

# Human Insecurity and Conflict: Effect of Coastal Communities' Vulnerability to Climate Change

Teresita G Montaño and Aurora C. Gonzales

**Abstract**—The study illustrated how changes in climate contribute to insecurity and conflict. High levels of environmental vulnerability, poor natural resource management, and limited livelihood options, increases the risks of insecurity and conflict. The data was gathered through: a) survey; b) focus group discussions and c) key Informant interview. The areas included in the study have shown environmental changes such as long periods of drought, high temperature, flooding, long duration of precipitation and unpredictable weather changes. Barangay officials need to strengthen the community's strategy in addressing the risks of climate change. Livelihood options and economic conditions are affected due to these climatic events. The respondents' livelihood is natural resource dependent, like fishing and farming. The loss of livelihood and the opportunity to find other employment is resulting from the low educational attainment and lack of alternative livelihood. This made the community susceptible to experiences of conflict and human insecurity. It can be concluded that the economic condition of the members of the community is affected due to the risks experienced from changes in the weather; these circumstance heightened the conflicts which may be considered as directly or indirectly due to the result of climate change.

**Index Terms**—Human insecurity, conflict, climate change.

## I. INTRODUCTION

Why is climate change a human security issue? Most political and scientific communities worldwide are now recognizing that the world will not be spared from the effects of climate change, and that this could result to significant environmental changes. While scientists and policy-makers exert so much effort in mitigating or slowing down the impact of climate change, it is acknowledged that we already surpassed the "point of no return" and that some consequences are inevitable [1]. With this foreseen danger, many studies were conducted to provide a deeper and comprehensive understanding on this looming ecological crisis. However, most of these researches focused on the ecological, economic, and health aspects. For instance, the Intergovernmental Panel on Climate Change [1] Fourth Assessment Report looked mostly at environmental consequences, though it also considered the impact on human health and on 'industry, settlement and society'.

Going beyond these areas of concern some policy-makers and researchers started considering how environmental

changes caused by climate change might in turn affect peace and security. For the last couple of years a number of reports have been published suggesting that climate change may have negative impacts on conflict and security dynamics in many parts of the world. A report by the German Advisory Council on Global Change [2] argued that, "without resolute counteraction, climate change will overstretch many societies' adaptive capacities within the coming decades. This could result in destabilization and violence, jeopardizing national and international security to a new degree". This view was affirmed by International Alert [3] when it concluded that 'there is a real risk that climate change will compound the propensity for violent conflict which, in turn, will leave communities poorer, less resilient and less able to cope with the consequences of climate change'.

Linking climate change with conflict and security is relatively a new undertaking. It is difficult to pinpoint exactly how climate change will affect conflict and security dynamics. First, it remains uncertain exactly what environmental changes will take place. Second, violent conflict is a complex reality and has various factors or causes. The interplay also between these factors in any given situation will be impossible to predict with total certainty. Nevertheless, researchers have suggested that "various forms of insecurity may become more prevalent in areas affected by climate change, leading to more crime and a greater risk of violent conflict" [4].

Junio *et al.* 2014, mentioned that climate change is already affecting the physical security of vulnerable communities particularly in fragile and conflict-stricken countries [5]. The use of conflict-sensitive approach is very important especially in addressing climate change by policy makers and practitioners. This kind of approach can uphold a non-violent progressive adaptation strategies, which can help in building resilience to climate change and conflict [3]. It is also important to note that climatic events and environmental conditions such as water scarcity, unpredictable weather, drought, flooding, land degradation and many others may indirectly be the cause of insecurity and conflict.

The possible occurrence and the intensity of insecurity and conflict greatly depend on the adaptive capacities of the communities to manage human activities preventing the prevalence of conflict. In this context the role of governance and human security plays a very vital role. Junio *et al.*, 2014 [5] added that a conflict sensitive approach in the development and implementation of public policies on climate change issues and the promotion of early warning systems in the field will allow for more constructive approach in dealing with the conflict and will prevent future ones to happen.

Manuscript received December 6, 2017; revised April 23, 2018.

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To further discuss, climate change is a human security issue. Human security in this context is referred to the people's "safety from chronic threats and protection from sudden hurtful disruptions in the patterns of daily life." There are seven types of security as components of human security namely: economic security; food security; health security; environmental security; personal (physical) security; community security; and political security. This research endeavor focus on human security and some conditions related to climatic changes that may directly or indirectly affect communities.

