



Campaign for Land Use Policy NOW!

LAND USE PLANNING FOR MITIGATION AND ADAPTATION TO CLIMATE CHANGE NOW!

A Policy Paper on the National Land Use Act, Climate Change, and Disaster Risk Reduction

by Gemma Rita R. Marin

The Philippines is an archipelago with more than 7,000 islands. It is no stranger to typhoons, earthquakes, volcanic eruptions and other natural occurrences. In the last two decades, the country has been experiencing more frequent and more devastating typhoons and weather disturbances. The strongest typhoons in recent years such as Sendong (Washi) in 2011, Pablo (Bopha) in 2012 and Yolanda (Haiyan) in 2013 produced torrential rains and gusty winds that have resulted in massive floods and landslides. On the other hand, it has become hotter during the dry season with temperatures rising to above 40 degrees Celsius in some parts of the country. As of May 2015, the Philippine Atmospheric Geophysical Astronomical Services Administration (PAGASA) has reported that 60 percent of the country has suffered drought and dry spell conditions with 31 provinces affected by the drought, and 16 provinces

by the dry spell.¹ PAGASA also advised recently that the current El Niño episode, while weak now, will be a prolonged one and will strengthen toward the end of 2015.²

These changes in the climate have taken their toll on the country's economy and infrastructure. While the government boasts of a booming economy and vigorous implementation of infrastructure projects, this headway is set back every time calamities occur. The damaging effects of climate change

¹ Per PAGASA, drought is defined as 3 consecutive months of way below normal rainfall condition (> 60% reduction from average rainfall) while dry spell refers to 3 consecutive months of below normal rainfall condition (21-60% reduction from average rainfall)

² Dona Z. Pazzibugan, "Long episode of El Niño Seen," *Philippine Daily Inquirer*, May 14, 2015, accessed June 08, 2015. <http://newsinfo.inquirer.net/691248/long-episode-of-el-nino-seen>.



Has the use of land in the country's different cities and municipalities contributed to climate change?

Land Use Planning for Mitigation and Adaptation to Climate Change NOW!

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and disasters translate to loss of lives, outbreak of disease and deteriorating health of the people, and destruction of properties in various parts of the country. Typhoon Sendong, for instance, displaced some 1.2 million persons in 13 provinces in the Visayas and Mindanao, and left more than a thousand persons dead.³ Those affected by Pablo were around five times more than those devastated by Sendong at 6 million persons.⁴ Considered as one of the worst typhoons for all times, super typhoon Yolanda ravaged more than 3 million families and over 16 million persons in similar regions in the Visayas and Mindanao, and parts of Southern Luzon.⁵ Meanwhile the extended and warmer climate has dried up the surfaces destroying vast agricultural lands as well as commercial and industrial businesses. The Philippines is set to import 310,000 tonnes of rice this year in addition to the 500,000 tonnes it has already bought.⁶

Various factors account for climate change. Is the allocation and use of land one of them? Has the use of land in the country's different cities and municipalities contributed to the above-mentioned disastrous effects of climate change? Would there have been fewer occurrences of floods and landslides and less destruction of facilities and infrastructure had there been proper allocation and use of the land? Would we then have saved lives and properties? What land-related measures should have been instituted or are needed to be established to prevent further destruction of the environment, lives and properties?

This policy paper aims to shed light on the phenomenon of climate change and its relationship to land use. It seeks to inquire on how the use of our lands may have contributed to climate change, and how the latter's effects, in turn, have impacted on the country's land and other resources, the ordinary lives and properties of the people. Would a national land use policy that would have guided land use planning and implementation contribute to mitigating or alleviating the disastrous effects of climate change on lives and properties? Specifically for our cities and municipalities, how can land use planning help reduce the risks and dangers caused by the prolonged dry spells or rainfalls experienced in past years? What have been the efforts of the government, civil society organizations and communities to help reduce the risks and dangers posed by climate change, particularly those related to land/land use?

