd = 4.03) than female Navy officers (mean = 39.125, sd = 6.85). Using Mann-Whitney U Test, this difference is statistically significant (U=202, with p-value = 9.718e-06).

Table 5. Logistic Regression Results for the Commissioned Officers

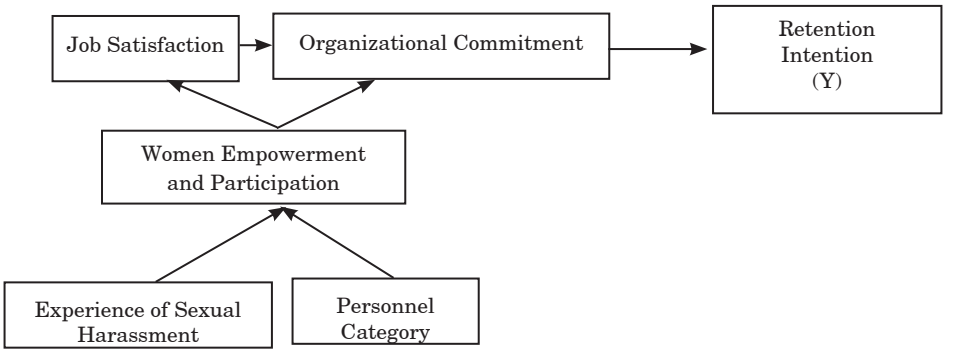
	Estimate	**Standard error**	**z-value**	**p-value**
Intercept	-0.04918	3.72175	-1.112	0.2661
Satisfaction on Promotion of Women Empowerment and Participation	-0.04918	0.07117	-0.691	0.4896
Job Satisfaction	-0.03865	0.06289	0.615	0.5389
Organizational Commitment	1.81997	0.77725	2.342	0.0192*
Rank	0.38915	0.77725	0.368	0.7131
Age Bracket	-0.56633	0.56801	-0.997	0.3187
Marital Status	0.66509	0.86878	0.766	0.4439
n=56				

Significance codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
(Dispersion parameter for binomial family taken to be 1)
Null deviance: 58.193 on 55 degrees of freedom
Residual deviance: 46.364 on 49 degrees of freedom
AIC: 60.364
Number of Fisher Scoring iterations: 5

Based on these results, a revised model explaining individual retention intention of female military personnel of the Navy is derived (Figure 2).

The revised gendered model shows that the most significant factor affecting the intention of female soldiers of the Philippine Navy to stay is organizational commitment. Unlike previously predicted, job satisfaction has an indirect effect only on retention intention and has more direct and significant positive effect on organizational commitment. Likewise, the findings of the study did not support the main hypothesis that the level of satisfaction on women empowerment and participation directly affects retention intention. However, it showed that it has a direct positive effect on both organizational commitment and job satisfaction. Finally, the female soldiers' experience of sexual harassment in the organization lowers their level of satisfaction on the organization's programs on women empowerment and participation.

Figure 2. Gendered Model on Retention Intention of Female Soldiers in the Philippine Navy



The strength of the impact of organizational commitment on the female soldiers' intent to stay in the Navy can be explained by the nature of the military profession and what it demands from its members. Commitment is manifested in the individual's willingness "to give something of themselves" (Mowday, Steers, & Porter, 1979, p. 226). Arguably, it is in the military organization where one can find the highest call to commitment from each member, demanding not only something of themselves but their very lives. As a profession of arms, it becomes inherent in every member of the Philippine Navy not only to accept but even embrace that they are called to give more than what ordinary civilians are expected to give in their service. From the time they enter the service, they are already conditioned to shed their civilian lives and mindset, which tell them that they are their own, and adopt the military life and mindset as they don their uniform and accept that they are instruments of the state. In their trainings, they are taught to have the highest loyalty to the country, to the organization, and to their comrades. The nature of the military organization naturally cultivates the loyalty of every individual solider, to the point that they define their identity and beliefs based on the creed of the military profession. This is maintained through its rigid hierarchical structure, where every personnel is conditioned to be submissive to authority and to waive their rights as private individuals. Their affiliation to the military and the discipline required to remain part of the organization become a source of pride for the soldiers.

If an individual is aware that he or she may one day be called to give up his or her life and he or she still remains committed to this organization, then all other demands of sacrifice for the organization pales into comparison. Intuitively and as the test showed, the respondent's commitment to the Philippine Navy most naturally translates to commitment to stay in the Navy. In addition, while they are aware that military service carries the call to lay down their lives, the respondents may have perceived that this scenario is less likely to happen in the immediate future given that there is no imminent war or conflict involving the maritime domain of security where the Navy operates. The current focus of the

AFP is internal security, hence the focus of the Navy is more on building up its capability for territorial defense while being tapped for humanitarian assistance and disaster response operations. The case would be different, however, for uniformed personnel of the Philippine Army or the Marines, who are still part of the Navy because they face greater risks of mortality or injury given the ongoing conflict due to secessionist and insurgent movements as well as threats from terrorist groups.

The correlation between job satisfaction and organizational commitment tells us that for soldiers to be willing to give something of themselves, they must be able to perceive that the organization is worth their sacrifice. They must possess the positive feeling towards the nature and area of assignments, prospects of career progression, and their commanding officers, among others, if they are to remain committed to their oath as soldiers.

The respondents' perception on how the Navy promotes women empowerment and participation addresses several aspects of both organizational commitment and job satisfaction. We can infer that the commitment of the respondents to the Navy is a response to the perceived willingness of the organization to promote their welfare. Particularly in the organization that is primarily dominated by men, programs that directly benefit women is an indication that the organization is willing to going out of its way—to this context, to break the status quo of male-dominance—and to show it values women as members and equals of men. On the same note, the level of satisfaction on women empowerment and participation directly corresponds to the policies and programs on admission, promotion, remuneration, benefits, and facilities, as well as protection against all forms of sex-related violence and harassment, which cover similar areas that are measured in job satisfaction.

Interestingly, the test showed that female enlisted personnel are more satisfied on GAD programs of the Navy compared to the officers. This finding appears to be counter-intuitive, given that in the military organization, personnel policies give more privileges and benefits to those in the higher echelon, in this case to the officers compared to the enlisted personnel. However, more female officers have experienced sexual harassment than enlisted personnel from the sample. Out of the 18 respondents who said they have experienced harassment in the organization, 16 were officers and two were enlisted personnel. As the test showed, experience of sexual harassment significantly reduces the satisfaction of women on the Navy's promotion of their welfare. Promises of protection and promotion of welfare of women become shallow rhetoric to those who have experienced sexual harassment in the organization.

Conclusion

This study set out to investigate retention in the Philippine military from a gender perspective, working within the context that it is the policy of the state to ensure the active and meaningful participation of women in all levels of decisionmaking and areas of peacebuilding, peacekeeping, conflict prevention, conflict resolution, and post-conflict reconstruction. As more women join the military and as the profession of arms continues to embrace the agenda of gender equality, it is imperative to identify the factors that would make women stay in the organization. This is more pressing in the context of the Philippine military where efforts to study factors affecting personnel retention, particularly from the lens of gender, have been limited.

Gender is indeed an important element not only in managing any organization's human capital but also in adhering to the larger principles of justice and equity in the development agenda. While the level of satisfaction of the female soldiers on the promotion of women empowerment and participation does not significantly affect their intention to stay or leave the Navy, the analysis showed that it positively affects organizational commitment, which is the stronger predictor of retention intentions, with job satisfaction as a mediating factor. This validates the necessity and value of the resources that are used to promote the welfare of women in the Navy.

It should be noted, however, that there are limitations in taking the findings of the study to reflect the general situation in the Navy and in the military, given the limitations in the sampling that were encountered during the implementation of the study. Nonetheless, we can safely assume that the Navy is on the right track in situating its GAD program within the framework of its Innovative Retention Program. Given the results of the study, the Navy can further strengthen this approach by focusing more on institutionalized mechanisms that would prevent and address sexual harassment in the organization.

Moving forward, as the government continues to advance the role of women in the peace and security sector, the Navy and the AFP, on their part, can build on their success of recruiting more women in the military service by not only aiming to retain them but also in providing more avenues for their meaningful participation. As outlined in the NAPWPS 2017-2022, policies and comprehensive programmatic design must be formulated for the recruitment, training, deployment, and career-pathing of women in the military and the police. Further, institutional mechanisms for the strategic maximization of women's contribution in the security sector must be created, and this is related to the goal of increasing the number of women in decision-making positions in the military, specifically in civil-military operations.

This study opens the space for a serious consideration of initiatives such as evidence-based research on gender and development in the military. Nevertheless, this is only an initial step and the points raised in this study can be further scaled up. Future studies should improve the methodology and enlist the help of the institution. The study only covered retention of women in the military. With the NAPWPS 2017-2022 already in implementation, future studies can consider covering the action plans and issues on women in the military, such as the kinds of role they are given and the issue of sexual harassment, as well as other organizations in the government and the civil society that are involved in promoting the meaningful participation of women in the security sector.

Endnotes

[1] Operational tempo is defined as the rate of military actions or missions that include deployments, training, and missions (Castro & Adler, 1999, as cited in Bandy, 2019).

[2] Commissioned officers are career military personnel who have security of tenure and occupy managerial and leadership positions. Meanwhile, non-commissioned officers are non-career personnel who have the option to re-enlist every three years. They may be considered as the "rank-and-file" employees in their civilian counterparts, and constitute the bulk of any military organization.

[3] Ability utilization, achievement, activity, advancement, authority, company policies and practices, compensation, co-workers, creativity, independence, moral values, recognition, responsibility, security, social service, social status, supervision (human relations and technical), variety, and working conditions.

[4] Wells et al. (2014), citing McPherson (1976), defined voluntary turnover as "the process of an individual making the decision to stay or leave an organization" (p. 64).

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Michelle C. Castillo is a University Researcher at the Center for Local and Regional Governance of the National College of Public Administration and Governance, University of the Philippines Diliman. For inquiries regarding the article, she can be reached at mccastillo2@up.edu.ph.

Social Network Analysis on the Information Exchange of Sorsogon City's CDRRMC during Typhoon Nina

Nissi Abigail J. Buenaobra
Office of Civil Defense

Aries P. Austria
Provincial Government of Palawan

Hannah Trisha M. Calucin
House of Representatives

Gianna C. Capacia
Department of Budget and Management

Joel L. Dela Paz, Jr.
Department of Information and Communications Technology

The local government units (LGUs) act as frontline agencies in disaster response. To ensure the welfare of their constituents, they perform necessary emergency measures before, during, and after disasters. Crucial to the LGUs' role is an effective information exchange network with other government agencies, private entities, and nongovernment organizations. Information exchange during disaster response has been a recurring challenge for authorities as the variables are complex, the environment is unpredictable, and the information demanded and supplied varies. By using social network analysis (SNA), this study explored the information exchange in the interorganizational network of key actors during the disaster response for Typhoon Nina (Nock-Ten) in Sorsogon City, Philippines in 2016. By generating a visual map of the network, SNA enabled the authors to identify the possible information exchange failures, central suppliers and consumers of information, vehicles of information, and macro-level assessment of its effectiveness. This article strengthens the proposition that the actors in the communication network are all essential in the prompt delivery of services during the typhoon. The evident interaction of actors further established a holistic and substantive information, which helped them make informed decisions for their response efforts.

Keywords**:** *information exchange, communication network, interorganizational network, social network analysis, disaster response, disaster risk reduction and management council*

Information is an indispensable commodity during disasters as it is a form of disaster response which, for the most vulnerable people, may be their only type of preparedness (Shimizu as cited in International Federation of Red Cross and Red Crescent Societies [IFRCRCS], 2005, p. 11). Accessible and timely information is imperative as it connects affected communities with their responders and other support systems (Jain, 2001; Tompson, et al., 2013). According to Shibin Tad and Janardhanan (2014), an effective information system plays an important role in empowering the key actors involved in disaster management through proper utilization and dissemination of needed information. It also helps reduce casualties within the community by dispensing concise information to various stakeholders. Lack of access to information can threaten people's survival, resources, and livelihood. This applies, not only to the community members but also to other organizations responsible for relaying information, hence the presence of interagency collaboration.

In promoting disaster-resilient communities, the stakeholders must perceive disasters as complex problems requiring cooperation between the government, civil society researchers, and the community to share their resources, reduce social and researchers vulnerabilities, and utilize the informal network to minimize the impacts of such disasters (Edwards as cited in Kapucu & Demiroz, 2017). When complex situations occur, interagency collaboration is needed because it allows key actors to identify the problem and its scale, the best organizational mix that is necessary in responding to a crisis, identify lead agencies and efficient command and control, and maximize limited resources (Carmody, 2008). Therefore, the level of interagency collaboration is essential in the information exchange at the agency and community levels.

While many have recognized the importance of information during disasters, only a few organizations have attempted to study the dynamics of information exchange and the actors involved in the communication network as evidenced by the dearth of literature. To name a few, Girard (2016) studied how individuals usually seek information during disaster situations in various disaster events including the typhoons Haiyan and Hagupit in the Philippines. Alcayna et al. (2016), on the other hand, emphasized the need to map out the network and activities of both national and international agencies, which include the actors that work on resilience and disaster preparedness. Jovita et al. (2018) also evaluated the network structure of the Philippine disaster management and how it affects the country's disaster governance using social network analysis. By dissecting the flow of information exchange, we can identify not only the actors involved and their relationships, but also its crucial elements such as information needs, type of information, and channels of information, which are all useful in appraising information exchange failures (Steelman et al., 2012).

Accordingly, this study aimed to identify the characteristics of communication networks at the interorganizational level and the models that

arise during disaster response for Typhoon Nina in Sorsogon City, Philippines. By generating a visual map of the network, the authors explored the different components of the network, the actors present and the channels through which the information was conveyed, and their interaction in the information exchange. The central suppliers and consumers of information, the information exchange failures, and the challenges encountered by the key actors can also be analyzed from the resulting network. As for the effectiveness of the information exchange, three criteria were used, namely, adequacy, timeliness, and trustworthiness of the information.

The study of information exchange in a communication network during a disaster response is a crucial part of the overall disaster management of the country as it examines the possible failures, bottlenecks, and information asymmetry that may serve as a tipping point for public administrators to improve their policies.

Review of Related Literature

Disaster response, as one of the four mutually reinforcing thematic areas of the National Disaster Risk Reduction and Management Plan (NDRRMP)[1] of the Philippines, aims to establish institutional mechanisms for disaster response operations; improve the skills of individuals responsible in the search, rescue, and retrieval operations; provide actions in preserving life; and meet the necessary provisions of the affected population during or immediately after a disaster.

One of the critical actions that are considered to vouch a well-established disaster response operation is the availability of a timely, accurate, and reliable information that can be realized through an organized system of information gathering, reporting, and dissemination. The assessment of the situation may also be carried out through the damage assessment and needs analysis.[2]

The presence of communication is foundational in the four phases of disaster management: preparedness, response, prevention and mitigation, and rehabilitation and recovery. Communication is much needed during the disaster response as it bridges the affected individuals, families, and communities with their family members and first responders' support systems (Bullock, Haddow, & Coppola, 2013). In addition, prompt and efficient transmission of emergency information across the different actors during a disaster is critical to mitigate property loss and death (Clerveaux, Katada, & Hosoi, 2008).