The impact of climate change on resources and communities worldwide is a given fact. This environmental trend may increase the unpredictable peace and security situation of the city. The City of Zamboanga is 850 kilometers south of Manila and in the southernmost part of the Zamboanga Peninsula. It is surrounded by irregular coastlines with generally rocky terrain with occasional stretches of sandy and gravelly beaches, found in the southwest and eastern part of the city. The coastal profile usually depends abruptly towards the sea. The City of Zamboanga has a total of 98 barangays, and roughly 30 of these barangays are located along the coastal area and are generally coastal resource dependent for food and livelihood. Zamboanga's coastal zone provides a diverse range of natural resources and favorable conditions for social and economic development.

In addition, it has been cited in the Zamboanga Peninsula Regional Development Plan 2011-2016 [6] that the frequent disaster occurrences in the Zamboanga Peninsula region from 1999-2009 are usually hydraulic hazards, particularly flooding, storm surge, and flash floods. The region also ranked second in terms of the largest land area most susceptible to a one meter sea level rise.

This study is Phase II of the project jointly conducted by the Commission on Higher Education (CHED), the Ateneo de Zamboanga University, Research Center, and specifically with the help and assistance of the five coastal barangays included in the study. This research endeavour tried to identify coastal communities that are highly vulnerable to climate change, the climate change issues experienced by the 5 coastal barangays and how these climate issues affect peace and security. This research verified how livelihood options and economic conditions contributed to the conflict and human insecurity among members of the community. Furthermore, this study consolidated adaptive strategies that can pre-empt or mitigate the threat of violence brought about by environmental vulnerability and irresponsible natural resource management.

## II. METHODOLOGY

This study used the mixed method, field research work was conducted in potential new growth centers identified by the local government unit which are located in the coastal areas of Zamboanga City. Data collection was carried-out through barangay profiling, survey, focus group discussions and key informant interviews with members of the local communities and stakeholders included in the study.

Scoping was conducted to identify the communities that

have high level of environmental vulnerability due to climate change. The communities have also been pre-qualified using the data results of the study entitled "Mapping the Vulnerable Sectors in the Coastal Areas of Zamboanga City", (Phase I, HERRC Research Project of AdZU funded by the Commission on Higher Education, CHED)). The environmental vulnerability of the 5 coastal barangays have already been shown in the mentioned research. The scoping mentioned here therefore, was used to validate the final identification of the 5 coastal barangays included in the study.

Household survey was used to gather the data from the five coastal barangays to determine how the livelihood options and economic conditions contributed to insecurity and conflict among members of the community. Items in the survey questionnaire was crafted based on the results of the focused group discussion (FGD) conducted separately in the five coastal barangays that were chosen.

Key informant interviews (KII) were conducted to validate some of the information derived from the focused group discussions and household survey.

## III. STUDY AREA

This study was conducted in five selected coastal barangays of Zamboanga City. The choice of the coastal barangay was based on the previous findings that flooding and landslides was perceived to be the most widespread direct risk to human settlements due to the projected increase in precipitation and sea level rise. Since Zamboanga City is located at the tip of the Zamboanga Peninsula and is bounded by the sea on both sides, the probability that medium or highly populated coastal barangays will be affected by sea level rise and the volume of water during flooding episodes will be relatively high.

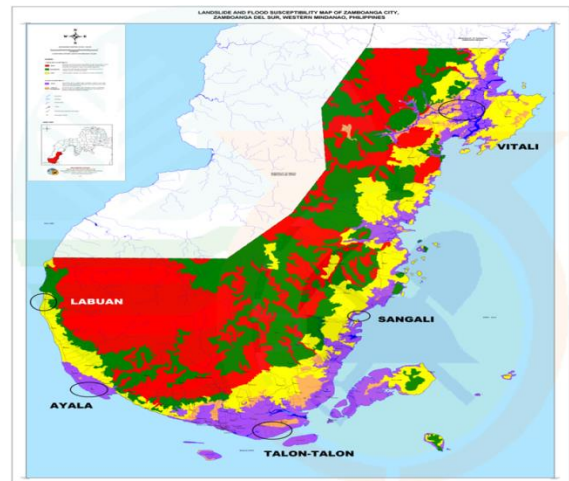


Fig. 1. Landslide and flood susceptibility map of Zamboanga city (Mines and Geosciences Bureau IX 2014).