³ SitRep No. 47 re Effects of Tropical Storm "SENDONG" (Washi) and Status of Emergency Response Operations," *National Disaster Risk Reduction and Management Council*, January 26, 2012, accessed June 09, 2015.

⁴ SitRep No. 38 re Effects of Typhoon "PABLO" (Bopha)," *National Disaster Risk Reduction and Management Council*, December 26, 2012, accessed June 09, 2015.

⁵ SitRep No. 108 Effects of Typhoon "YOLANDA" (Haiyan)," *National Disaster Risk Reduction and Management Council*, April 03, 2014, accessed June 09, 2015.

⁶ "PH to import extra rice as El Niño bites," *Manila Bulletin*, May 22, 2015, accessed June 08, 2015, <http://www.mb.com.ph/ph-to-import-extra-rice-as-el-nino-bites/#7QSfAePZcmRhGcjX.99>.



CLIMATE CHANGE 101

President Benigno S. Aquino III, in his speech during the UN Climate Change Summit 2014, said before his fellow world leaders that despite the growth and gains in the Philippine economy in the past decade, the disasters brought about by worsening typhoons and dry spells continue to place the Filipinos in vulnerable situations.⁷ The phenomenon of climate change has been referred to more often when describing the aftermath of recent typhoons experienced in the country. Filipinos themselves confirm that they have been personally experiencing the adverse effects of climate change, and that these impacts are mostly felt by those in Metro Manila.⁸ So what exactly is climate change?

Climate change refers to any change in the climate over time, typically decades or longer. The change may be seen in the form of average temperature or amount of precipitation or in

wind patterns. It may affect one country, one or many regions, or the entire planet Earth.⁹

Causing climate change are natural processes such as solar activity or changes in the sun's intensity, variations in the Earth's orbit, and volcanic eruptions. However, human activities have been found to cause changes in the climate as well. As confirmed by the Intergovernmental Panel on Climate Change (IPCC) composed of some 2,500 scientists from more than 150 countries, human activity is considered largely responsible for the changing climate which, in turn, is setting off the disasters that we encounter today.¹⁰ Every litter thrown, all electrical appliances used, cars and vehicles driven, for every tree that is cut, and the wide fields of agriculture, livestock and fisheries – almost all aspects of our modern lives emit gases through the atmosphere. Methane

⁷ "Speech of President Aquino at UN Climate Change Summit 2014," *Official Gazette*, September 23, 2014, accessed May 21, 2015. <http://www.gov.ph/2014/09/23/speech-of-president-aquino-at-the-un-climate-change-summit-2014/>.

⁸ "First Quarter 2013 Social Weather Survey: 85% of Filipino adults personally experienced the impact of climate change," *Social Weather Stations*, June 25, 2013, accessed May 21, 2015. <http://www.sws.org.ph/pr20130625.htm>.

⁹ "Synthesis Report," In *Climate Change 2007, IPCC Fourth Assessment Report*, accessed May 21, 2015, https://www.ipcc.ch/publications_and_data/ar4/syr/en/mains1.html.

¹⁰ "Summary for Policymakers," In *Climate Change 2007: The Physical Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*, Susan Solomon et al., (eds), (Cambridge and New York: Cambridge University Press, 2007).

Human activity is considered largely responsible for the changing climate which, in turn, is setting off the disasters that we encounter today. Every litter thrown, all electrical appliances used, cars and vehicles driven, for every tree that is cut, and the wide fields of agriculture, livestock and fisheries – almost all aspects of our modern lives emit gases through the atmosphere.

and nitrous oxide, for instance are derived from agricultural activities and piles of waste; carbon dioxide is emitted by coal, oil and natural gas-powered machines and motors; ozone comes out from smoke-belching vehicles; and human-made gases such as sulfur hexafluoride, hydrofluorocarbons and perfluorocarbons are generated from industrial processes and activities. These various gases are released to the atmosphere and interact with the sun's energy, causing some of the heat to be trapped. This process of the heat getting trapped is referred to as the greenhouse effect which is a natural phenomenon that makes the Earth a liveable planet. Accumulation of these greenhouse gases (GHG) over the past two centuries, however, has warmed the Earth's atmosphere to soaring levels that is now known as "global warming".¹¹