Communication and information needs in a highly complex environment are often diverse, unpredictable, and ever-changing with respect to its scope, urgency, and information type, making them a recurring challenge for the authorities during disasters (Kapucu as cited in Steelman et al., 2012). With its elaborate processes consisting of various actors and unusual information

systems, establishing a response network between self-governing agencies is essential to warrant a more strategic and efficient way of sharing information.

According to Shekhar and Saxena (2012), to better understand the information systems for disaster response, there is a need to develop information management roles and dynamic capability to improve adaptivity. This involves the ability of organizations to assume a set of responsibilities within the structure of the system and to respond to the changing environment in an efficient manner. Since processes in the information exchange can be disrupted during disaster response, the flow of information from one organization or actor to the other can be hampered, leading to bottlenecks and asymmetry in the information.

One of the tools used to study the connections and relationships that arise between actors in a certain network is the social network analysis or SNA (Jamali & Abolhassani, 2006; Jones & Faas, 2017; Roberts, 2006). SNA has the ability to measure the effectiveness of disaster response, recovery, and adaptation due to its community competence—a typology used to describe a network that pays close attention to the significant roles of community while also putting sensitivity to the support information networks that arise (Jones & Faas, 2017).

In using SNA as a tool for disaster and humanitarian studies, it is important to determine at which level the actors will be analyzed as they can be examined at the individual (egocentric) or organizational (sociocentric) level (Bisri, 2016). As the name suggests, the egocentric level focuses on the individual actors who are reached, missed, and at risk of the impact of disasters, while the sociocentric analyzes interorganizational cooperation, patterns of interactions, types of network that exist in the interorganizational network, and how these networks organize in accomplishing their goals (Bisri, 2016; Haines, Hurlbert, & Beggs, 1996; Kapucu, Hu, & Khosa as cited in Kapucu & Demiroz, 2017; Roberts, 2006; Varda, 2017).

At the sociocentric level, the collaboration between organizations in disaster response can offer an avenue to look into the ties forged by the key organizations (i.e., government, private entities, and civil society groups) in terms of sharing information, mobilizing resources, and developing mutual understanding to ensure an effective disaster management (Kapucu & Demiroz, 2017; McGuire & Silvia, 2010). It should be noted that building partnerships among other organizations and individuals as part of establishing a sturdy interorganizational network does not constitute having a direct influence on the network. Instead, it should be viewed as a flexible arrangement in which it creates a platform for social, environment, technological change, and a cooperative form of environmental governance (Broto et al., 2015).

Recognizing the unpredictability of communication during disaster response, numerous theories and models from different disciplines have been

explored to analyze the role of communication networks in disaster management (Hayashi, Preece, & Shaw, 2014). Steelman et al. (2012) developed the infocentric approach, an economics-based method in which the information is treated as a good being exchanged by actors (i.e., customers and producers). Two major assumptions were theorized in this approach: first, information is not monolithic, which means multiple types of information are demanded and sought after by the actors; and second, the information needs of responders vary depending on their functions and roles during disasters. The problems in the communication network of information exchange were hypothesized to arise because of information asymmetry.

The five steps involved in the information analysis are as follows: (1) establishing the boundaries of the network; (2) identifying information markets; (3) assessing the channels used for information exchange; (4) mapping the network structure; and (5) diagnosing for information failures.

The actors in disaster management form part of the economic exchange where the types and levels of information vary depending on their capacities to obtain such information, thereby affecting their level of decisionmaking. Infocentric analysis differs from the SNA as it does not only document and map out the model of information-sharing, but also highlights the network of suppliers and consumers for certain types of information that puts weight on the content and quality of information.

While information-sharing becomes more dysfunctional during disasters, this is attributed to the difference in the level of knowledge of the sender and receiver that somehow form boundaries between those who share similar functions and understanding of information. Furthermore, Kapucu (2006) suggests that to address the complicated exchange of information, organizations must "develop and maintain effective partnerships" (p. 212) with different sectors and organizations.

As mentioned earlier, Girard (2016) used the case study of the Philippines during disaster response to briefly assess how information is relayed from the national government to the local communities. However, his study delved more into the information needs and information sources of the households that influenced their actions during disaster. These areas of information have been observed to be the prevailing subject of researchers in studying communication exchanges during disaster.

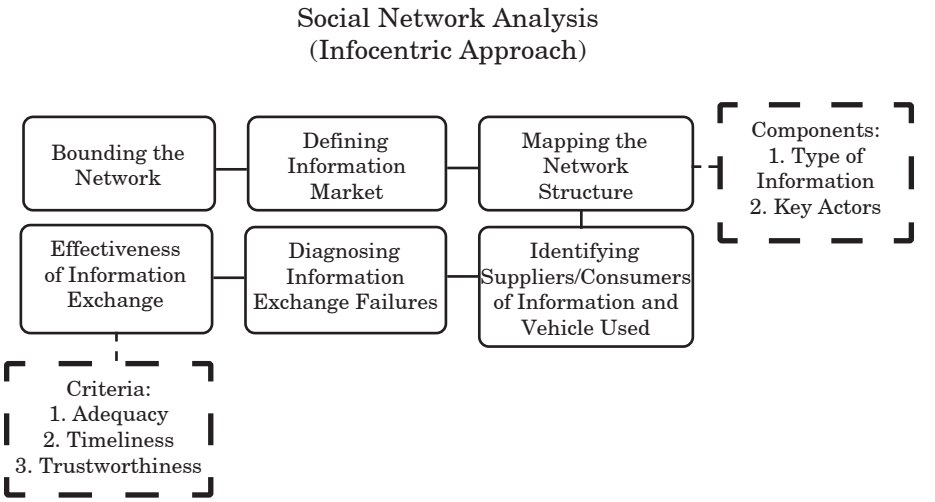
While the study of Jovita et al. (2018) attempted to explore the information exchange among local government agencies, it focused more on the standard operating procedures, rather than how these actors actually interacted during a disaster response situation. With the scarcity of such researches, the authors were propelled to investigate how agencies in the local government

interact among each other and with relevant nongovernment and civil society organizations during disaster response.

Methodology and Framework

This study adopted the infocentric approach of Steelman et al. (2012) as the framework for the SNA and the basis for analyzing the information exchange during disaster response for Typhoon Nina in Sorsogon City, Philippines (see Figure 1).

Figure 1. Steelman's Infocentric Analysis Process



Source: Steelman et al., 2012, p. 713.

Through this approach, the authors managed to bound the network of all the key actors that was derived from the official list of members of the City Disaster Risk Reduction and Management Council (CDRRMC)[3] in Sorsogon City. The types of information demanded by each actor were also clustered to gain an overview of the information markets. Using the UCINET 6 software, the communication network was visually mapped out to reveal the relationship patterns of the actors and to identify the central suppliers and consumers of information, along with its vehicles. The presence of information exchange failures was also diagnosed by looking into the phases of the network where the information was lost or where the other actors were unaware of the information that they should be demanding from or supplying to other actors.

The effectiveness of information exchange was measured based on the following indicators as prescribed by Steelman et al. (2012): (1) adequacy in meeting consumer's need, (2) timeliness, and (3) trustworthiness of information. Using a five-point Likert scale, the respondents were asked to list down their top five information needs along with their suppliers and modalities, and about their perception on information received based on three criteria. The effectiveness of information was further visualized in the map through the thickness of the network ties between the actors.

Considered as the strongest typhoon to hit the Bicol Region in 10 years, Typhoon Nina has been historic not only for causing major agricultural and infrastructure damages, but also for making landfall on the Philippines on Christmas Day, 25 December 2016—an occasion widely celebrated in the country. While there were few casualties during the typhoon, the local authorities admitted that they had trouble convincing the residents to evacuate as they all wanted to celebrate Christmas in their own homes (Ostria, 2016). The said typhoon, then severe tropical storm with international name Nock-Ten, entered the Philippine Area of Responsibility (PAR) on 23 December 2016. It intensified into a typhoon on 24 December 2016 and traversed to different regions in the country, primarily Bicol and Southern Luzon between 25 and 26 December 2016. It exited the PAR on 27 December 2016 and all tropical cyclone warning signals (TCWS) were subsequently lifted.

Among the areas in Bicol that were hit by the typhoon, Sorsogon City in Sorsogon Province had the highest number of affected population and one of the few areas to have experienced power outages. With its geographical location on the southernmost tip of Bicol Peninsula and eastern side of the Philippines, Sorsogon has a very high risk of experiencing typhoons (Center for Environmental Geomatics - Manila Observatory, 2005). Despite these geographical constraints, Sorsogon City has managed to be a hallmark of excellence in disaster preparedness and social protection as evidenced by the Seal of Good Local Governance,[4] which the LGU has consistently received since 2015. The zero fatality and few infrastructure damages that it sustained during Typhoon Nina also reflect the continued efforts of the city to strengthen its response measures and coordination during calamities.

To obtain the data, a survey questionnaire was administered to key members of CDRRMC in Sorsogon City, which was the locus of the study at the interorganizational level. The survey was designed to mirror all the information relevant for mapping the network in the disaster response for Typhoon Nina as illustrated in the infocentric approach. To ensure that the respondents have higher level of knowledge of the organizations they represent, the survey was administered to those who assume lead or senior positions and were particularly involved during the disaster response for Typhoon Nina.

Since a snowball sampling approach was used in bounding the networks, the sample size was dependent on the number of actors identified by the respondents as those they interacted with. However, to minimize the possible recall error and biases of the respondents while recalling the incident, a multi-grid format containing all the CDRRMC members was used in the survey, including an open-ended question to incorporate the other actors not mentioned on the list. Out of 38 network actors who were identified to have leadership roles in relation to DRRM, the authors were only able to gather responses from 27 actors.

SNA Measures

The terms "node" and "actor" are used interchangeably in this study. An *actor* is any unit, organization, or agency that carries out a set of functions in relation to disaster response for Typhoon Nina. Meanwhile, *centrality* is defined as the structural importance of one node in a network (Borgatti, Everett, & Johnson, 2013). Hence, a node is deemed important if it has a strong number of ties in the network. In the context of information exchange, the centrality of the node suggests that an actor representing it is in control of the information network (i.e., filtering, designing, passing on the information to other network actors, etc.). This may also imply that a central actor must have captured the information earlier before relaying it to other actors for their decisionmaking.

As mentioned earlier, the UCINET software was used to compute the *degree centrality* of the nodes/actors in the network for each type of information ties, namely, information seeking and information provision.

Degree Centrality for Directed Matrices

Degree centrality is the measure used by the authors to compute the ties that a node for each network has. The values of the individual nodes were also computed using this function: *UCINET network>centrality>degree*. For the directed (asymmetric) matrices where the relational phenomena of the nodes have a sense of direction, the *outdegree* (i.e., the number of outgoing ties from a node) and *indegree* (i.e., incoming links/ties of predecessor nodes) values were computed. This matrix was applied to the networks of information seeking and information provision.

Betweenness Measures for Information Exchange Ties

Betweenness centrality measures the degree of control that a node has for each network. Freeman (1979) defined betweenness as a measure of how often a given node falls along the shortest path between two other nodes. To get the proportions, each pair of nodes other than the focal node is divided by the shortest path (i.e., from one node to another) that passes through that node. Then, the values are summed up to get the betweenness centrality measure of one node.

If the value of betweenness of a node is zero, it means that it is an isolated node (i.e., it has no connections or that every node in the network is connected to every other alter). Betweenness is equated to control, hence, the higher its value the higher the tendency of that node to control information flows. The nodes with high betweenness are also in the best position to filter, distort, or alter the information as they pass it along. If these nodes are removed from the network, it may result in paralysis of information flow. In an emergency context, the removal of such nodes in the network may lead to delays in the decisionmaking, delivery of services, and coordination among agencies.

Results and Discussion

Infocentric Approach of Disaster Response for Typhoon Nina

Bounding the Network

The CDRRMC of Sorsogon City is composed of 38 members: 27 government agencies, seven nongovernment organizations (NGOs), and four private entities (see Tables 1 and 2). This served as the basis of the authors for bounding the network of official key actors in disaster response.

Table 1. Profile of Key Actors in the CDRRMC

Org. Type	Actors	Actual	Turnout (%)
Government	27	19	70.37
NGO	7	5	71.43
Private	4	3	75
Total	38	27	71.05

Due to the unavailability of some respondents who assumed leadership roles during the response for Typhoon Nina, the authors were only able to obtain 27 responses, which constitute a 71% turnout. With the missing data, the centrality measures may erroneously assume non-ties for actors who did not participate in the survey, which is not necessarily true. As a measure to address this, the authors devised a mechanism for non-symmetric matrices.

Since this study is limited to the network ties for information seeking and provision, which fall under the non-symmetric or director matrix, the data obtained for the two matrices were assumed to be complements of one another by transposing the data from the second matrix to fill-in the missing rows in the first and vice-versa (Borgatti et al., 2013).

Table 2. Key Actors of CDRRMC

Government agencies	1. City Mayor's Office (CMO)	12. City Public Information Office (CPIO)	23. Gender and Development Unit (GADU)*
	2. City Planning and Development Office (CPDO)	13. Bureau of Fire Protection (BFP)	24. Sangguniang Panlungsod Committee on Peace and Order (SP-CPO)*
	3. City Disaster Risk Reduction and Management Office (CDRRMO)	14. Department of the Interior and Local Government (DILG)	25. Sangguniang Panlungsod Committee on Environment (SP-CE)*
	4. City Social Welfare and Development Office (CSWDO)	15. National Food Authority (NFA) Field Office	26. Department of Health (DOH) Field Office*
	5. City Agricultural Services Office (CASO)	16. Philippine Coast Guard (PCG)	27. Department of Science and Technology (DOST V)*
	6. City Veterinary Office (CVO)	17. Association of Barangay Captains (ABC)	28. Philippine Atmospheric Geophysical and Astronomical Services Administration (PAGASA) Field Office**
	7. City Budget Office (CBO)	18. Department of Education (DepEd)	29. Department of Social Welfare and Development (DSWD) Field Office**
	8. City Administrator's Office (CAO)	19. Philippine National Police (PNP)	30. Department of Public Works and Highways (DPWH) Field Office**
	9. City Environment and Natural Resources Office	20. City Health Office (CHO)*	
	10. City General Services Office (CGSO)	21. City Engineering Office (CEO)*	
	11. City Treasurer's Office (CTO)	22. Philippine Army (PA)*	
NGOs	1. Bicol Emergency Response Team (BERT)	4. Philippine Red Cross (PRC)	7. Coastal Core*
	2. KABALIKAT	5. Sorsogon Social Action Foundation	
	3. Kapisanan ng mga Brodkaster ng Pilipinas - Sorsogon (KBP-SOR)	6. Green Valley Development Program (GVDP)*	

Private organizations	1. Sorsogon City Water District (SCWD)	3. Sorsogon Electric Cooperative	5. Wholesalers/Retailers**
	2. Philippine Chamber of Commerce - Sorsogon (PCC-SOR)	4. Filipino-Chinese Chamber of Commerce (FIL-CHIN)*	

*Note: * Actors that did not participate in the actual SNA survey*
*** Actors that were not included in the list but emerged in the network*

Defining the Information Markets

In substantiating the information market, the respondents were asked to identify their top five information needs for disaster response and the actors to whom they obtained the information. The resulting responses were then grouped according to the Operation Listo Checklist.[5]

The six information clusters derived from the checklist, along with the information needs, are

1) *directive and status reports*–cancellation of flights, land, and sea travels, pre-disaster assessment, typhoon status, power supply (outages), water supply (shortages), and cancellation of classes;

2) *meeting*–incident command team, coordination meeting, and LDRRMC meeting;

3) *resources and status availability*–rice availability in the market, inventory of relief goods, and availability of equipment, vehicles, and classrooms;

4) *highly vulnerable communities*–areas of flooding and landslides, and road closures;

5) *evacuation*–evacuation centers, camp engagements, mass feeding distribution, and preemptive evacuation; and

6) *deployment of clusters*–medical response team, and relief goods and services operations.