Hence, the areas of study are the four barangays of the five new economic growth centers namely Labuan, Ayala, Sangali, and Vitali [7]. Barangay Talon-Talon was also included in the study, though not considered to be a new growth center however, it is an aquaculture-based economy, densely populated and a barangay that is nearest to the city proper. The geohazard map of Zamboanga City (Fig. 1)

illustrates the environmental vulnerability of the chosen areas of the study. The map below shows the location of the five (5) coastal barangays namely Vitali, Sangali, Talon-Talon, Ayala and Labuan.

#### IV. RESULTS AND DISCUSSION

“Does climate change really cause conflict?” There are researchers who agree that climate change can intensify human conflict. Though there are others who are in contrast to the claim that it is the coils of human conflict. It is also notable that humans have fought for ages over resources. This research endeavor illustrates how changes in climate contribute to insecurity and conflict. It is explained that the community’s high levels of environmental vulnerability with a combination of poor natural resource management, and limited livelihood options, increases the risk of insecurity and conflict that is arising from climate change. To further discuss, the following are presented in this paper: (a) environmental vulnerability experienced by the five communities; (b) their livelihood options and economic conditions; (c) conflict experienced that is related to climate change; and (d) the adaptive strategies of the barangays that can mitigate the threat of violent conflict.

##### *A. Environmental Vulnerability Due to Climate Change*

This paper identified five (5) communities in Zamboanga City that have high level of environmental vulnerability due to climate change. These communities are Barangays Vitali and Sangali in the east coast; Talon-Talon within the city proper; and Ayala and Labuan in the west coast. In the past, three of these communities, namely: Ayala, Labuan and Vitali have experienced long period of drought/dry spell in the 1990s. It was also mentioned that their crops have been greatly affected by pest problems that were brought about during warmer temperature [5]. Just recently, during the focused group discussions that were conducted, the respondents coming from the five barangays have shared that the 2015 drought has affected their livelihood tremendously. In addition, they also mentioned that they have experienced tension and conflict within the family and neighbourhood.

Over the past 5-10 years the top five climate change issues experienced by the respondents were as follows: long duration of drought, the hot temperature, long duration of precipitation, flooding and unpredictable change of weather. The most recent was the 2015-2016 drought/dry spell that has been experienced by the communities which ranked the highest. It is important to note that the recently released Special Report of the Intergovernmental Panel on Climate Change on Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation [8] only focuses on dryness indicators, which are very different from an agricultural or hydrological drought. Further, IPCC [8] concludes there is only ‘low confidence in attribution of changes in recent drought at the level of single regions’ and ‘low confidence’ in the projected changes to the magnitude and frequency of future droughts due to insufficient agreement amongst the climate models.”

During the prolonged dry spell or drought in Syria from the 2007 to 2010, it has been reported that it caused an

extensive crop failure which lead to a massive migration of communities and families to urban centers. It was one of the worst impacts of drought recorded in history. In the present-day studies, it indicated that the civil war in Syria has been linked with the severe drought they experienced. Moreover, in this case certainly climate change amplified the risks. The intensified droughts and other drastic occurrences caused price hikes in basic commodities like food [9].

The impact of climate change to the community is very severe. It was enumerated during the focused group discussions, that the impact of these environmental changes to the community affected not only the relationship among family members but with neighbors as well. They accounted that conflict in relationship occurred in instances when some members of the community would steal their harvest and or encroach on their farm lands. In addition, the participants mentioned that due to the scarcity resulting from the hazards of climate variations, neighbors would result to borrowing money, rice and other commodities to support the needs of their family. These when not paid as promised became irritants that caused tension/conflict with their neighbors.

##### *B. Livelihood Options and Economic Conditions of the Barangay*

This research endeavored to determine how livelihood options and economic conditions contributed to the conflict and human insecurity among members of the community. It is good to note that the livelihood options of the five coastal barangays included in the study are primarily dependent on natural resources.

The top 3 livelihood sources are: fishing including buy and sell, wholesale and retail and rice farming and other crops,. In the survey that was conducted the respondents did not indicate their sources of livelihood. They mentioned that they do have permanent sources of income. This indicates that a majority of the community members do have permanent sources of income however it can be highly sensitive to the changes in climate and that the economic options of the community is closely reliant on coastal and agricultural resources. The information relates with what was mentioned in this study, according to IUCN 2009 [10], those communities that are highly diverse and contain a range of industry types as well as use resources from a broad base can be expected to be less sensitive to climate.