The Summary for Policy Makers by the IPCC in its Fourth Assessment Report of 2007 attests that "global atmospheric concentrations of carbon dioxide, methane and nitrous oxide have increased markedly as a result of human activities since 1750...", and that "global increases in carbon dioxide concentration are due primarily to fossil fuel use and land use change, while those of methane and nitrous oxide are primarily due to agriculture."¹² The report elaborated that fossil carbon dioxide emissions emanating from production, distribution and consumption of fossil fuels and as a by-product of cement production have increased in the last two decades from an annual average of 6.4 GtC in the 1990s to 7.2 GtC from 2000 to 2005. The emissions attributed to land-use change were lower at 1.6 GtC annually during the 1990s.

Methane has swelled from 715 ppb during the pre-industrial times to 1,732 ppb in the early 1990s, and slightly higher at 1,774 ppb in 2005. The concentration of methane in 2005 reportedly exceeds the natural range of 320-790 ppb of the last 650,000 years. Nitrous oxide, on the other hand, rose from a pre-industrial value of around 270 ppb to 319 ppb in 2005. Greater amounts of GHG in the atmosphere are yet to be expected as our population increases, agriculture and industry expands, burning of fossil fuels and the emission of other GHGs continue. These will enhance the greenhouse effect, further warming the Earth.

In the end, while one would argue that we cannot really do much on the natural factors contributing to climate change, the silver lining is that much can be done to minimize the causes of climate change spurred by human activity.

¹¹ "What is Climate Change?" Climate Change Commission, Office of the President. Accessed June 10, 2015. <http://climate.gov.ph/index.php/learn-cc/what-is-climate-change#climate-change-101>.

¹² "Summary for Policymakers," 2.



LAND USE IMPACT ON CLIMATE CHANGE AND VICE VERSA

The way we use the land affects the climate”, avers Dr. Gemma Teresa Narisma of the Manila Observatory. Dr. Narisma referred to a research by Argüeso et al. in New South Wales that examined through simulation the impact of urban expansion on the local near-surface temperature or on the minimum temperature (potential coolness) of newly urbanized areas.¹³ The study studied two different areas, i.e., one that has been urbanized and the other as unaltered, to determine the effect of urbanization and climate change on the temperatures. It found that (projected) land use changes can have a strong effect on future minimum temperature that adds to the warming caused by GHGs; specifically, minimum temperature is projected to rise more in new urban areas.

Dr. Narisma built on this finding by citing the Urban Heat Island (UHI) which is primarily caused by the heat-storing structures that increase the heat capacity in the cities. She said that an area warms up and elevates the moisture into

the atmosphere as it becomes urbanized, and tall buildings and other structures rise in place of trees that are cut. The moisture then affects the development of storms, and contributes to the incidence of more intense or widespread rainfall. Once the rains pour, however, there is less soil to absorb the water that runs off as urban centers are already paved. Floods naturally follow. Dr. Narisma calls this situation a “double whammy” for the poor city dwellers especially who, having been pushed to the peripheries with urban expansion, have to suffer the most given intensified amounts and wider areas of rainfall that lead to flooding. This was demonstrated clearly during typhoon Ondoy (Ketsana) in 2009, and two episodes of monsoon rains (*habagat*) in 2011 and 2012.

The City of Valenzuela is one victim of the adverse effects of land use change. Situated in a low-lying area and surrounded by three interconnecting rivers: the Tullahan, Polo and Meycauyan, the city is vulnerable to floods due to high tides and heavy rainfall during the rainy season. Before the 1980s, the farmlands near the rivers were converted into fishponds as pools of water resulted following the rains. In the 1990s, not enough fish was produced in the ponds which were eventually converted into residential subdivisions.