The obtained responses were then converted into a dataset through *UCINET>network> centrality* function. This function calculates the degree and the normalized degree centrality of each node. Hence, the higher the outdegree centrality, the more a node is considered a central consumer of information. On the other hand, the higher the indegree centrality, the more a node becomes a central supplier of information. The values derived from this function were also used to rank and identify the central consumers and suppliers of information for each type of information market.

Mapping the Network Structure

Using the UCINET software, the structure and interactions of the key actors in the network were visually mapped out. In this study, the matrices of the communication network were focused only on information seeking and provision.

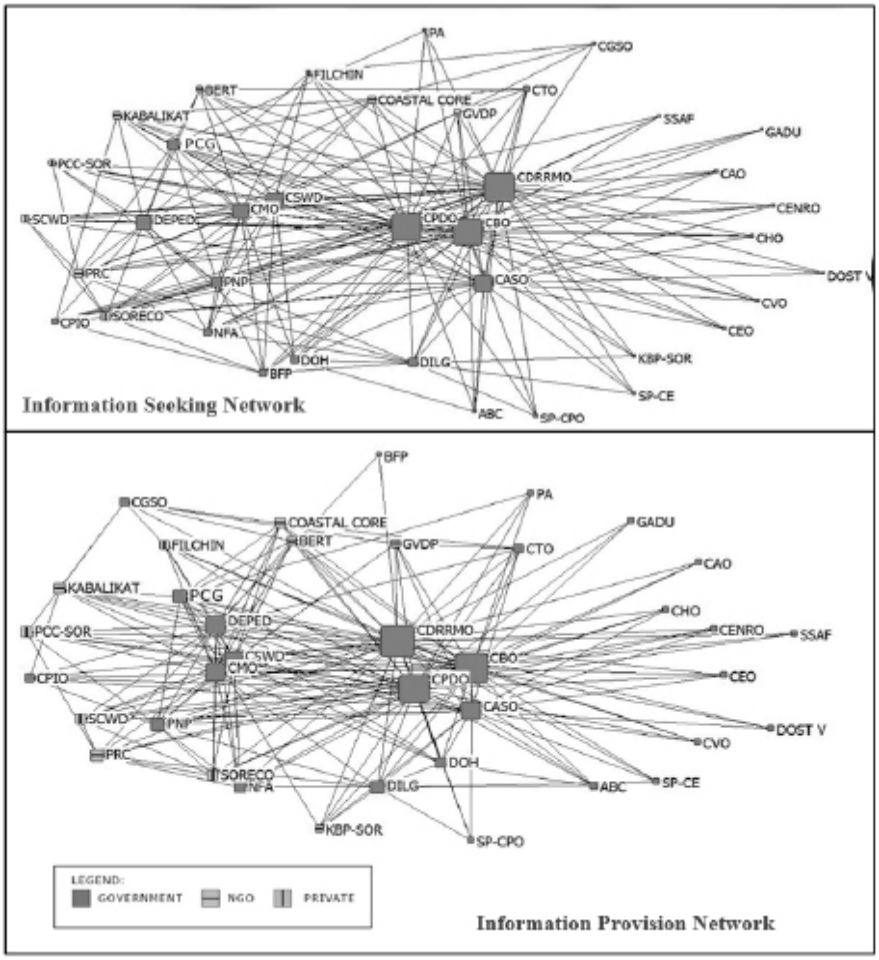
For the information seeking network, the key actors were asked to identify the other actors from whom they sought information during the disaster response. Figure 2 depicts the visual representation of the network where the indegree nodes (inbound links) indicate that the actors connected to it are identified by others as their primary source of information while the outdegree nodes (outbound links) indicate that the actors who identify several suppliers are considered primary consumers in the network.

To complement and validate the exchange of information between the actors who actually supplied and consumed information, the respondents were asked to identify other actors to whom they have provided information. The obtained data were then mapped out to visualize the network for the information provision (see Figure 2). In this network, the definitions of indegree and outdegree nodes have been interchanged, hence, the indegree indicates the actors who have been supplied with information while the outdegree indicates the actors who have supplied that information.

The indegree and outdegree values for both networks were generated and compared as shown in Table 3. The network reveals that City Disaster Risk Reduction and Management Office (CDRRMO) as being both the primary supplier in the information seeking (indegree) and information provision (outdegree). It also shows that City Budget Office (CBO) and City Planning and Development Office (CPDO), along with CDRRMO, are the top three for both networks, which means that they play significant roles in accumulating and dispensing information relevant to disaster response. CBO was mentioned by other actors to be responsible for generating information concerning the status of the budget and emergency, and calamity funds as well as the availability of other resources. CPDO, on the other hand, was the lead agency for supplying information relating to the development plans and policies of the City Government.

Among the types of actors in the network, it can be observed that those in the government have established more interactions than NGOs and the private sector, as evidenced by the nodes connected to them. Consequently, the agencies within the internal unit of the City Hall of Sorsogon have emerged to be the primary suppliers and consumers of information.

Figure 2. SNA Map for Information Seeking (above) and Information Provision (below)



The average degree of centrality for the information seeking and provision networks are 7.263 and 7.237, respectively, which means that the actors are connected to about 19% of the nodes in the network. While the exchanges of the actors are relatively low, the variability of its outdegree and indegree centrality for both networks reveals that there is one node dominating the entire network. This finding suggests that the power of individual actors may vary and that some actors may be positioned more advantageously than the others in terms of seeking and providing information.

The network also shows that there are some actors who are identified as the least central consumers of the information such as Bureau of Fire Protection

(BFP), Sorsogon City Water District (SCWD), City Veterinary Office (CVO), City Environment and Natural Resources Office (CENRO), Association of Barangay Captains (ABC), City General Services Office (CGSO), and City Administrator's Office (CAO), among others. Their low centrality can be attributed to the proposition that these actors already have an existing tie with a highly central supplier like CDRRMO, which may be expected to have acquired all their information needs for disaster response.

Table 3. List of Actors in the Information Seeking and Provision Network

Information Seeking						Information Provision					
Actors	Indegree (Supplier)	Rank	Actor	Outdegree (Consumer)	Rank	Actor	Outdegree (Supplier)	Rank	Actor	Indegree (Consumer)	Rank
CDRRMO	37	1	CBO	37	1	CDRRMO	37	1		34	1
CBO	14	2	CPDO	35	2	CBO	36	1	CBO	14	2
CPDO	14	2	CDRRMO	29	3	CPDO	35	3	CPDO	13	3
SORECO	11	4	CASO	20	4	CASO	20	4	DepEd	12	4
PNP	11	4	CSWD	16	5	CSWD	16	5	PNP	11	5
PCG	11	4	CMO	15	6	CMO	16	5	PCG	11	5
CMO	10	7	DepEd	13	7	DepEd	13	7	CMO	10	7
KAB-ALIKAT	9	8	DOH Field Office	9	8	DILG	11	8	SORECO	9	8
DepEd	9	8	Coastal Core	6	9	DOH Field Office	8	9	DOH Field Office	9	8
PRC	9	8	GVDP	8	9	Coastal Core	8	9	PRC	9	8
CSWD	9	8				PCG	7	11	KAB-ALIKAT	9	8

Identifying Suppliers and Consumers of Information and the Vehicles Used

By computing the cumulative outdegree and indegree centrality of all the information markets, the authors were able to identify the overall central consumers and suppliers of information for disaster response.

The network reveals that CDRRMO is the central consumer and supplier for most of the information markets (see Table 3). With its high degree centrality, CDRRMO was at the vantage point of influencing the flow of information and directing the entire network, thus acting as a gatekeeper of information. The City Mayor's Office (CMO) also acted as the central supplier of information, which is evident in its mandate as the lead agency in implementing emergency measures of LGUs during and after disasters. The ABC also emerged as a primary supplier of information. Through its president, ABC played a critical role in re-echoing

the information needs of all the barangays to the council and stakeholders. In addition, it provides first-hand information on the status reports of the barangays.

Meanwhile, law enforcement entities such as Philippine National Police (PNP) and Philippine Coast Guard (PCG) are considered central information seekers as they sought vital information on the status reports of: road closures, preemptive evacuation, and travel authorities on land and in water. These types of information needs are critical for the agencies to carry out their functions as first responders and to ensure the immediate safety of the public. While Philippine Atmospheric Geophysical and Astronomical Services Administration (PAGASA) Field Office was not included in the list provided by CDRRMC, it emerged in the network as a supplier of information by providing weather forecasts, bulletins, and situation reports to other actors.

Table 4. List of Central Suppliers and Consumers

Central Consumer			Central Supplier		
Actors	Outdegree Centrality	Rank	Actors	Indegree Centrality	Rank
CDRRMO	12	1	CDRRMO	33	1
CGSO	10	2	CMO	18	2
NFA Field Office	8	3	ABC	16	3
CENRO	8	3	CSWD	14	4
CSWD	6	5	PAGASA Field	12	5
PCG	6	5			
PNP	6	5			
BFP	6	5			
CTO	6	5			

As shown in Table 4, the central consumers of information are all government agencies. This suggests that actors in the government being the key responders for the typhoon have been equipped with the information and knowledge necessary for their decisionmaking and actions.

Information Markets: Central Suppliers and Consumers

Using the outdegree and indegree centralities of the actors, the central suppliers and consumers were generated for each information market (see Table 5). The actors were determined based on the markets where they garnered the top three highest centrality scores.

It can be observed that while the majority of the central suppliers and consumers are from government agencies, there is a considerable number of actors from the private sector and NGOs, as well as those not included in the official

list, that emerged in the information markets. This includes Sorsogon Electric Cooperative (SORECO), which acted as a central supplier and consumer of information for directives and status reports. As the electric power distributor of Sorsogon Province, SORECO plays a critical role in capturing and disseminating information relevant to the status of electricity (i.e., service interruption and power outages) in the area.

Table 5. Network Supplier and Consumer Centrality in the Information Markets

	Information Market					
	Directives and Status Reports	**Meetings**	**Resources Availability**	**Highly Vulnerable Communities**	**Evacuation Standards**	**Deployment of Clusters**
Central Consumers	CDRRMO, CGSO, CSWD, SORECO	CBO, CASO, SSAF	NFA Field Office, CTO, CAO, PNP, PCC-SOR	PCG, BFP	DepEd, CENRO, BERT, CTO, CVO, CPDO, CPIO, CGSO, CMO, CDRRMO, CASO	CDRRMO, PNP, CTO, CPDO
Central Suppliers	CDRRMO, PAGASA Field Office, CMO, ABC, SORECO, KBP-SOR	CDRRMO, CBO	CSWD, CMO, CEO, CDRRMO, PA, Wholesalers/ Retailers, DSWD Field Office, DPWH Field Office	CDRRMO, DILG, PAGASA Field Office	ABC, CDRRMO, CSWD, CDRRMO, DepEd, CMO, DOH Field Office	CMO, CEO, NFA Field Office, ABC, DPWH Field Office, DSWD Field Office

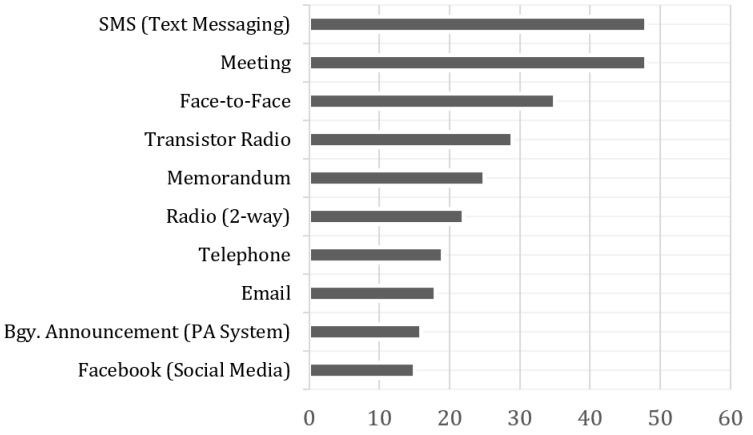
It is worth mentioning that wholesalers and retailers emerged in the central suppliers of information for resource availability, which suggests that they are keepers of information relating to the status of goods and commodities. The Philippine Chamber of Commerce – Sorsogon (PCC-SOR) acted as a central consumer for the same market. This implies that the information PCC-SOR demands is critical in gauging its collaboration and resource-sharing initiatives during disasters.

Lastly, the field offices of Department of Public Works and Highways (DPWH) and Department of Social Welfare and Development (DSWD), which were not included in the list, also emerged as central suppliers of information. As the executive arm of the national government, these agencies serve as key partners in harmonizing the response efforts of the local and national government.

Vehicles of Information

The widely utilized vehicles of information for all organizations during disaster response were SMS (text messaging) and meetings as illustrated in Figure 3. A primary component of mobile device systems, SMS is evidently one of the convenient and handy options for actors in exchanging information. Coordination meetings with the LDRRMC were also part of the modalities through which the members convene to set the direction and implementation of disaster response activities. Face-to-face conversations with other key actors are the next most commonly used vehicle of information. The following channels were occasionally or seldomly utilized by the actors during their response efforts for Typhoon Nina: transistor radio, memoranda, two-way radio, telephone, emails, public announcement systems, and Facebook (social media platforms).

Figure 3. Vehicles/Channels of Information



The frequency of the usage of these vehicles of information may be attributed to their level of accessibility and promptness of delivering information to intended recipients. Hence, the quicker the information is disseminated and received, the more it is used by the actors. Emergency information disseminated through text messaging tends to be highly perceptible due to its reach and reliability especially to the sender and receiver of information outside the City Government of Sorsogon (i.e., NGOs and private sector). Consequently, meetings were also among the highest vehicles of information. It was during the CDRRMC meetings where the exchange of information happened. While face-to-face is also ideal, this may only be limited to actors working within the vicinity of the City Hall where physical interaction is highly expected. On the other hand, barangay announcements (public announcement system) and Facebook (social media) were the least utilized vehicles of information since

these were used to disseminate information to the community level and not to the organizational level, which was the target of the survey.

Diagnosing Information Exchange Failures (Betweenness)

Information exchange failures exist if there are actors in the network who are unaware of the information that they should be demanding from or supplying to others. Using this premise, the authors looked into the interaction patterns of actors regarded by many as their primary supplier of information but have provided information to only a few actors. Those who identified themselves as primary consumers but have received few information were also included in this analysis.

By revisiting the networks of information seeking and provision, it is observed that there are several actors like SORECO, PNP, KABALIKAT, and Philippine Red Cross (PRC) which appeared to be unaware of the actors demanding information from them. Before we affirm the presence of such asymmetry, it is important to distinguish their most common consumers as they might serve as intermediaries in bridging the information to other actors. In this case, Department of Education (DepEd), City Social Welfare and Development Office (CSWDO), CBO, CPDWO, CDRRMO, and CMO, which are all government agencies, emerged to be their primary consumers of information. As presented in Table 5, these actors were also the central suppliers to various types of information. Majority of the other actors that demanded information from SORECO, PNP, KABALIKAT, and PRC are situated within the vicinity of the City Hall. This may suggest that the central suppliers of information like CDRRMO and CMO may have served as intermediaries in dispensing information to others.