The Philippine archipelago is not spared from the adverse impacts of extreme climate events that are expected to happen in warmer parts of the globe. The Philippines is considered as one of the climate hotspots, according to Jabines and Inventor [11]. This is largely attributed to its geographical features; that is archipelagic in nature. In addition, the low level of economic development and exposure is exacerbated by poor access to resources. The massive long period of dry spell and drought that hit many parts of Mindanao in 2015, brought severe losses to crop and livelihood of farmers. These areas have a long history of drought experience and incidence of food-stock looting and raiding especially during crisis moments. The farmers during the 1990 ran off with 500 sacks of rice from the National Food Authority (NFA) warehouses in Roxas town, Arakan Valley. There were also cases in 1993, wherein farmers from

drought-stricken communities in Columbio, Sultan Kudarat took 3,000 sacks of rice from an NFA warehouse. The starving families from Matalam, North Cotabato, in 1998 were joined by Moro rebels who threatened to ransack NFA warehouses if their need for food was not addressed. The series of environmental changes that hit this side of Mindanao amplified the risks that the communities are experiencing. And just recently, the drought of 2016 brought bloodshed and the lives of innocent farmers in the Kidapawan tragedy were no spared. Mindanao has a long history of catastrophes, which in a way brought hunger and insecurity [12].

### *C. Conflict Experience of the Communities Related to Climate Change*

The type of conflict experienced by the respondents of the five barangays can be categorized as minor conflict. It was observed that marital conflicts and disputes with neighbors are the two top most conflicts the community are faced with. Lending/loan conflict and stealing of properties are minimally mentioned by the respondents. However, this was mentioned as one of the causes associated with conflict in the neighborhood. Although the conflicting events observed can be considered as minor conflicts, these should not be ignored because bigger conflicts usually happen as the product of accumulated series of similar events. The case of the 2016 Kidapawan incident is a typical example. It has been cited by Lara [12] that the farmers were already affected by the environmental changes since the 1990s. The bloodshed in Kidapawan did not happen merely due to the climatic episode of that year but it was the product of a long period of difficulty and exposure experienced by the farmers and their families due to climactic events like long drought/dry spell.

In a research study conducted by Gleik [13] he described that “water and climatic conditions have played a direct role in the deterioration of Syria’s economic conditions. There is a long history of conflicts over water in these regions because of the natural water scarcity, the early development of irrigated agriculture, and complex religious and ethnic diversity. In recent years, there has been an increase in incidences of water-related violence around the world at the sub-national level attributable to the role that water plays in development disputes and economic activities “.

The data shows that the respondents are in conflict due to financial crisis and no permanent livelihood when exposed to changes in climactic conditions. The data does not show the direct link between climate change and conflict but the climactic changes contribute to the loss of livelihood or financial crisis that resulted to marital conflict and disputes with neighbors. It is also shown that the respondents are exposed to the lack of water supply. As revealed by the respondents, the lack of water affected their farmlands and the volume of harvest thus, their finances and ability to meet the needs of their family was greatly affected.

The changes in climate conditions like extreme temperature also contributed to health problems such as increased incidence of high blood pressure and skin diseases among members of the family. These compounded the problem of lack of income thus, resulted to conflict within the family. The conditions earlier mentioned were deemed as

some of the reasons why minor conflicts were observed to happen in the communities included in this research study particularly during long periods of drought and extreme temperature/weather conditions.

### *D. Adaptive Strategies That Can Mitigate the Threat of Violent Conflict*

This paper operationally presents adaptive strategies of the barangay as to how they respond to the human security issues that is related to climate change. The community actors are one of the key players that can help mitigate the possible violent conflict which may have resulted due climate changes. They are the ones directly or indirectly responsible in preparing the community to respond to the possible impacts of climate change and to human insecurity. In addition, these actors when operational and functional can help prevent the possible threat of climate change in the lives of the community members.

This paper seeks to present the identified five communities that are considered to have a high level of environmental vulnerability due to climate change. Furthermore, it will also be discussed in this research how environmental vulnerability, livelihood options and economic conditions contributed to the conflict/ peace and security among members of the community; and suggest adaptive strategies that can prevent or mitigate the threat of violent conflict brought about by environmental vulnerability and inefficient management of natural resources.