¹³ Daniel Argüeso, et al, “Temperature response to future urbanization and climate change,” *Climate Dynamics* 42 (2014): 2183-99, accessed May 21, 2015, doi: 10.1007/s00382-013-1789-6.

Not only did floods continue due to the paved areas, these land use changes resulted in lower food production, both in quantity and quality, which when sold, turned out to be more expensive.¹⁴

The relationship between land use change and climate change had been examined almost twenty years ago in a study published by the Ecological Society of America. Virginia H. Dale (1997) corroborated that land use and land use changes affect climate change, while the latter manifests its effects on the former. Specifically she wrote, “As a causal factor, land use influences the flux of mass and energy, and as land-cover patterns change, these fluxes are altered. Projected climate alterations will produce changes in land-cover patterns at a variety of temporal and spatial scales, although human uses of the land are expected to override many effects.”¹⁵ Between land use change and climate change though, Dale asserted that the direct ecological repercussions are dominated more by the land use change effects. Inasmuch as climate change is still influenced by land cover patterns, land use practices still determine the alterations on the climate. She further suggested studying the socio-economic and biological implications of land use decisions to arrive at a better understanding of land management strategies (e.g., irrigation) that, in turn, may impact on the various aspects of life within and outside of communities.

Professor Ernesto Serote of the UP School of Urban and Regional Planning (UP SURP), meanwhile, cautions on the creation of more greenhouse gases especially from anthropogenic ways or human activity that take their toll on the climate. He specifically mentions that the sprawling type of development in urban areas unfortunately contributes to the GHG emissions. He illustrates how one person who resides in Fairview, Quezon City and goes all the way to Makati or Alabang in Muntinlupa to work contributes his share to the GHGs emitted by the public transportation that he takes from home to office and back to his home at the end of the day.

In the rural areas, there is the relentless practice of kaingin (slash-and-burn) and deforestation in many parts of the country. Agricultural lands, including prime ones, are carelessly converted into commercial, industrial or residential purposes. Dr. Narisma agrees that these practices and activities accumulate GHG emissions in the atmosphere, and thus aggravate the impact of climate change on the already vulnerable population.¹⁶

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¹⁴ Maple Patrocina Lea C. Mateo and Donna Mitzi Lagdameo, “Building resilience to climate change locally: The case of Valenzuela City, Metro Manila,” *Inside Stories on climate compatible development*, March 2015, Climate & Development Knowledge Network, accessed May 15, 2015. <http://cdkn.org/wp-content/uploads/2015/03/Valenzuela-Inside-Story.pdf>

¹⁵ Virginia H. Dale, “The Relationship Between Land-Use Change and Climate Change,” *Ecological Applications* 7 (1997): 753-769, accessed June 09, 2015, doi: 10.2307/2269433, 753.

¹⁶ Dr. Gemma Teresa T. Narisma (Manila Observatory), interview by Gemma Rita R. Marin, April 21, 2015.



NLUA's FORESEEN CONTRIBUTION IN ADDRESSING THE EFFECTS OF CLIMATE CHANGE AND DISASTERS

A study that underscored the importance of land use planning and management to help mitigate (if not prevent) the consequences of disasters was conducted recently.¹⁷ Having recalled the landslide which occurred in Guinsaugon, Leyte in 2006, it advised the need for a land use plan that is risk-sensitive in light of the numerous disasters encountered in past years, and which involves the participation of the public or communities during planning. It mentioned that effective formulation and implementation of a comprehensive land use plan by local government units can be realized more with the guidance of a national land use policy given the contiguous locations of cities and municipalities.

Guinsaugon, a village in St. Bernard which is a fourth class municipality of Southern Leyte, is situated in an area that is identified as a geo-hazard zone due to the fault lines traversing the mountain range in Guinsaugon and the

adjoining barangays. With steep mountains at its west and a combination of hills and flat terrains at the east, Guisauog's geology is described as "highly porous consisting of sandy clay embedded with loose rock materials and boulders with intense fracturing and weathering, contributing to its instability and susceptibility to mass movements".¹⁸ Hence when continuous rains and a 2.6 magnitude earthquake 21 kms west of Guinsaugon occurred in February 2006, a massive landslide ensued, claiming more than a thousand lives and displacing about 19,000 residents. It took a disaster for the local officials of St. Bernard to undertake a couple of land use actions such as a review of the municipality's land use plans, participatory risk assessment and planning, and trainings on mapping, global positioning system, perimeter survey and formulation of development plans.