As for the consumer-level of information exchange failure, those identified by others as their information suppliers were found to be of diverse composition in terms of the information they provide and their types of organizations. In the case of CSWDO, it identified BFP, Bicol Emergency Response Team (BERT), National Food Authority (NFA) Field Office, CDRRMO, Green Valley Development Program (GVDP), PRC, and PCG as its primary suppliers of informations. City Agricultural Services Office (CASO), on the other hand, identified NFA Field Office, SORECO, PNP, CVO, and CENRO, among others, as its primary suppliers of information. While this failure may also be viewed from the perspective of an intermediary actor, the list of the information suppliers may indicate that these actors, which are diverse in nature, may not be fully aware of the other actors who utilize information from them.

To ascertain the presence of information exchange failure for both the consumer and supplier levels, the betweenness centrality of the nodes were evaluated using the *UCINET network >centrality>betweenness> nodes* function (see Table 6). As discussed earlier, betweenness measures the degree of control

that a node has for each network and how it acts as a bridge between other nodes. It reveals that CDRRMO has the highest betweenness among all the actors, thus, a gatekeeper of information in the network. As such, it is regarded to have a strong influence within the network by virtue of its control over the information that passes through it. With such authority over the network, CDRRMO must recognize its crucial role in bridging information from one actor to the other as any slight mishap in the information exchange may lead to the distortion of communications between other actors. As shown in Table 6, the betweenness values of CDRRMO deviate remarkably from the other nodes next to it. Apart from being a gatekeeper, its high betweenness can be attributed to its vital role as the lead agency not only in disaster response, but also for the DRRM activities at the local level. It can also be observed that CBO and CPDO were ranked respectively next to CDRRMO, suggesting that they also play an important role especially in the mobilization of resources and development plans for the response operations of the LGU.

The strong influence of the CDRRMO over the network, by being the central supplier and consumer of information, may also be found in similar studies where the state of emergency operations centers maintained control over the collection and dissemination of disaster information (Militello, Patterson, & Wears, 2007; Peng & Wu, 2018). According to Militello et al. (2007), information generally flows directly from the community to a core team, which in this case is the CDRRMO. In theory, information must flow outward from the core to the other actors. However, there is a tendency for the information to get fragmented as it flows due to the volume of information present inside and outside the core team. In addition, the need for immediate decisionmaking of the core team hampers its ability to delegate tasks that often leads to the disoriented situation awareness of the actors outside the team (Militello et al., 2007)

As recommended by Militello et al., these issues in the information flow may be addressed by providing opportunities to all actors to interact and be familiarized with the roles and responsibilities of each actor. Another way to measure its effectiveness is to characterize the network and look if it has a highly centralized network with a lead actor, but has a low density (Raab et al., 2013 as cited in Jovita et al., 2018). In the case of Sorsogon City, it shows that while the CDRRMO has a high betweenness and control over the network, it still managed to take the lead role in responding to disasters. Given the steps undertaken by the rest of the actors, it also reveals that CDRRMC has established the roles and responsibilities of each actor within the council, thereby, providing a situation awareness to all the members and ensuring that the protocols were set in times of the disaster.

Table 6. Betweenness Centrality of Actors for Information Seeking and Provision Networks

Information Seeking			Information Provision		
Organization	**Betweenness**	**nBetweenness**	**Organization**	**Betweenness**	**nBetweenness**
CDRRMO	728.05	54.66	CDRRMO	717.41	53.86
CBO	205.22	15.41	CBO	143.43	10.77
CPDO	170.39	12.79	CPDO	102.59	7.702
CMO	24.295	1.824	DepEd	28.265	2.122
DOH Field Office	22.855	1.716	CMO	26.643	2.00
CASO	20.94	1.572	PCG	13.279	0.997
Coastal Core	19.412	1.457	CASO	12.411	0.932
PCG	19.198	1.441	DOH Field Office	12.142	0.912
CSWD	15.362	1.153	CSWD	10.176	0.764
GVDP	11.283	0.847	Coastal Core	8.767	0.658
DepEd	10.6	0.796	DILG	7.577	0.569

Effectiveness of Information Exchange

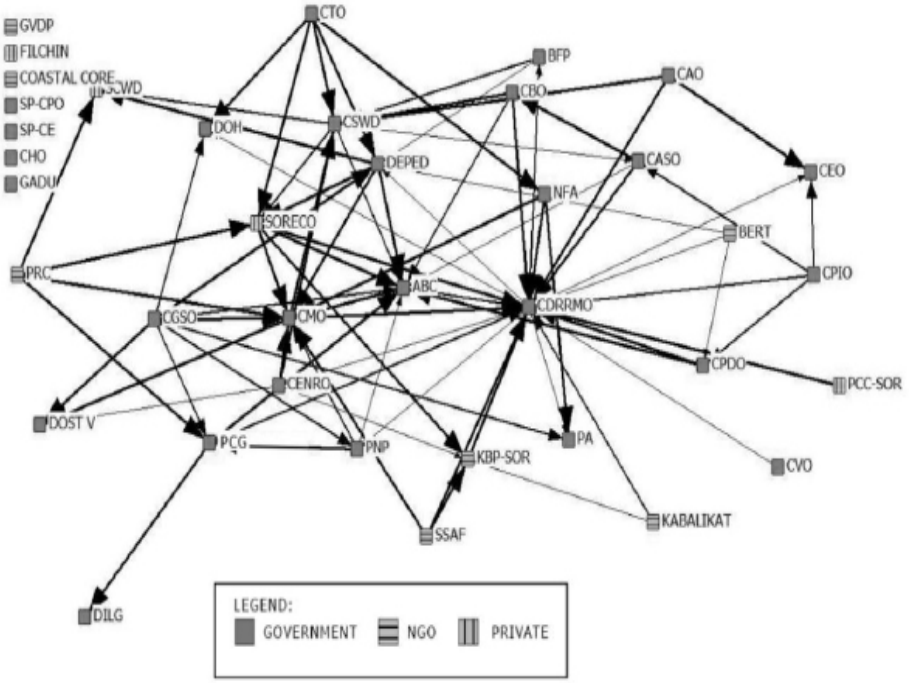
As defined in the infocentric analysis of Steelman et al. (2012), information is effective if it holds the three criteria as perceived by the consumer: adequacy, timeliness, and trustworthiness. Adequacy means that there is no missing information and that it is sufficient to make a decision or action while timeliness entails that the information arrived when consumers needed it with no delays. Trustworthiness, on the other hand, means that the information is credible and valid for the actor to make an informed decision.

The respondents were asked to list down their top five information needs and the actors that supplied it, along with its modalities. They were consequently asked to rate how much they agree with the following statements using a five-point Likert scale: (1)*"The information I received is adequate*;" (2) *"The information I received arrived on time for decision making and for other use of the information;" and (3) "The information I received is credible."*

The resulting scores were then computed by getting the average of the adequacy, timeliness, and trustworthiness scores. The values were also applied in the datasets using the *transform>matrix operations>between datasets>statistical analysis>sum* function. The overall matrix was then plotted to compare the scores of each actor (see Figure 4).

The tie strengths between actors are signified by the thickness of the strokes while the direction of the arrow shows where the information supplier is. Those lines with thicker strokes suggest that the information flow between the actors is perceived by the consumer as more effective on the basis of its adequacy, timeliness, and trustworthiness.

Figure 4. SNA Map on the Effectiveness of Information Exchange



Based on the survey, 20 out of the 27 key actors were identified to have supplied the information needs of the respondents (see Table 7). Since a snowball approach was used in this analysis, only the 20 actors mentioned were evaluated by the respondents for their effectiveness.

It reveals that government agencies dominate in supplying information to the rest of the network (85%) while only a few organizations from the private (10%) and NGO (5%) emerged. This implies that actors from the government sector have been key sources of information during the disaster response for Typhoon Nina.

Table 7. Effectiveness Scores of Information Exchange

	Information Suppliers	Org. Type	Information Consumers	Total Score	Ave.	Norm. Values	Rank	Remarks
1	NFA Field Office	Govt.	CTO	5.00	5.00	5	1	E.E.
2	CSWD	Govt.	BFP, CTO, CBO, CENRO, CMO, CAO	29.00	4.83	4.66	2	E.E.
3	PCG	Govt.	PNP, PRC, CGSO	14.33	4.78	4.56	3	E.E.
4	DILG	Govt.	PCG	4.67	4.67	4.34	4	E.E.
5	CBO	Govt.	CASO	4.67	4.67	4.34	4	E.E.
6	SORECO	Private	DepEd, PRC, CTO, CSWD	18.67	4.67	4.34	6	E.E.
7	CMO	Govt.	DepEd, NFA Field Office, SORECO, PNP, PRC, ABC, CENRO, CGSO, SSAF	46.17	4.62	4.24	7	E.E.
8	SCWD	Private	DepEd, PRC, CSWD	13.67	4.56	4.12	8	E.E.
9	CDRRMO	Govt.	BFP, BERT, NFA Field Office, PCG, PCC-SOR, KABALIKAT, CBO, CVO, CPDO, CPIO, CENRO, CMO	74.61	4.39	3.78	9	V.E.
10	DOST V	Govt.	CENRO, CGSO, CMO	12.67	4.22	3.44	10	V.E.
11	ABC	Govt.	DepEd, SORECO, PNP, PCG, CBO, CPDO, CENRO, CSWD, CGSO, CDRRMO, CASO, CASO, KBP-SOR, SSAF, CAO	45.66	4.15	3.3	11	V.E.
12	DOH Field Office	Govt.	CTO, CGSO	12.33	4.11	3.22	12	V.E.
13	PA	Govt.	NFA Field Office, CGSO, KABALIKAT	12.33	4.11	3.22	12	V.E.
14	KBP-SOR	NGO	SORECO, KABALIKAT, CENRO, SSAF	15.67	3.92	2.84	14	M.E
15	CEO	Govt.	CPIO, CDRRMO, CAO	11.67	3.89	2.78	15	M.E

16	DepEd	Govt.	BFP, BERT,CTO, CGSO, CDRRMO	19.33	3.87	2.74	16	M.E
17	PNP	Govt.	CGSO, CDRRMO	7.33	3.67	2.34	17	M.E
18	CASO	Govt.	CPIO, CSWD	7.33	3.67	2.34	17	M.E
19	CPDO	Govt.	BERT, CPIO	7.00	3.50	2	19	S.E.
20	BFP	Govt.	CDRRMO	3.00	3.00	1	20	N.E.
Grand Average					4.21	3.43		V.E.

The table also highlights the following actors who have the greatest number of consumers, namely, CMO, CDRRMO, and ABC. The centrality of the said agencies in supplying information mirrors their active role in relaying information and serving as frontliners in the DRRM activities of LGUs. CDRRMO and CMO as both central suppliers and consumers of information can provide a bird's eye view of the events that took place during the disaster as they have more ties with the rest of the network. ABC, on the other hand, can serve as the primary channel for cascading information down to the community or barangay level.

The score range used for measuring the level of effectiveness are as follows:

- [≤ 1] Not Effective (N.E.)
- [1 ≤ 2] Slightly Effective (S.E.)
- [2 ≤ 3] Moderately Effective (M.E.)
- [3 ≤ 4] Very Effective (V.E.)
- [> 4] Extremely Effective (E.E.)

Due to the limited number of actors evaluated in the effectiveness level, the computed values were normalized to minimize data redundancy and anomalies. Based on the normalized result, the NFA Field Office garnered a perfect score rating for the information it supplied. As the agency responsible for food security across the country, NFA mainly coordinates on matters concerning the availability of rice, its inventory, and market price. Its strikingly high score implies that the information it provides to its consumer possesses the highest level of adequacy, timeliness, and trustworthiness. However, since City Treasurer's Office (CTO) was the only actor to have mentioned NFA Field Office, the effectiveness of information is limited to the perception of the former. The Kapisanan ng mga Brodkaster ng Pilipinas – Sorsogon (KBP-SOR), which is the only NGO to emerge in the network, obtains a moderately effective rating. Despite experiencing power interruptions across Sorsogon during the typhoon, KBP-SOR managed to carry out its function as a communication information broker by mobilizing its access to radio broadcasts and expanding its information dissemination to all the network members, as well as the public.

While BFP appears to be the only actor to have received a very low rating, the overall network reveals that the information market suppliers during the disaster response for Typhoon Nina have been effective in conveying the needed

information. However, since the survey was limited to five information needs, there are other actors who might have provided some information needs that were not mentioned and assessed by the respondents. Nonetheless, the satisfaction level of the respondents may give us perspective on the content and quality of the information they received that were pivotal in the decisionmaking of their organizations during the typhoon.

Conclusion

With the prevalence of natural disasters, analyzing the information exchange of key responders is essential to gain an overview of the relationship patterns that transpired between the actors and to gauge if the information needs are fulfilled as requisites for making informed decisions. Using SNA through the infocentric approach, the information exchange of various actors in the disaster response for Typhoon Nina was analyzed. By looking at the network ties for information seeking and provision, the key suppliers and consumers of information were identified. The different types of information needs were also grouped into distinct information markets where the suppliers and consumers were plotted.

The network reveals that government agencies have established stronger interactions in the network and served as central suppliers and consumers of information. While NGOs and private entities also contribute in the information sharing during the typhoon, it shows that they are reliant on government agencies with regard to the information needs for their response efforts. There are also other actors who emerged in the network but were not included in the official list of CDRRMC. This includes PAGASA, wholesalers/retailers, and other field offices of the national government. This may indicate that the information sharing of organizations is not confined within the official list of CDRRMC members. It transcends beyond the city-level of interaction depending on the type and nature of information that an actor needs.

The presence of information exchange failure was also observed in the network as manifested in the apparent mismatch of supply and demand of information among the actors. A few disjunctions were noticed especially to those who were identified to have supplied information and those who actually supplied the information. While these incongruities may also pose an information exchange failure, the presence of intermediary actors may have facilitated the transmission of information to those connected to their periphery.

By measuring the betweenness centrality of the networks, it was found that CDRRMO has the highest level of betweenness that makes it a gatekeeper of information for disaster response. The high degree of network centralization further corroborates the presence of an actor, which in this case is CDRRMO,

that dominates the network and has the leverage to accumulate and disseminate information to its members. Furthermore, using the adequacy, timeliness, and trustworthiness criteria, the information exchange for disaster response in Sorsogon City has been assessed to be generally effective as evidenced by the high level of satisfaction of the information receivers.

In the context of disaster response during Typhoon Nina, the effectiveness of information exchange reflects the prompt emergency measures of Sorsogon City as the key actors have been equipped with the right information necessary for their decisionmaking and for minimizing the impacts of the typhoon through proper coordination.

Recommendations

While the exchange of information among the network members is generally effective, the CDRRMO as the lead agency in DRRM should revisit and appraise the interactions established during the disaster response to ensure that each member receives the primary information necessary for their decisionmaking. Likewise, all the council members must be fully aware of the information that they should be providing or demanding, along with the members to whom they should be interacting with. Since many actors depend on CDRRMO to reach other nodes, it is imperative to build and expand its capacity to promptly and effectively bridge the information to other actors. As for those members identified as central suppliers and consumers of information, the technical capacities and competencies of their respective organizations should be enriched to facilitate an expedient exchange of information.

The analysis of the information exchange in a multi-organizational network confirmed the interdependence of various members of the council as evidenced by their reliance on information sharing. Recognizing the importance of lateral communication, disaster coordinators must establish stronger ties with other agencies especially NGOs and private entities as they are also key partners in effective information exchange. Moreover, the high centrality of the communication network may help identify the gaps between those actors who are highly connected to the network and those who are not. This would enable our key actors to devise an approach on how to strengthen the ties with its network members during disasters.

Endnotes

[1] The NDRRMP fulfills the requirement of Republic Act 10121 also known as Philippine Disaster Risk Reduction and Management (PDRRM) Act of 2010, which provides the legal basis for policies, plans, and programs to deal with disasters.

[2] The damage assessment and needs analysis is an assessment tool used by the local and national DRRMCs to consolidate, analyze, and disseminate data. The information in the DANA is supplied and used by various lead agencies, departments, and partner civil society organizations.

[3] The CDRRMC is the counterpart of Disaster Risk Reduction and Management Organizations at the provincial level. Some of its functions are to approve, monitor, and evaluate the implementation of the local disaster risk reduction and management plans and regularly review and test the plan consistent with other national and local planning programs.

[4] The Seal of Good Local Governance (SGLG) originated from the Seal of Good Housekeeping. The SGLG expands its core assessment areas from good financial housekeeping to include social protection and disaster preparedness. A symbol of integrity and good performance, SGLG encourages LGUs to continue good governance practices while providing better public services.

[5] The Operation Listo Checklist is a manual containing the minimum actions that LGUs must undertake before, during, and immediately after a typhoon. This was launched by the Department of the Interior and Local Government (DILG) as a step-by-step guide for LGUs in their disaster preparedness and response.

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Nissi Abigail J. Buenaobra works as a Technical Researcher at the Office of Civil Defense. She is currently a Juris Doctor student at the University of the Philippine College of Law. She graduated from the same university with a degree in Public Administration. She can be reached at njbuenaobra@up.edu.ph.

Aries P. Austria works as a Senior Administrative Assistant at the Office of the Governor, Provincial Government of Palawan. He finished his bachelor's degree in Public Administration at the University of the Philippines Diliman. He can be reached at ariespaustria@gmail.com.

Hannah Trisha J. Calucin works as a Political Affairs Officer at the Office of the Third District of Laguna Representative Sol Aragones. She obtained her bachelor's degree in Public Administration at the University of the Philippines Diliman.

Gianna C. Capacia works as a Budget and Management Analyst at the Department of Budget and Management. She obtained her bachelor's degree in Public Administration at the University of the Philippines Diliman.

Joel L. Dela Paz, Jr. works as a Planning Officer at the Policy Management, Coordination and, Advocacy Division of the Department of Information and Communications Technology. He obtained his Bachelor of Public Administration degree from the University of the Philippines Diliman.

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Policy Note

Transport Priority for Infrastructure vs. Services: BBB and Urban Transport Policy

Romeo B. Ocampo†

The Build, Build, Build (BBB) Program was launched by the Duterte administration in 2017 as its strategy to hasten economic growth and deal with transport problems, including the critical traffic congestion in Metro Manila. Implementing BBB, however, may be easier ordered than done. This policy note tries to show how BBB is part of the legacy of historical and present-day partiality to road-building. Caution is particularly called for in using road infrastructure, which have been hobbled by various constraints, which have been hobbled by various constraints, which have been hobbled by various constraints, as the leading solution to traffic congestion and other transport problems in large urban areas. The challenges in transport planning and design are much more formidable, as indicated by the shortcomings of past plans and projects against the problems. The roadbuilding solution to traffic congestion is short-lived in effectiveness due to induced travel demand. Studies abroad show that this is a complex phenomenon in which land development along road improvements influence traffic and deserve systematic attention. Such studies should also be undertaken in our metropolitan areas to ascertain whether and to what extent the findings abroad apply to our context. The article concludes with suggestions for attending to some unfinished business in urban transport policy, planning, and administration. It ends with parting notes on the study of public services and Public Administration.

Keywords: *transport infrastructure, transport services, Duterte administration, transport planning*

The Build, Build, Build (BBB) Program launched by the Duterte administration in 2017 would usher in "the golden age of infrastructure" as its strategy to hasten economic growth and deal with transport problems, including the critical traffic congestion in Metro Manila that had been brewing for quite some time. As a whole, BBB is intended to reverse the infrastructure deficit and under-spending of previous years, create jobs, and stimulate economic activities in line with the medium-term Philippine Development Plan 2017-

2022 (National Economic and Development Authority [NEDA], 2017a). As a mostly-transportation program, its land, airport and seaport projects, including interisland bridges, may be viewed as a renewed effort to link the parts of the Philippine archipelago much closer together.

Implementing BBB, however, may be easier ordered than done (or done well). Infrastructure projects have been hobbled by various constraints, such as right-of-way acquisition problems in construction, lack of agency absorptive capacity, and defective and corruption-ridden contracts. In the case of land transport, some words of caution are in order when it comes to pushing infrastructure to solve traffic congestion and improve mobility and accessibility in the urban regions. Transport planning and design may be simpler in rural areas, but in larger and more complex metropolises, the challenges are much more formidable, as indicated by the shortcomings of past plans and projects against the problems that culminated in the Metro Manila "traffic crisis."

Caution is particularly called for in using road infrastructure as the leading solution to traffic congestion and other transport problems in large urban areas. The construction of new, extended, or expanded roadways as the conventional approach has been known abroad to provide only temporary relief for traffic congestion and may bring serious environmental and other impacts if pursued without adequate regard for its service and wider objectives. Although infrastructure aims ultimately at service provision, in practice, they could compete for resources and priorities, require different activities, agencies, and actors, and the former may fail as a lasting shortcut solution to service problems. More specifically, studies show that the benefits of the default road-response to traffic congestion are short-lived due to the phenomenon of induced travel demand.

This policy note will try to show that the BBB is enamored with infrastructure, the legacy of historical and present-day partiality to roadbuilding. In urban land transport, services by road-based modes (e.g., buses, jeepneys, other public utility vehicles or PUVS) are provided usually at lower priority and funding levels. Recent plans show awareness of more innovative approaches, such as travel demand management (TDM), but not explicitly of induced travel demand. This will be discussed later along with related developments and issues. TDM practices in Metro Manila will be described to illustrate instances of discretionary deviations that are supposed to be characteristic of services, along with other decision-making patterns. The article concludes with suggestions for attending to some unfinished business in urban transport policy, planning, and administration. It ends with parting notes on the study of public services and Public Administration.

Characteristics of Services

Urban land transport, including public transport, illustrates some of the distinctive characteristics of services that present peculiar difficulties not found in or different from those in infrastructure. Infrastructure represents physical goods whose production, quality, and results are more visible and easier to monitor and evaluate. On the other hand, services are intangible and its processes, outputs, and consequences are harder to observe or pin down. Such differences between goods and services have been magnified by the rise of the latter over the former in post-industrial economies. Without necessarily resulting in global de-industrialization, this trend has persisted and created problems of adjustment to more knowledge-based, service-dominated economies in countries like China.

The implications of the post-industrial trend for modern organizations were highlighted in the early 1970s by Herbert Simon (1973, 1997). Aside from pointing out that the quality and other features of services are difficult even to precisely define, Simon said that the surge of services signaled greater awareness of their wider externalities and made top-side organizational decisionmaking more important. Few seem to have heeded Simon's call, although the public services, along with infrastructure, comprise the bulk of the work of modern governments. Scholarly works on public services tend to pigeonhole them under "service delivery," as though they do not entail any productive preparation.

More recently, however, some scholars have drawn attention to persistent organizational and administrative problems due to the peculiar characteristics of services. Since their processes and outputs are intangible, coping organizations (e.g., of academics and police) suffer from continuing internal strife over issues of appropriate indicators—in contrast to the visible elements in the production-type organizations (Wilson, 1989, as cited by Schuck, 2014). Being less legible, service outputs and processes are vulnerable to deviation from planned or authorized courses of action. Discretionary and transaction-intensive public services or parts of services are an abiding source of administrative capacity problems in developing countries, according to some development scholars (Pritchett & Woolcock, 2003). Some scholars have sought this line of inquiry by promoting *service characteristics approach* (Batley & McLoughlin, 2015; Chandi, n.d.).

In this article, no hard-and-fast distinction is assumed between transport infrastructure and transport services because, in practice, they could get mixed as they near service delivery and may share problems such as those arising from the exercise of discretion. Nonetheless, there are significant differences between them. A road project may be designed by a different group of planners and engineers and, when completed, will be followed by more planning for general traffic and for public transport (PT) routes, adoption of rules and regulations on road use and traffic enforcement.

PT has its own norms, complex activities, and requisite technical skillsets. Road planners aim to enhance overall accessibility, while road use and PT planners emphasize the goal of mobility. PT planning, policy, and organization may be multilevel, ranging from strategic and tactical planning down to direct operations or service contracting, engaging in the intricacies of timetabling, and grappling with the challenges of dealing with public transport passengers and other roadusers, especially private cars, the dominant consumer of road space and now the main problem of countries deluged by motorization.

The differences between road and service projects are reflected by the comment of a New Zealand group on "trying to analyze public transport projects as if they were roading projects" (Greater Auckland, 2010, para. 1). One pitfall of this approach relates to the "frequency of public transport services, to which there is no real counterpart in road projects" (para. 1). The importance of PT projects "is generally underrated by transport planners who come from a roads-based background" (para. 1). This may provide insight into simplistic perspectives on traffic congestion. The interactions between road and transport service, however, are shown to be more complex by studies of the phenomenon called "induced travel demand," whose results will be gleaned later.

Prelude to PBB

Roadbuilding has been given priority in the Philippines since the American takeover of the colony by Spain at the turn of the 20th century. Road conditions in Luzon were so bad that this big island was viewed as an archipelago itself (Dick & Rimmer, 2003). The new colonial masters therefore made a big show of their roadbuilding priority, with a governor-general calling himself "El Caminero" to identify with the lowly road workers. The new roads soon favored motorization. Railroads and *tranvias* had begun operating in and from Manila before the Americans arrived (ALMEC Corporation, 2014), but buses, trucks, and cars then successfully competed with the rail service and sustained the road-building program in Luzon and in other islands.

Producing readily creditable physical facilities, roadbuilding continued as a politically attractive, state-supported program after Philippine independence. It laid the basis for motorization and car dominance, particularly in Metro Manila, which was also favored by state incentives for car manufacturing (or assembly). Road-based PT modes, mainly the privately-operated buses and postwar jeepneys, also proliferated, carrying most of the passengers but occupying increasingly less of the road space compared to private cars. The increase of PT units in number and kind was facilitated by deregulation and lax administration of entry-exit rules, with taxis, vans, and tricycles added—and motorcycles now bidding to be legalized as public utility vehicles (PUVs). PT service has been augmented by urban rail service with three systems operating (LRT 1, LRT 2, and MRT 3) and carrying a big share of the daily commuter burden in the metropolitan region.

Box 1. Planning and Policy Documents Relating to Land Transportation (1998-2017)[1]

• ALMEC Corportation. (1999). *Metro Manila urban transportation integration study* (Final Report, SSF JR 99-036 [2/16]). Japan International Cooperation Agency. https://openjicareport.jica.go.jp/pdf/11580453_01.pdf

• Kellog Brown & Root Pty. (2010). N*ational transport policy and planning study* (Executive Summary). Philippine-Australia Partnership for Economic Governance Reform and Australian Aid.

• Asian Development Bank. (2012) *Transport sector assessment, strategy, and road map*. https://www.adb.org/sites/default/files/institutional-document/33700/files/philippines-transport-assessment.pdf

• ALMEC Corporation. (2014). *Roadmap for transport infrastructure for Metro Manila and surrounding areas* (Regions III & IV-A) (Summary) https://www.neda.gov.ph/wp-content/uploads/2015/03/FR-SUMMARY.-12149597.pdf [Referred to as NEDA Roadmap in the text of this paper]

• Japan International Cooperation Agency, ALMEC Corporation, & Oriental Consultants Global Co., Ltd. (2015). *The project for capacity development on transportation planning and database management in the Republic of the Philippines - MMUTIS Update and Enhancement Project (MUCEP)* (Project Completion Report). Japan International Cooperation Agency (JICA) & Department of Transportation and Communications (DOTC). https://openjicareport.jica.go.jp/pdf/12247615.pdf

• Japan International Cooperation Agency, ALMEC Corporation, & Oriental Consultants Global Co., Ltd. (2015). *The project for capacity development on transportation planning and database management in the Republic of the Philippines - MMUTIS Update and Enhancement Project (MUCEP)* (Manual Vol. 3 - Urban Transportation Planning). Japan International Cooperation Agency (JICA) & Department of Transportation and Communications (DOTC). https://openjicareport.jica.go.jp/pdf/12247656_01.pdf

• Japan International Cooperation Agency, ALMEC Corporation, & Oriental Consultants Global Co., Ltd. (2015). *The project for capacity development on transportation planning and database management in the Republic of the Philippines - MMUTIS Update and Enhancement Project (MUCEP)* (Manual Vol. 4 - Urban Transportation Planning). Japan International Cooperation Agency (JICA) & Department of Transportation and Communications (DOTC). https://openjicareport.jica.go.jp/pdf/12247664.pdf

• Integrated Transport Planning Ltd. (2014). Metro Manila Road Transit Rationalisation Study (Final Report, June 2014). World Bank.

• Integrated Transport Planning Ltd. (2016). Metro Manila Road Transit Rationalisation Study: Development of Mass Transit Corridors (RTRS2) (Final Report, January 2016). World Bank.

• Department of Transportation. Department Order No. 2017-011. *Omnibus guidelines on the planning and identification of public road transportation services and franchise issuance*. (2017).

The mounting growth of population and activities in Metro Manila (population: 11.9 million in 2010, projected to 13.1 million by 2020) has brought various problems as well as progress, with marginal settlements expanding along with the domains of affluence and big business. Transport deficiencies have metastasized into a traffic crisis, which is considered part of the larger infrastructure crisis that BBB is supposed to tackle. Traffic congestion generates delays estimated to cost Php2.4 billion a day, which is expected to balloon if nothing is done about it. Both infrastructure and service improvements tried before have been found wanting, and plans and proposed reforms and innovations have fallen short of implementation, let alone actually meeting the pent-up needs of multitudes of commuters and motorists waiting daily for the next PT ride or the green light at choke points.

Like the BBB, the transport plans preceding it (see Box 1) have not ignored service needs but nonetheless retain the partiality toward infrastructure solutions. Nominally, this is reflected by referring to themselves as "roadmaps" and, more substantively, by their investment priorities for road projects, though rail has also been emphasized. This is evidenced by the *Roadmap for Transport Infrastructure for Metro Manila and Surrounding Areas* (2014), which was prepared by a Japan International Cooperation Agency [JICA] consulting firm for the National Economic and Development Authority (NEDA), in cooperation with its infrastructure staff, to provide inputs into the infrastructure chapter of the medium-term Philippine Development Plan (PDP) 2017-2022 (NEDA, 2017). The PDP in turn has served as the basis for the BBB program, though this has undergone some modifications.