The study also cited strategies in land use planning put forward by Emergency Management Australia to minimize

¹⁷ Uy, Noralene, Benigno Balgos and Rajib Shaw. *Guinsaugon, Leyte landslide: Experience and lessons in land use policy*, manuscript, 2015.

¹⁸ Uy, Noralene, et al., *Guinsaugon, Leyte landslide: Experience and lessons in land use policy*, 15.

risk and provide for safer communities, i.e., (1) prohibit development in high-risk areas through zoning and overlay controls; (2) limit the types of development in high to moderate risk areas that are for public use to reduce the potential impacts of disastrous events; and, (3) apply appropriate controls in moderate and lower risk areas such as minimum elevations, setbacks and lot sizes, as well as maximum densities and site coverage.¹⁹

A good illustration of the formulation of a comprehensive land use plan (CLUP) is that of the municipality of Silago in Southern Leyte completed in 2012.²⁰ Using an approach supported by the German Development Cooperation or GIZ called *Sustainable Integrated Management and Planning for Local Government Ecosystems (SIMPLE)*²¹, the local government obtains data initially on the Provincial Development and Physical Framework Plan, which are validated by key members and stakeholders in the community. Discussions between the LGU planning officers and the community stakeholders are facilitated and enriched by other critical inputs and recommendations from experts toward coming up with the comprehensive land use plan, and zoning ordinances.

Among the inputs incorporated into the plan are the municipality's measures for climate change adaptation and disaster risk management. Silago is a coastal town that is prone to natural disasters such as typhoons, storm surge, landslides and floods. The study that documented the land use planning process of Silago recalled the contribution of Manila Observatory which validated that the town was indeed vulnerable to the impacts of climate change. It said,

The study predicts temperature rises in Silago by 2020 and 2050 as well as diminished rainfall. Projected warming is higher inland where most of the forest lands are located, whereas the predicted decrease in rainfall is more severe along the coastal areas where the majority of the rice paddies are currently situated. The combined result of

these two factors is an increased likelihood of drought conditions over extended periods of time with predicted side effects of increased probability of forest fires, less water for irrigation and reduced rice yields, as well as an increase in sea level leading to inundation of rice paddies in proximity of the coast. The study documents that a 4m sea level rise could lead to a 20% loss of the total rice paddy area.²² (See Box I)

Box I. Projected climate change for Silago (Narisma et. al., 2011)

- (a) A slight increase in mean rainfall for the dry season of 2020s and a decrease for all the other seasons; by the 2050s, mean rainfall is projected to decrease throughout the year with up to 25% decline in the dry season;
- (b) As much as 2.2 deg Celsius increase in average temperature which may be expected during the warm dry months (of April & May) during the 2050s;
- (c) Warmer days and warmer nights are anticipated in the 2020s and 2050s. This is indicated by the rightward shifts, i.e. shifts into higher values, in the extremes (the lower and upper tails) of the probability distribution functions of the daily minimum and maximum temperatures;
- (d) Extremely high maximum and minimum temperatures (90th Percentile of the baseline period: 1961 to 1990) could last throughout the year in the 2050s; and
- (e) Consecutive dry days can occur for more than two months with fewer instances of month-long consecutive wet days in the future.

¹⁹ Uy, Noralene, et al., *Guinsaugon, Leyte landslide: Experience and lessons in land use policy*, 2.