What this article refers to as the NEDA Roadmap is nationwide in scope, covering airports and seaports as well as land transport facilities, but is focused on three nested study areas of Metro Manila, Mega Manila, and "Greater Capital Region" (GCR)[2]. It covers three time periods up to 2030, though the PDP 2017-2022 and the BBB incorporate mainly the medium-term transport provisions (referred to as "TRIP" or the Three-Year Rolling Infrastructure Program) or "Dream Plan" (ALMEC Corporation, 2014).

Unsurprisingly, the primary concern of the Roadmap is the road conditions in the metropolitan and national road networks. Metro Manila had a well-articulated network of radial and circumferential roads, albeit with some missing links, but the presence of greater and growing numbers of motor vehicles "makes the roads disproportionately inadequate" (ALMEC Corporation, 2014, p. 2-4). Major roads, bridges, and related projects would thus get the biggest share of medium-term investments, though rail would have the lion's share over the longer period. Road-based PT modes (buses, jeepneys, but also new bus rapid transit or BRT units) and traffic management would get the least (ALMEC Corporation, 2014, p. 5-10, Table 5.1), though these elements faced at least equally formidable challenges in the urban areas. Road-based PT modes carry

most of the ridership in Mega Manila and are expected to retain much of this burden up to 2030, as "car travel accounts for 30% of person-km [trips], but constitutes 72% of road traffic." (ALMEC Corporation, 2014, p. 2-6). The "no traffic congestion" target of the Dream Plan is thus a tall order, since traffic congestion is being experienced 6 AM to 9 PM, and its daily cost is expected to balloon to Php6 billion if nothing drastic is done about it. What is proposed, however, is the conventional roadbuilding response, with a good helping of rail infrastructure and service for public transport.

For Mega Manila, the Dream Plan proposes to build 137 km of roads, 504 km of intercity and urban expressways, and 318 km of urban/suburban railways, with minor provisions for pedestrian facilities, road-based PT, and traffic management improvements (ALMEC Corporation, 2014, p. 5-1). Under the plan's "do-maximum" scenario, the existing expressways totaling 300 km would be extended to over 800 km in the GCR by 2030; the expressways in Metro Manila increased almost three-fold from 54 km to 173 km. In Metro and Mega Manila, there would be extensive upgrades and new links between the main roads and new expressways, forming an integrated road network with existing ones. Major corridors are emphasized for both roadways and railways, but not smaller local roads and intermodal integration and service networks (ALMEC Corporation, 2014, p. 5-5).

PDP 2017-2022 Transport Provisions

The "golden age of infrastructure" views transport as the key of the PDP's spatial development strategy and, with communications, "connectivity" as the third of nine priority sectors (NEDA, 2017, pp. 10, 31, 52). The specific infrastructure provisions are located in Chapter 19 of the PDP under multiple layers of schematic frameworks.[3] Infrastructure would be one of three "foundations for sustainable development," ensconced between "just and lasting peace" and "ecological integrity." (NEDA, 2017, p. 299, Figure 19.4).

The PDP 2017-2022 shares the NEDA Roadmap's primary concern with roads. It also deplores the poor quality of existing PT modes, traffic congestion and road safety, and the failure of mass transit to effect a shift from private cars. The existing urban and regional commuter railways "face problems of interoperability," maintenance and rehabilitation, and COA restrictions on spare parts, limiting inventory to only three months when they need many more. (NEDA, 2017, p. 285). No mention is made, however, of the well-known fact that most paved roads are classified as national, and that local roads are of poor quality and are much shorter overall.

The PDP 2017-2022 more explicitly proposes transport infrastructure and services in its expansive provisions and the need to develop intermodal networks to enhance connectivity and mobility (NEDA, 2017, p. 301). These

should support new economic centers in line with innovative land use and urban planning methods, including transit-oriented development schemes, the township approach, mixed-use and high-density developments. Such support should be ensured organizationally with transport agencies continuing "to forge convergence programs with [other] concerned agencies" (NEDA, 2017, p. 301).

BBB's Provisions

While not explicitly branded as BBB, this program emerged as the Duterte administration's leading strategy of what was dubbed "DuterteNomics." As in the PDP 2017-2022, projects are not described in as much detail as in the transport plans. Nonetheless, BBB's rollout presentations boasted of its flagship transport projects including the first subway ever designed for Metro Manila and the roads and railways in Luzon and Mindanao. The lists of projects and their corresponding proposed funds give a fair idea of BBB's priorities (See Table 1 for five-year TRIP budget).

Transportation would take up to 58% of the five-year TRIP investment total of Php4 trillion. In particular, roads would use most of the allocated and budgeted funds, but PT services would apparently have an increased share in number of projects as well as funds. According to Basilio (2018), 19 road projects (including 10 started by the Aquino administration) have been ongoing under the Department of Public Works and Highways (DPWH). Under the BBB, the DPWH has 24 projects costing a total of Php291 billion, while the Department of Transportation (DOTr) has 31 projects costing Php1.072 trillion or 13% of the total infrastructure investments (Php8.3 trillion) proposed for 2017-2022.

Table 1. Three-Year Rolling Infrastucture Program: 2018-2020 (in billion pesos)

Sectoral breakdown	2018	2019	2020	Total	Share
Transportation	627.37	764.56	937.84	2,329.77	58%
Water resources	79.21	72.55	87.26	239.02	6%
Social infrastructure	390.90	339.88	312.70	1,043.48	26%
Energy	15.08	12.36	12.67	40.11	1%
ICT	53.17	41.54	18.14	112.85	3%
Others	17.72	14.95	19.99	52.66	1%
Admin Bldg	85.92	72.28	19.99	196.99	5%
Total	1,269.37	1,318.12	1,427.39	4,014.88	100%

Source: Pernia, 2017 as cited by Patalinghug, 2017, p. 19, Table 5

This skewed allocation between the two departments represents a big break from previous practices. The DPWH usually received far bigger shares than the DOTr, as shown by Patalinghug (2017, pp. 12, 27, & 28; See Tables 2 and 3). No explanation for this shift has been offered, but this article indicates the DOTr's bigger burden for both infrastructure and services under the BBB, particularly in Metro Manila.[4]

The national budget proposed for 2018 show that road projects would still dominate the BBB transport proposals. In the *2018 People's Budget*, Php424.9 billion or 38.7% of the Php1.1 trillion total budget for transport would go to road network; the airport, rail, and seaport projects would get much less (Php35.3, Php26.0, and Php2.8 billion, respectively).

The National Capital Region (NCR) or Metro Manila would get most of the DPWH's regionally allocated infrastructure resources (7.9%), though of the department's total budget, 62.1% would cover nationwide projects (DBM, 2017, p. 133). Some big-ticket transport infrastructure projects are located in Metro and Mega Manila. Eight had been approved by the NEDA Board as of 27 July 2018, mostly railway and bus rapid transit (BRT) projects under the DOTr and only one (Bonifacio Global City Road Link) under the DPWH. However, 26 more projects in the pipeline toward NEDA Board approval—mostly DPWH road and bridge projects, including the C3 Missing Link and SLEX (South Luzon Expressway) projects in the NCR and Mega Manila.

Table 2. Top 10 Departments in Terms of Infrastructure Spending (in million pesos)

Department	2015	% Share	2016	% Share	2017	% Share
DPWH	273,457	47.50	373,586	49.39	429,693	49.93
DepEd	63,870	11.10	84,879	11.22	119,697	13.91
DOTr	21,419	3.72	23,478	3.10	28,546	3.32
DA	13,759	2.39	17,425	2.30	11,709	1.36
DILG	10,111	1.76	10,293	1.36	7,308	0.85
DOH	9,684	1.68	19,271	2.55	11,849	1.38
DENR	8,174	1.42	7,924	1.05	10,365	1.20
DFA	593	0.10	2,764	0.37	1,103	0.13
DOF	540	0.09	2,120	0.28	1,400	0.16
DOST	538	0.09	1,016	0.13	3,048	0.35

Source: Patalinghug, 2017, p. 28, Table 8; DBM, 2017

Table 3. Infrastructure Program 2017-2018 in the Proposed 2018 Budget for BBB Projects (in billions of pesos)

Programs	2016 GAA	2017 (Adjusted)	2018 NEP
Road network	304.6	327.6	424.9
Seaport systems	1.8	2.6	2.8
Airport systems	28.6	35.5	35.3
Railways	12.5	22.1	26.0
School buildings	91.3	78.6	92.7
Buildings	28.6	35.8	35.3
Hospitals, health centers	19.2	11.3	22.3
Flood control systems	69.0	82.0	133.4
Irrigation systems	23.6	27.5	28.7
Water supply systems	7.7	10.0	6.4
Power supply systems	8.5	4.8	4.2
Reforestation projects	7.6	6.6	7.4
Total	858.1	858.1	1,097.5

Source: DBM, 2018a, p. 28; DBM, 2017, p. 37; DBM, 2018b, p. 132.

Overall, the transport projects centered in Metro Manila represent an impressive array dominated by road and railway networks. Some of the projects have undergone changes, delays, and resumptions. These include the later phases of the BRT, LRT extensions, and the new northeast-bound MRT-7, whose construction actually commenced in mid-2017 after long delays on rail station issues. The subway, a first in the country, would use "Japanese tunneling expertise." MRT-7 will connect Quezon City and Bulacan and loop around with a new roadway. "LRT-1 is finally being extended to Cavite after years of delay. All three [urban railway] lines will be connected to MRT-3 via the Common Station (in Quezon City's Central Business District [CBD]), a project that took eight years just to identify a location" (DOTr, 2017, p. 20).

A notable feature of traffic patterns and road and rail proposals in Metro Manila is their focus on CBDs and convergence toward old Manila. This raises the question whether such convergence, if sustained by the pursuance of the plans, will relieve or reinforce traffic congestion in the metropolis' core (Ocampo, 2018). Quezon City Mayor Herbert Bautista apparently shares this concern about the impact of convergence on its CBD, where two pre-existing big malls are located.

Imagine—the mayor writes in his annual report—the convergence of 500,000 people from neighboring provinces on its common rail station. This will bring a "tremendous boon" to business but pose "a continuing challenge in

providing security, safety and convenience for the public." Bautista adds:

> Even the construction of the huge station itself will require management ingenuity and large amounts of public patience. While we are aware of the long-term benefits of the Build, Build, Build Program, we also temper their plans, as much as we can, the cutting of trees along our thoroughfares.[5]

Induced Travel Demand

Such questions about traffic congestion may be illuminated by studies of induced travel demand. Those intimidated by a traffic crisis may take comfort in a theory that traffic congestion is self-limiting, that eventually some motorists avoid gridlocked areas, thus reducing congestion (see Litman, 2001). On the other hand, according to the induced travel demand idea, active road-building responses have provided temporary relief from congestion in large and crowded urban settings. This implies that this will not happen in or between sparsely populated settlements.

According to Cervero (2009) of the University of California's Transport Center, who has devoted a great deal of his scholarship on the matter, a recurrent criticism of road responses to congestion is that their success is "short-lived: in fairly grown-up cities with reasonably buoyant economies, additional road capacity gets quickly consumed by newly-generated traffic, what is called 'induced traffic'" (Cervero, 2009, p. 214). In addition to such *generative effect*, improved roads may divert trips from parallel routes (*redistributive* trips). Both effects return a road to its original congested condition, though the generative trips are viewed as the truly inducive kind. Failure to account for such extra trips has led to many regional plans being mired in controversy and cancellation or suspension in the US.

However, Cervero (2003a) wondered whether the claims of induced travel were based on sound methodology. Existing studies, he noted, often jumped directly from road improvements to traffic growth without accounting for the influence of intervening variables and two-way causality. He sought to fill these gaps through a path model that considers (1) short-term *behavioral shifts* in modes, routes, and times of travel to exploit added road capacity, and (2) long-term *structural changes* in residential, commercial, and other land uses exploiting the road improvements nearby.

Both kinds of trips may increase due to enhanced road capacity. The generative trips, which represent the induced travel proper, comprise "formerly suppressed trips, longer trips [due to] free flowing traffic, and modal shifts" (e.g., from PT to private cars) (Cervero, 2003b, p. 146). The redistributive trips are discounted from studies as not contributing to total net traffic addition (i.e., indicated by vehicle-miles travel or VMT). A two-way causality analysis showed

a moderate near-term increase in induced travel demand and a more significant increase in induced land investment.[6]

Tracing the causal chain further, Cervero (2003a) made clear that road investments alone do not increase traffic volume but "only by conferring a benefit, like faster speeds" (p. 24). The length of lane-mile added, existing congestion level, and level of analysis (e.g., county or region) also matter. Studies should go beyond short-term travel behavior into long-term structural changes to disclose the effects of land development investments, which would remain crucial as long as they are deemed potentially profitable (Cervero, 2003a, p. 25).

In a follow-up path-analytic study of 24 California freeways (on 1980 to 1994 data), Cervero found land development intervening between road expansion and travel increases in both short and long terms. The key development indicators were building permits along four-mile impact buffers along the improved freeway stretches. Short-term travel increases due to behavioral shifts "can quickly erode speed gains. Equilibrium will eventually be reached as speeds and travel volumes adjust to each other" (Cervero, 2003a, p. 25).

Over longer periods (the 18-year chain in his study), added road capacity and higher speeds combined to "increase floor space and numbers of housing units along an improved freeway corridor" (Cervero, 2003a, p. 25). Travel speed increased by 80% for every 100% road capacity increase, reflecting the influence of previous travel speeds and land-use changes. The added road capacity, however, actually accounted for only about half of the gains in travel speeds and number of building permits. External factors like employment and income growth reduced the influence of road increase to 40% of the total travel gains, "substantially less than reported by past induced-demand studies" (Cervero, 2003a, p. 26).

The remaining influence of road enhancement nonetheless confirmed the basic validity of the induced demand proposition. Moreover, Cervero (2003a) points out that path analysis offers useful policy information by the shares of short-term travel increases and long-term land-use shifts. From his studies and reviews, Cervero (2003a) concludes that while some knowledge gaps have been covered, much remains unknown. Path analysis at other sites, more and better research and forecasting methods, rational road use and pricing, and careful land-use planning and management are needed (Cervero, 2003a, p. 27).

Aside from Cervero, other authors have confirmed the influence of induced travel demand in the context of the relative issue of traditional transport planning emphasis on mobility vs. accessibility, and a paradigm shift favoring greater attention to the latter (Handy, 2005; Litman, 2001; Ocampo, 2017a).

Reactions to Road Response

Reactions to the frustrations with the limited effectiveness of the default road response to traffic congestion have ranged from changes in or pricing of road use, restrictions on the volume of motor vehicles on the road, and the removal and replacement of elevated freeways, among other travel demand management strategies.

Pedestrianization

The conversion of existing roadways to pedestrian use has been one option often resorted to or recommended. In Nuremberg, Germany, transport planners initially doubted whether the traffic-laden streets around the CBD could be converted to a pedestrian network. When it was done in stages (from 1972-73 to 1988), their worst fears disappeared as 71% to 80% of the pre-existing motor traffic "simply dissolved" (Newman & Kenworthy, 2015). Pedestrianization was also part of a comprehensive reform process in Zurich City, Switzerland to implement a policy to shift priority to public transport from car dependence (Mees, 2010).