²⁰ Annalisa Bianchessi, "The Municipality of Silago, Southern Leyte, Philippines Case Study: A Global Bright Spot for Land Use Planning," *Environment and Rural Development (EnRD)*, German Development Cooperation (GIZ), accessed May 15, 2015, http://www.researchgate.net/profile/Annalisa_Bianchessi/publication/273380530_The_Municipality_of_Silago_Southern_Leyte_Philippines_Case_Study_A_Global_Bright_Spot_for_Land_Use_Planning/links/54ff5a910cf2672e2245e466.pdf

²¹ SIMPLE adopts a top-bottom and bottom-up approach to land use planning. LGUs are enjoined to view and manage the given territory from "ridge to reef", including non-urban areas, into the land use plan. SIMPLE has two pillars namely (1) Ridge to reef planning, and (2) Management and implementation, which are conducted in five phases. The final output of the process is the Comprehensive Land Use Plan or CLUP.

²² Bianchessi, "The Municipality of Silago, Southern Leyte, Philippines Case Study: A Global Bright Spot for Land Use Planning" 29.

As it has been suggested in the Dale study of 1997, this study on Silago then examined the socio-economic attributes in the area to determine the capacity of barangays (villages) to cope with the impacts of climate change. It identified six barangays at high risk from the adverse effects of climate change. Of these, one village posed greater risks owing to the very high population density and number of cases of malnourished children in the area.

Integrating the assessment on climate change impacts has spurred the local government and community planners to identify priority actions in the CLUP, e.g., construction of social housing in the identified relocation sites for settlements, construction or rehabilitation of irrigation systems for production and water provision, and mangrove rehabilitation for environmental management (Refer to Box 2 for a partial list of the priority actions).

Box 2. Partial list of priority actions

Settlements and housing

- Regulation of human settlements in the foreshore areas
- Provision of a relocation site for those houses in disaster prone areas
- Construction of a relocation site for the Local Government buildings as they are currently in a flood prone area in the town proper
- Construction of social housing in the identified relocation sites

Water provision

- Construction of irrigation systems (Hingatungan, Sap-ang, Tubaon, Catmon)
- Rehabilitation of irrigation systems (Salvacion)
- Strict implementation of the Barangay ordinance on the use of water systems to ensure sufficient potable and irrigation water
- Installation and rehabilitation of water pipes from the source up to the connection to counteract the currently insufficient water distribution systems for several villages (Mercedes, Balagawan, Katipunan, Sudmon)
- Provision of a water pump during hot season (Imelda)
- Rehabilitation of canals and drainage to improve the overall drainage (town proper)

Flooding mitigation measures

- Proposed construction of an open and closed sea wall as well as the securing of saline submerge seeds for rice planting to counteract salt intrusion into rice land (Salvacion)
- The replacement of the box “culverts” with a concrete bridge to resolve the issue of flooding (Hingatungan)
- The allocation of funds to construct a drainage system for the village roads

Capacity building and poverty reduction

- Technical training and livelihood support for fishers
- Declaration of closed and open season and fishing regulations to protect declining fish stocks

Improved environmental management

- Mangrove rehabilitation to counteract coastal erosion and provide storm protection
- Information campaign for constituents on the effects of timber poaching to increase flood and watershed protection
- Strict compliance to the EIA protocol to ensure integrity of ridge to reef ecosystems
- Improved infrastructure

On a broader scope, Prof. Serote of UP SURP asserts that “We can employ the land use act to influence the effects of climate change.”²³ He clarifies though that the national policy on land use should be general, encompassing and enabling to allow the issuance of appropriate and case-specific ordinances at the local level.

Knowing that climate change is largely caused by anthropogenic ways or human activity, he shares a couple of strategies on how to mitigate the increasing production of GHGs. Given the sprawling type of development especially in the urban areas as cited earlier, Prof. Serote introduces

the concept of self-containment as the new urbanism where the necessities of the population are confined to a smaller area. It may be called with a new name or branded differently, but it is an old concept. The idea is for a city to undertake a condensed (not sprawling) type of development. He brings out the idea of compactness as against spatial vastness of human activity, as he said, “The more compact the city is, the shorter the travel, and the less fossil fuel you burn.” The needs of the population (work, residence, leisure, etc) are within short-distance from each other. Riding a vehicle hence may not be necessary and the travel time is limited. This way, GHG emissions will be reduced.

²³ Prof. Ernesto Serote (Professor, School of Urban and Regional Planning, University of the Philippines Diliman), interview by Gemma Rita R. Marin, May 04, 2015.



LAND USE-RELATED DISASTER RISK REDUCTION EFFORTS FOR CITY / COMMUNITY PRESERVATION AND RESTORATION

Changes in the climate are prevalent. The damaging effects in our ecosystems and in personal lives and properties for more than two decades are evident. Life-saving efforts, on relief and rehabilitation of communities and/or laws and policies, in the meantime and however belated, have been instituted.

Following the harrowing experience during Ondoy, the Climate Change Act of 2009, and the Philippine Disaster Risk Reduction and Management Act of 2010 were enacted by Congress in no time. These laws made local governments more aware of their fragile situations, and more conscious about their planning activities. Land use planning though leaves much to be desired. In 2012, “according to estimates by HLURB, 70 percent of all municipalities and cities in the Philippines have outdated or no land use plans at all.”²⁴ Unfortunately, there are LGUs which submit plans, if at all,

simply to comply with the law and to immediately get hold of the funds for disaster risk reduction (DRR).

There are illustrative cases though worth citing to make local governments and key stakeholders realize the need for a national framework to guide local land use planning, towards helping prevent unnecessary loss of lives and properties.

City Government of Valenzuela. Valenzuela City was chosen in 2011 as a project area of the Partners for Resilience (PFR) program which is a collaborative effort of five Netherlands-based organizations.²⁵ Aimed at building resilient communities, the program initiated activities that would empower the communities to face the frequent risks they encounter when calamities strike. These included first aid training, contingency planning workshops, community flood drills and formation of solid waste management plans,

²⁴ Bianchessi, “The Municipality of Silago, Southern Leyte, Philippines Case Study: A Global Bright Spot for Land Use Planning” 17.

²⁵ Mateo and Lagdameo, “Building resilience to climate change locally: The case of Valenzuela City, Metro Manila.”

among others. In 2013, the LGU introduced “climate- and eco-smart disaster risk reduction strategies”²⁶ in the city guidelines and protocols. An example is the city’s Greening Project that requires new applications for building permits, businesses, parking lots and residential areas to allocate 20 percent of their area to trees and landscape improvement.

Formulation of the Valenzuela City’s CLUP is currently ongoing. The city already had a CLUP back in 2009, but revisions were necessary to incorporate the relevant provisions of the CC Law and DRR law. In 2014, the DRRMO was officially involved in the drafting of the CLUP to assist in identifying the flood-prone areas in preparation for another zoning ordinance.²⁷ The lack of a national land use policy, however, is making the revision challenging, since there are infrastructure projects (e.g. flood control projects) that traverse more than one city/municipality while each has its own CLUP. The city government is nonetheless resolved to enact measures to enable the city to adapt to or alleviate the worsening effects of yearly disasters. The lack of a national framework or guidelines for land use planning, however, poses difficulties for the city’s own land use planning and disaster risk reduction efforts.

Provincial Government of Albay. As one of the disaster-vulnerable provinces in the Philippines, the provincial government of Albay has incorporated “science-based adaptation strategies” into their CLUP in 2011. Aside from zoning ordinances based on the CLUP, risk mapping was also done to anticipate potential hazards such as earthquakes, volcanic eruptions, and other disasters. With use of the CLUP, zoning, and risk mapping, the Albay government was able to redirect its business centers and residential areas toward safer, less-hazard prone areas.²⁸ These strategies can be likened to the case of Bangkok, Thailand wherein low-elevated coastal areas are not utilized as residential areas but are instead kept as open areas such as parks and recreation centers.²⁹

The above land use planning efforts need to be replicated or to happen on a wider scale. Local governments ought to realize that they are not living in isolation, and any land use decisions that they make have consequences or repercussions on their territory, and on the cities and municipalities that are contiguous to their area. *A broad framework at the provincial, regional all the way to the national level, which a national land use policy will provide, should hence be operative to guide the rational*

allocation and use of land within a city or municipality. Otherwise, with the continuing absence of a national framework, any current or future initiatives or good work in local land use planning and project implementation may be hampered, limited or altogether wasted.