The pedestrianization subproject in downtown Alborg City, Denmark was initially foiled by entrenched businesses, which extracted a compromise including PT and bicycle services but no car restrictions. The result was a 50% increase in PT and bicycle traffic and increased car traffic instead of the 35% reduction first expected. Later, however, the Alborg project was rebuilt on its ruins and received a European Union award (Flyvbjerg, 2001). What happened to pedestrianization remains unclear in the book, however, probably because the author's main interest is to illustrate his phronetic method of social science research.[7]

Freeway Removal and Replacement

As extreme results of road additions, elevated freeways abroad have been severely criticized for adverse physical, economic, and social impacts, including traffic jams and environmental degradation—"[forming] barriers and visual blights, casting shadows, and spraying noise, fumes, and vibrations on surrounding areas" (Cervero, Kang, & Shively, 2009, p. 32). Therefore, fed-up communities have risen in "freeway revolts," resulting in deconstruction in US and other Western and even Asian cities (See Table 4).

Some freeways have been replaced with at-grade boulevards, arterials, and linear parkways, reallocating scarce city land "away from cars and to … greenways, bus rapid transit lanes, and civic plazas" (Cervero, 2009, p. 225). Freeway removal initially raised fears of gridlocks, but these were dispelled when

the replacements improved amenities for residents, revived local economies, and raised land values along the improvements.

Table 4. Elevated Freeways, Roads, and Bridges Removed or Closed

Location	Facility affected	Replacement	Traffic and other impacts
New York City	Section of West Side Highway collapsed, 1973	Most of its route closed	53% of highway trips disappeared, 93% of them did not reappear elsewhere (per 1976 study)
Portland, Oregon	Harbor Dr. Freeway, 1974	37-acre waterfront linear park	No traffic chaos; downtown revitalized with LRT and sound urban design for pedestrians and transit users
San Francisco, California	Embarcadero and Central Freeways, 1989 and 1996	award-winning boulevard, urban park	No chaos followed; some traffic volume increase in surrounding streets but well within their capacity
Melbourne, Australia	Street carrying 30,000 vehicles closed, 1992	Swanson St. Transit Mall created instead	Traffic dropped 40%
London, United Kingdom	Ring road closed, 1993	Swanson St. Transit Mall created instead	Original traffic levels did not resume after 3 years
	Tower Bridge closed, 1994	Later reopened	21% of motorists switched to public transit, walking, cycling; no marked increase in congestion around
	Hammersmith Br. closed except to buses, cyclists	Soon reopened	21% of motorists switched to public transit, walking, cycling; no marked increase in congestion around
Boston, Massachusetts	Central Artery (Interstate 93) removed, 1980s-2000	"Big Dig" 3.5 mile tunnel, greenway	Comments available mostly on cost-overrun to US$15 billion, not on project outcomes
Seoul, South Korea	Cheonggye freeway & road underneath, 2003-2005	Park, pedestrian-way, revived stream	Traffic speed rose in the city by 1.2 km/hr vs. fears of gridlock, reform led to "road diet" with new bus lanes
Milwaukee, Wisconsin	Park East Freeway "recently torn down"	New Urbanism town, 6-lane boulevard	No comments available on outcomes

Source: Newman & Kenworthy, 2015, pp. 152-153; Cervero, Kang, & Shively, 2009, pp. 31-33. Cervero (2009, p. 211) added Hong Kong to his in-depth analysis of San Francisco's and Seoul's experiences, in its case with value capture from air rights sale around train station.

Nearly 20% of survey respondents made fewer trips since the freeway closures in one study area, but the multi-way replacements had large enough capacity to absorb some of the former freeway traffic. The planners insist, though, that accommodating redistributing traffic was not intended and was a "misapprehension" of good urban design and boulevard operation. (Cervero, Kang, & Shively, 2009, pp. 47-48).

The projects in San Francisco, Seoul, and Hong Kong resulted in financial gains, given the good urban design followed, and, with world-class PT and better walking environments, could enhance "place-making" even with more limited mobility. Indeed, the anti-freeway changes generally "represent a paradigm shift from designing cities for 'automobility' to a focus on 'livability' and to a post-modernist perspective of infrastructure and its role in the city" (Cervero, 2009, p. 216).

Accounts of freeway removal and replacement may also be found elsewhere, as in Newman and Kenworthy's The End of Automobile Dependence (2015), which asserts that "Freeway removal is now becoming a worldwide phenomenon" (pp. 152-153, 220-222).

Density and Public Transport

The more basic strategy of addressing urban traffic and other transport problems by promoting mass transit public transport (PT) modes instead of cars has provoked a debate about the role of urban density in the fate of PT systems. According to its defenders, a minimum density is a necessary condition for the good performance and financial viability of PT systems. Critics debunk this as "density delusion."

Cervero views this question as a more complicated process of countervailing influences. According to Cervero (2009), "[w]hile dense cities are more conducive to successful public transport, they also tend to have denser automobile traffic and thus require more road improvements, potentially a countervailing factor" (p. 215). His analysis of 2003 data in 370 urbanized US areas showed that higher population densities were negatively associated with VMT (vehicle-miles travel) per capita (direct negative elasticity of -.604). But this "travel-eroding impact" was partly offset by high *road densities* (Cervero, 2009, p. 215). This implies that adding road density can raise travel speed, but, as earlier discussed, this increase can in turn be dampened by induced demand and by the return of pre-existing traffic congestion.

The debate about density, however, has hinged more on the fate of public transport. Newman and Kenworthy (2015) insist that density, along with mixed-use development and otherwise sound urban design, can multiply and sustain the use of mass transit modes. Even low-density cities can be served by mass

transit, as shown by rail service in an Australian city. A famous graph resulting from their global surveys, however, misled other authors into thinking that in their mind, density alone is the fix available on automobile dependence. In turn, they accuse the critic of "density delusion," Paul Mees, of advocating PT service-level improvement alone as the solution to car dominance (Newman & Kenworthy, 2015).

In fact, the noted Australian transport planner and urbanist Paul Mees presented a more comprehensive and tighter set of arguments for extending in his book *Transport for Suburbia: Beyond the Automobile Age* (2010). Mees (2010) criticizes the density doctrine for tending to confine PT systems within urban core areas for fear of low density eroding their financial viability. But such systems often fail anyway, lacking the scope and integrated, intermodal properties that could ensure service improvements and progressive outreach. Mees argues theoretically and illustrates empirically that PT service can be extended to lower-density peripheries through an inter-modal route network with passenger transfer facilities for wider interconnectivity and that produces synergistic "network effects" through economies of scope rather than of scale.

To prove his points, Mees (2010) recounts the experiences of a number of Canadian, Australian, Swiss, and other cities which have performed well in terms of increasing patronage, financial performance, and service-level improvements, compared to those that have not conformed with his network model and thus have failed or foundered, including particularly those that have continued to engage in intermodal competition instead of collaboration.

Incidentally, Mees' reasoning for extending PT service outward may offer an answer to the concern about traffic convergence aggravating congestion in core areas in Metro Manila. He insists that the potential success of expansion depends on the quality not only of the road but also of the services provided and the route patterns developed. The service must be attractive to new as well as old travelers by making intermodal transfers well-synchronized, convenient, affordable and farther-reaching, with more direct interlocal links in peripheral areas that also generate more local rather than metro-wide trips.

The radial traffic convergence in a larger region may be mitigated through the development of stronger alternative urban "counter-magnets" to draw away traffic otherwise bound for its core areas, like old Manila and emerging Quezon City. What has been called a more "multi-destinational" network (Thompson & Matoff, 2003, as cited by Mees, 2010; Brown & Thompson, 2012) may induce a reverse pattern of regional decentralization of investments, jobs, residences, and people over the long term. Hopefully, this process could begin sooner even with the current plans to compensate for the convergence-induced traffic congestion.

Technical and Institutional Factors

While external circumstances such as population and economic trends help account for travel problems, technical and institutional factors have been cited as well in connection with efforts to solve them. But such endogenous or internal factors often become parts of the problem instead of the solution.

In their studies of megaprojects (e.g., Boston's Big Dig and the UK-France Channel Tunnel), serious doubts are raised about the reliance on public-private partnership strategies, long delays, huge cost overruns, and obsolete forecasting methods. These methods usually underrated predicted patronage rates of road projects and overrated those of rail, remained unimproved for 30 years, and were often tainted with the excessive enthusiam of profit-motivated project promoters (Flyvbjerg, Bruzelius, & Rothengatter, 2003; Flyvbjerg, Holm, & Buhl, 2002).

Mees (2010) scores conventional transport planners for adhering to economic theories and techniques that he says actual practices have successfully challenged. For their part, Newman and Kenworthy (2015) blame unreformed planners for perpetuating car dependence through their reliance on the four-step "predict and provide" forecasting model. They trace this back to the grand transport land-use studies that ignored PT and have remained unimproved since the 1950s. In particular, the modal split stage of the four-step model that originated from those studies reflects the modeller's desire to take PT out of account in order to make highway demand forecasting more efficient (Newman & Kenworthy, 2015).[8]

Newman and Kenworthy (2015) are optimistic about the progress and prospects of the decline of automobile dependence in various countries. This trend has been supported by the decoupling of the car industry from the rest of the economy and the de-linking of car ownership from income growth. But they insist that the default roadresponse to traffic and transport problems remains alive and well: "most models are still premised more on a supply-side approach of greater road infrastructure solve circulations problems and other perceived transport inadequacies in cities" (Newman & Kenworthy, 2015, p. 147).

Institutional factors are recognized by planners as also figuring crucially in the design and performance of urban transport systems. Regulatory policy determines the rate of entry and exit by private and public modes into the circulation system. Strict or lax, its role in PT could be decisive, particularly where private operators are numerically dominant. Recommended reforms have centered on shifting from passive franchising with few operator obligations, toward proactive planning with service-based contracts that would raise competition from the road to the tendering room, such as has been proposed for the atomistic, freewheeling PT market in Metro Manila and the rest of the Philippines.

PT organizational structure is usually conceived of as three-tiered: strategic for policy determination, tactical for service planning, and operational for service management (Ocampo, 2017b). But historically, PT organizations have depended on regulatory policy regimes (e.g., deregulation or "better regulation") and have had a checkered career ranging from municipal public monopoly in the early 20th century to privatized organizations and today's mixed public-private enterprise systems, with some privatized systems reverting to government authority.

To cite an example of the latter tendency, Paul Mees' (2010) ideal is a public monopoly that contracts out its service operations. It is like his Zurich "ZVV" exemplar, which is actually a confederation of state and private service providers with a common, small staff of 35 employees. This staff is responsible for multilevel planning and operations through private and public sector contractors. Its functions include marketing, finance, supervision of operators, and infrastructure under traffic planning. Urban design is not part of Mees' organizational design. He prefers direct policy and action on transport problems, rather than wait for minimum urban density to happen.

Such a strategy, however, may be difficult to pull off where effective urban development planning is called for to complement transport planning, such as when poorly controlled regional expansion has spawned urban sprawl. Unfortunately, the nexus between transport and urban planning appears to have been tenuous in our context, due at least in part to the intricacies of road-based public transport as a mostly privately provided public service.

Discretion and Decisionmaking in Metro Manila

Although the transport sector may develop enduring theories, techniques, and institutional frameworks, its standard models, templates, and organizations must at some points adapt to changing contexts and conditions through the exercise of discretion, which theory suggests is a characteristic of services. Practices in our context abound in examples of deliberate planning and decisionmaking that too often shade into discretion (or indiscretion).

Discretion usually means an unauthorized deviation, especially by subordinates and field implementors, from a prevailing formal policy, plan, or pattern of practice, or from established or emerging professional norms. However, if such a deviation is previously planned or sanctioned by higher authority, or does not otherwise violate some accepted custom or scheme, then it may be considered an ordinary decision. Nonetheless, the line between discretion and other patterns of decisionmaking is hard to draw or see in practice.

In infrastructure development, examples of both types of decision are not hard to find. Changes in a blueprinted road alignment, for example, may be made in the field by engineers or builders with, or without, the permission of

their superiors. Depending on delegation or decentralization rules, discretion in the field may be restricted and may require prior central clearance. Despite such rules, discretion may be abused, resulting in funded roads that are substandard, much shorter, or simply non-existent—horror stories in Philippine public works.

There are as many if not more opportunities and latitudes for discretion toward the service end of the transport spectrum, as may be gleaned from the plans we reviewed and from other sources:

- In PT planning, comprehensive route network planning was considered but explicitly rejected by the 1989 Metro Manila Urban Transportation Integration Study (MMUTIS) as impractical for the time. It was attempted by the MMUTIS Update and Enhancement Project (MUCEP) in 2015 but the project admittedly fell far short of comprehensive planning. In this case, however, the focusing of MUCEP's goals had the prior assent of the DOTC.

- As already mentioned, a package of PT reforms to turn to proactive planning with service contracts was strongly recommended to broaden the responsibilities of private operators in exchange for extended contracts and other new privileges. The shift was not implemented, however, though a controversial jeepney modernization project was pushed through by order of the President on the basis of partial route rationalization results.

- Some earlier changes and non-decisions probably weakened the Land Transportation and Regulatory Board (LTFRB) as the agency in charge of PT franchising. At one point, the DOTC pulled out its planning support from the LTFRB, but neither the department nor the Board acted upon a systematic support system recommended by the National Center for Transportation Studies (NCTS) of the University of the Philippines. This proposal included a set of meta-guidelines for LTFRB quasi-legislative rulemaking which, unlike its quasi-judicial process, was rudderless.

- LTFRB decisionmaking on the number of PT units to authorize has been characterized by non-use of its route measured capacity (RMC) formula and survey requirement for demand estimation. Invented in 1981, this method has fallen into disuse because it was defective, but its long overdue revision has not been done.

- Consequently, LTFRB decisionmaking on PT market entry-exit matters has tended to be arbitrary ("capricious," according to DOTC's own internal auditors), periodically lifting a long-standing franchise moratorium and admitting thousands of new as well as old types of PUVs (including Grab taxis) without apparent regard for their contribution to congestion in Metro Manila.

• On the other hand, the Metropolitan Manila Development Authority (MMDA) has been the primary regulator of traffic congestion. Long before the MUCEP suggested shifting away from supply-side approaches, the MMDA had been employing TDM, mainly in the form of volume reduction of vehicles on major roadways, traffic engineering, and traffic enforcement with the 17 local government units (LGUs) cooperating with their own enforcer personnel. The MMDA has also sought to move provincial buses out of Metro Manila with new common bus stations at two or three locations outside or near its perimeter.

• Collaboration in the metropolis, however, has produced fragmented policies. Unlike elsewhere in Metro Manila, number coding is on all-day in Makati City but non-existent in Marikina City, presumably as a result of their own decision at the MMDA, whose governing body consists of the 17 mayors. Another metro-wide policy, unified ticketing (traffic violation citation tickets) has been resisted by the LGUs, which have used their own tickets as well as their own enforcers in regulating traffic alongside the MMDA field personnel.

• Changes are frequently made in traffic regulation, e.g., manual overrides of traffic signals, relocation of U-turn slots, reroutings due to special events and road repairs, and diversion of traffic from the EDSA highway. This redistributive scheme has recently been reinforced with more determined efforts to tow away illegally parked vehicles and demolish unauthorized structures along alternate roadways.

• Traffic enforcement has been selective, focusing on a few types of violations (mainly of number coding rules) out of a long official list of potential infractions.

• Enforcers have turned a blind eye even on clearly hazardous practices, such as PUVs stopping midstream to pick up or let off passengers and driving at night with their headlights off or out of commission.

• Traffic enforcers sometimes deploy themselves out of their assigned stations and regularly stop certain vehicles without apparent probable cause (delivery vans seem to be a favorite target near one major intersection). While some suspects may be let off with just a warning, others may be offered a choice of the sort of traffic infraction to admit (i.e., between lighter and heavier fines), signaling an imminent shakedown. Enforcers caught in the act are penalized by their superiors.

• Operators provide their own instances of flagrant discretion or indiscretion. The urban railways are notorious for their overcrowding, unreliable schedules, and, in the case of MRT-3, frequent breakdowns in operation, forcing passengers to disembark midstream and to walk along the elevated track on the EDSA circumferential highway.

• These problems are attributed to poor maintenance, incompetent maintenance provider- contractors, and the purchase in China of new train cars that turned out to be incompatible with the existing railway and system. One wonders whether the choice made was merely an egregious error or a technical, professional misjudgment made murky by dubious motives and defective contracting procedures.

• This brings us back up to the institutional level of the train services. The three railways have resisted frequent calls for integration. They are run separately by state and private firms, and the neighboring Caloocan City terminals of LRT-1 and the privately run MRT-3 are not even linked physically. Despite repeated proposals for technical and organizational integration, one of the transport plans advocated autonomy for the railway firms for the sake of interservice competition. Fortunately, they have moved toward cooperation instead through common fare ticketing to facilitate passenger transfers.

• At the departmental level, the organizational reform proposals have been partial and fragmented. One was to reunite the DPWH and the DOTC as before, but this fell on deaf ears. Another was to separate the DOTC's regulatory from its operating function, but this too has not materialized. In his paper, Patalinghug (2017) describes more of the inter- and intra-agency problems of DOTr, with no indication that the BBB program has helped strengthen its multilevel institutional framework toward its accelerated implementation (pp. 34-43).[9]

Summary and Conclusions

In the preceding sections, this article has suggested that the BBB program has tended to sustain the longstanding bias for road infrastructure with comparatively minor attention to services in the transportation sector. The Philippines has not been alone in its partiality for infrastructure, which has been as internationally fashionable as a related preferred fix—"'infrastructure' has become a catchword on a par with 'technology'" (Flyvbjerg, Bruzelius, & Rothengatter, 2003, p. 2). Moreover, the BBB *AmBisyon* is justifiable in terms of our archipelago's need for greater interconnectivity and for economic stimulus through accelerated public works, although it has also raised some serious reservations about finance, private investment participation, and capacity to implement its projects, at least on time.

As far as urban transport is concerned, greater circumspection and care is called for the complex issues involved in the "primate city" of Metro/Mega Manila and in other urban-metropolitan settings. There are pitfalls to watch out for. The roadbuilding solution to traffic congestion is short-lived in effectiveness

due to induced travel demand. Studies abroad show that this is a complex phenomenon in which land development along road improvements influence traffic and deserve systematic attention. Such studies should also be undertaken in our metropolitan areas, if only to ascertain whether and to what extent the findings abroad apply to our context.

In a context of rapid urban growth and expansion, the supply-side approach of road building is likely to result not only in limited effectiveness on traffic congestion but also in adverse environmental, social, and economic impacts. Extreme reactions to elevated freeways in the form of local revolts, removal, and replacement raise red flags against overdoing this approach. Gentler options have been available, though, such as pedestrianization and the variants of TDM observed in Metro Manila.

Demographic and other exogenous factors also influence urban transport problems and solutions, such as the belief that urban density is a prerequisite to successful and viable public transport systems. This has been contested as tending to confine PT service to urban core areas, when it is theoretically and empirically demonstrable that it can be extended progressively to low-density peripheral areas.

Demographic, technical, and institutional issues have been raised in connection with the role of public transport modes in dealing with car dominance as a major impetus behind road-building and a source of traffic congestion and other harmful externalities. According to conventional belief, PT sustainability depends on minimum urban density, but density delusion has been severely criticized as confining PT service to urban core areas when Mees, the critic, has persuasively argued that it can be expanded progressively to lower-density suburban and rural peripheries.

In this light, the BBB program may be going against the tide of emerging professional opinion by continuing to strongly support roadbuilding, including freeways, in Metro/Mega Manila. The road network analysis and plans for these areas suggest a pattern of traffic convergence that may exacerbate congestion in core areas.

Such convergence may negate the benefits of expanded PT services, but this may be mitigated by promoting greater interlocal as well as circumferential connectivity outside the core and developing stronger alternative urban centers to divert potential traffic through the converging radial corridors. The development of a multidestinational rather than radial transport network may also induce decentralization over the long term, or, hopefully, sooner.

The BBB and its supporting plans do include provisions for improving PT service facilities through projects like BRT, a new subway, and railway extensions in the metropolitan region. Regulatory and traffic management improvements are likewise proposed, but with progressively less funding. One study, the MUCEP project, cites a suggestion to shift from supply-side to TDM approaches, though induced travel demand is nowhere explicitly mentioned in MUCEP's manuals.

In practice, transport agencies have long tried to cope with traffic congestion through variants of TDM and traffic management. These may have eased traffic over the long haul, but they also show cracks in the system due to discretionary and errant decisionmaking at different levels.

Overall, the plans preceding the BBB program point the way forward, but leave much unfinished business, and pitfalls like induced travel demand in urban regions call for cautious competence.

Recommendations

In view of the above, the designers and implementors of the BBB program should take account of the lessons suggested above by ideas and experiences abroad and at home, mainly by pursuing the worthwhile items of unfinished business left by previous plans, such as the following:

1) Adopt a clearer policy priority and more substantial financial support for public transport services as well as for infrastructure projects to meet consumer demands and needs. Related to this is the need to address the motorization problem through more direct measures against car dominance and dependency.

2) Ascertain whether and to what extent the BBB infrastructure plans would induce travel demand and thereby attenuate or limit the effectiveness of roadbuilding measures against traffic congestion in Metro Manila and other urban areas.

3) Review the potential overall impact of plans and projects to ensure that the circulation patterns they might sustain will reduce rather than aggravate traffic congestion in the urban core of the region and in local CBD or downtown areas. Consider the "counter-magnet" and multidestinational measures suggested above to counteract such convergence and promote regional decentralization.

4) Rather than incremental route rationalization, use comprehensive network planning for service routes as well as roads and railways, in order to promote

intermodal integration, continually improve PT operating and financial performance, and extend service outward to peripheral areas in Metro/Mega Manila. In this connection, consider promoting accessibility, more broadly and meaningfully conceived, as well as improved mobility, as another paradigm shift consistent with a reorientation to service and livability.

5) Implement the proposed shift from traditional passive franchising to service-based contracting supported by proactive planning, along with the policy, technical, and organizational changes that this will require to provide more rational guidelines, evidence-based support, and the primacy of public-interest norms for decisionmaking on private operators' entry and exit in the PT market.

6) Orient and link both franchising and traffic regulations like volume reduction more closely together and with policy restraints on motorization and car dominance. The MMDA and its 17 constituent LGUs should work more harmoniously by adopting common and coherent policies on urban development and transport regulation (e.g., on number coding and citation ticketing), and by providing more effective direction and supervision of traffic enforcers' field activities (e.g., with active inspectorates).

7) Pursue organizational reforms supportive of institutional innovations, approaching them more comprehensively and coherently, without ignoring the need to focus on specific promising areas or proposals, such as those already identified in the recent transport studies (e.g., structural innovations for multi/intermodal integration and operation, and for fare determination and collection).

8) Organizational and administrative reforms should aim to improve interdepartmental and intergovernmental coordination and collaboration; strengthen DOTr's capacity for policymaking and project development as well as for planning and regulation; a role for the MMDA in the DOTr's omnibus guidelines, especially for linking traffic regulation, transport planning, and urban development planning; and provide for more affirmative intergovernmental relations with the LGUs in transport planning and regulation.

More reflection and research is needed to arrive at firmer conclusions and recommendations than have been possible in this policy note to ascertain the past as well as prospective operation of induced travel demand and the existing and potential circulation patterns in Metro/Mega Manila on the basis of better data and knowledge about the rate and structure of urbanization.

The issue of discretionary decisionmaking inherent in service provision is a tough one to resolve. Economists tend to see too much of it being permitted

or tolerated in government practices and thus would eliminate or minimize its exercise. Scholars like Pritchett and Woolcock (2003), on the other hand, would rather "authorize" more of it beforehand as a matter of course. The latter is a more justifiable option since discretion seems inherently inevitable in public services and desirable for coping promptly with contextual contingencies, which are made more urgent today with disaster risks and critical emergencies. Rather than bulldozing ahead, perhaps BBB could take a leaf from the disaster risk reduction and management (DRRM) slogan of "Build Back Better"[10] infrastructure and services in both urban and rural regions.

If so, such expanded latitude should be accompanied by better central supervision (as with an effective inspectorate system) and closer monitoring and evaluation of its exercise in the field, as in traffic experiments and other departures from the normal. This means reappreciating supervision as a focus of the formal study of PA, as it once was when it was first introduced in the Philippines in the early 1950s (Ocampo, 2017c).

Parting Note on Public Services

This brings us back to our concern with public services in general as an important area of public policy and PA. This article has suggested that there is much more beyond and before service delivery than meets the eye, especially one gazing at infrastructure. Public services are replete with at least as many challenges as infrastructure development, and therefore share many of the "dilemmas and debates" discussed by Peters and Pierre (2018) in *The Next Public Administration*. According to these authors, as frontline service providers rather than topside bureaucrats, public employees "are less bound by legal constraints and more focused on the role of being a public servant" (p. 34). They point to the way that the so-called "street-level bureaucrats" in the US have reshaped formal policy in actual practice by having to exercise discretion in the field (Peters & Pier, 2018, p. 34). But there is a rub, or two, that students of PA may well address.

Discretion is needed to make sense of policy in specific, variable contexts, but its exercise (authorized or not) can be inept, even deadly. Aside from instances of failure to make the trains run on time (or at all) even under authoritarian rule, witness the bloody record of police protection against dangerous drugs. This has resulted from the futility well known in criminology of controlling discretion in the use of deadly force out there in the firing line.

A related, final point is that some public services have, among the people ostensibly served, victims as well as (or instead of) beneficiaries, if we consider regulation and protection as part of a broader and more interesting concept of public services. Students of PA, therefore, should include coercive as well as

affirmative forms in service if their efforts are yielding meaningful results about public policy and administration.

Endnotes

[1] These documents were reviewed by the author for the U.P. NCPAG COMPUTES Project, which was undertaken for the DOTr (Ocampo, 2018).

[2] Mega Manila includes Metro Manila plus the four provinces of Bulacan, Rizal, Cavite, and Laguna or BRCL for short. The GCR embraces Regions III and IV-A as well as Mega Manila.

[3] Nonetheless, it is a major part of the PDP with the NEDA director-general and planning secretary chairing the large planning committee for infrastructure.

[4] The NEDA Roadmap (ALMEC Corporation, 2014) had noted: "Within Metro Manila, the committed expressways (i.e., SLEX-NLEX connector, Skyway stage 3, and NAIA expressway) would provide adequate capacity in the major north/south corridor," (p. 5-5). The radial corridors need additional capacity and new "elevated expressways," while "the Skyway 3 extension to the north harbor and NAIA Phase 2 should enhance connectivity with the key traffic nodes in Metro Manila," (p. 5-5).

[5] In fact, MRT-7's excavations erased the vegetation on Commonwealth Avenue's center island—a major linear segment of Quezon City's vaunted "green lung" for Metro Manila—and its construction has begun to constrict road traffic by removing many of the existing U-turns and narrowing the roadway near the rail stations.

[6] A six percent VMT increased in induced traffic for every 10% road lane capacity increase, and a 10% traffic increase with every three percent land investment increase. The analysis of traffic responses to road investments over five years disclosed "even higher levels of induced demand and induced investment" (Cervero, 2003a, p. 24).

[7] Flyvbjerg's subsequent studies, though, would be more straightforward critiques of infrastructure *Megaprojects and Risk: An Anatomy of Ambition* (2003), a subtitle that resonates with BBB's own *AmBisyon*. AmBisyon Natin 2040 is the slogan of the long-term national vision statement launched by NEDA in 2015.

[8] The UK philosophy of predict and provide is defined by Noland (2007) simply as projecting demand based on population growth, income, and car ownership, and providing road facilities to meet the expected demand. Some commentators note that "transit assignment" has been added to the four-step forecasting model (i.e., the CUBE model), and environmental as well as mobility impacts have been considered. In fact, a new and different model has been employed in two large planning studies in the US recently.

[9] Among other things, Patalinghug (2017) cites DOTr's friction with NEDA, weakness in project analysis and dependence on foreign consultants, and shortage of trained personnel and the absence of an Undersecretary for Planning at that time. Generally, his paper confirms many previous observations about the institutional framework of the land transport sector.

[10] From the international "Sendai Framework" for disaster risk reduction and management. Thanks to Dr. Kristoffer Berse for his tip on where I could locate a source of the slogan, which I had come across somewhere but failed to note down.

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Romeo B. Ocampo† was a retired Professor and former Dean of the National College of Public Administration and Governance, University of the Philippines. He also served as Chair of the Editorial Board of the Philippine Journal of Public Administration.

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In Memoriam

Romeo B. Ocampo (1936–2019)

This issue of the *Philippine Journal of Public Administration* (PJPA) is dedicated to the memory of its editorial board chair, Professor Romeo B. Ocampo, who passed away on 8 February 2019. He first served as chair of the editorial board of the PJPA in 2010 and held the position until the moment of his demise. RBO, as he was fondly known in the NCPAG community, was also the Dean of then College of Public Administration from 1989 to 1992.

RBO joined the NCPAG (then known as the Institute of Public Administration or IPA) in 1959 as a research assistant to Dean Carlos P. Ramos, one of NCPAG's founding fathers. RBO started teaching in 1964 and served as a member of the faculty for four decades until his retirement in 2004 with the rank of full Professor. He taught courses on administrative theory; public policy and planning; urban, regional, and social development; and local and regional government. RBO attended the University of California Berkeley for advanced studies in City and Regional Planning (PhD candidate) and Master in City Planning. He completed his AB English and Master in Public Administration degrees at the University of the Philippines.

In addition to his service as educator and academic, he also held administrative posts in the College, including Director of the Center for Policy and Executive Development, Director of Research and Publications, Director of the Center for Local and Regional Governance, and Dean of the College. A consummate and dedicated scholar, RBO authored numerous journal articles, book chapters, and academic and policy papers published locally and internationally.

In the NCPAG Pillars tribute organized by the NCPAG Library in 2016, RBO was dubbed as a "deliberative mind and ultimate scholar" in recognition of his contributions to the development of the College and the flourishing of Public Administration discourse in the country.

In the essay he penned in 2013 and published in the PJPA in 2018, "Hope: Dealing with Wicked Problems in Government, he wrote: "Though some issues may persist, we may share the hope that the difficult problems that mankind has

faced are soluble and that alternative approaches are available for addressing the scientific, technical, and institutional issues of the social sciences, planning, and public administration… [W]e can hope to overcome even the wicked problems of government and society, though with guarded optimism."

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