Start Anew, and Think Long-Term

Climate change is here and now. Its distressing and devastating effects are felt by all sectors of society; some more severely than others. Our country has been hit hard by more frequent and more intense natural disasters in the past years and decades, and will continue to be so, including perhaps by the “Big One”. We cannot cease to be vigilant and to prepare for these occurrences. For the short term, disaster preparedness and measures for risk reduction have been instituted to lessen the potential destruction of yearly calamities. While these are worthy and necessary efforts, such short term preparations are not enough. For the long term, enacting the National Land Use Act (now!) and implementing the law properly will translate to appropriate and rational uses of land, and consequently more manageable damage to lives and properties. A national physical framework plan will provide guidelines for land use planning all the way to city and municipal levels by clearly designating appropriate and rational uses of land for protection, production, settlements and infrastructure. With the regulated use of land in a locality, province and region, the gases to be emitted from production (agricultural, commercial and industrial) activities as well as from the cumulative daily activities of families and communities will be contained and managed, if not considerably decreased, with the presence of adequate green and forest covers. Any reduction in emissions into the atmosphere will then translate to a healthier environment and less damaging weather occurrences. Future generations will surely thank us for taking action now!

Pope Francis’s newest papal encyclical titled *Laudato Si’* (or “Praise Be to You”) is very timely. He cites environmental degradation and climate change, and their adverse effects particularly on the poor and marginalized people. He warns of continuous destruction of the ecosystems and the serious consequences on everyone *if corrective action is not taken swiftly*. At a news conference at the Vatican, Cardinal Peter Turkson said, “Humanity is faced with a crucial challenge that requires the development of adequate policies also being discussed on the global agenda... Certainly, *Laudato Si’* can and must have an impact on importance and urgent decisions to be made in this area.”³⁰

²⁶ Mateo and Lagdameo, “Building resilience to climate change locally: The case of Valenzuela City, Metro Manila,” 3.

²⁷ Dr. Arnold Antonio (Disaster Risk Reduction and Management Office, City of Valenzuela), interview by Gemma Rita R. Marin, May 11, 2015.

²⁸ Joey Sarte Salceda. *Adapting to Climate Change: Strategies of Albay, Philippines. Agriculture and Development Notes on Climate Change Adaptation.*

²⁹ Dr. Gemma Teresa T. Narisma (Manila Observatory), interview by Gemma Rita R. Marin, April 21, 2015.

³⁰ Jim Yardley and Laurie Goodstein. “Pope Francis, in Sweeping Encyclical, Calls for Swift Action on Climate Change.” *The New York Times*, accessed June 18, 2015, http://www.nytimes.com/2015/06/19/world/europe/pope-francis-in-sweeping-encyclical-calls-for-swift-action-on-climate-change.html?hp&action=click&pgtype=Homepage&module=second-column-region®ion=top-news&WT.nav=top-news&_r=1

The Pope thus hopes that the encyclical will influence energy and economic policy, and stir movements all over the world. He framed the encyclical as a call to action. For one, he expects the bishops and priests to lead discussions on the encyclical during Sunday mass and services. He also calls on the ordinary people to exhort politicians to effect policy changes. As Pope Francis writes, "All is not lost. Human beings, while capable of the worst, are also capable of rising above themselves, choosing again what is good, and making a new start."³¹

³¹ The Holy Father Francis, *Laudato Si'*, Encyclical Letter on care for our common home, Vatican Web site, June 19, 2015, 59, http://w2.vatican.va/content/francesco/en/encyclicals/documents/papa-francesco_20150524_eniclicala-laudato-si.html



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