The five barangays that were identified to have high environmental vulnerability are Vitali and Sangali in the east coast; Talon-Talon near the city proper; and Ayala and Labuan in the west coast. These barangays are confronted with various environmental threats like the long period of drought, hot weather/temperature, flooding, long duration of rain and unpredictable weather condition. These climatic events affected not only their families but their communities as well. The barangay leaders need to strengthen the community’s strategies in responding to the possible occurrence of risks, due to climatic changes, that will hamper the livelihood and economic conditions of the community members. These actions will prevent possible conflict or a sense of insecurity among the members of the community.

The community’s exposure to the different environmental occurrences determines how vulnerable they are. As cited by the respondents, the communities were greatly affected by the 2015 long dry spell. The drought has caused a lot of damages not only to livelihood but also to family and community relationships. It has also been found in this study that the conflict and human security issue experienced by the community members do not point directly to climate change but seen as a consequence due to the effects of climate change.

The livelihood options and economic conditions of the five coastal barangays were affected by climactic events. Majority of the respondents’ livelihood are natural resource dependent, like fishing and farming. The loss of livelihood and lesser opportunity to find other work is caused by the poor educational attainment and fewer availability of alternative livelihood. These lead the community susceptible to experiences of conflict and human insecurity. It can be

concluded in this study that the economic condition of the community can heighten the possible risks of conflict which may be a direct or indirect result of climate change.

The study found out that there are available structures and resources in the community which when mobilized and utilized can help in responding to the risk of conflict possibly resulting due to climate change experiences. Strengthening and maximizing the roles of the barangay Leaders as key community actors can do so much in mobilizing the community to respond effectively to human insecurity and conflict. It was also observed that livelihood, infrastructure and resources are available in the community and most of these resources are related to farming and fishing livelihood options.

## V. CONCLUSION

The high level of environmental vulnerability of the communities to climate change affected the livelihood and economic conditions of the constituents. Furthermore, the inefficient management of natural resources in the community also contributed to the community's environmental vulnerability. The data have clearly shown that there are insecurity and conflicts experienced by the community members during climatic events like long duration of drought, hot weather/temperature and flooding to name a few. The community also cannot directly associate conflict as a result of climate change. Although, the respondents have observed that during warmer weather/temperature due to scarcity of water to be used for both domestic and agricultural needs, there is high incidence of marital conflict and disputes among neighbors. It is safe to say that human insecurity and conflict cannot be directly equated to Climate Change but the result of household and economic difficulties experienced by the community and family members resulting from the community's vulnerability to climate change.

## ACKNOWLEDGEMENT

This study was conducted by the Ateneo Research Center of the Ateneo de Zamboanga University with support from the Commission on Higher Education (CHED).

## REFERENCES

- [1] (2001). Climate change: Impacts, adaptation & vulnerability. *Intergovernmental Panel for Climate Change*. [Online]. Available: <http://www.ipcc.ch>
- [2] (2007). World in transition: Climate change as a security risk. *German Advisory Council on Global Change*. [Online]. Available: [www.wbgu.de](http://www.wbgu.de)
- [3] D. Smith and J. Vivekananda, "A climate of conflict: The links between climate change, peace and war," *International Alert*, 2007.
- [4] (2009). Climate change and security in Bangladesh: A case study. *Bangladesh Institute of International and Strategic Studies and Saferworld*. [Online]. Available: <http://mercury.ethz.ch>
- [5] J. Regina *et al.*, "Mapping the vulnerable sectors in the coastal area of Zamboanga city," The Ateneo de Zamboanga Research Center, June 2014.
- [6] Zamboanga Peninsula Regional Development Plan 2011-2016. National Economic and Development Authority. [Online]. Available:

[http://www.neda.gov.ph/wp-content/uploads/2013/10/RegIX\\_RDP\\_2011-2016.pdf](http://www.neda.gov.ph/wp-content/uploads/2013/10/RegIX_RDP_2011-2016.pdf)

- [7] City Development Strategies Full Report, Zamboanga City, Asia's Latin City, February 2007.
- [8] Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation. Special Report of the Intergovernmental Panel on Climate Change. [Online]. Available: [https://www.ipcc.ch/pdf/special-reports/srex/SREX\\_Full\\_Report.pdf](https://www.ipcc.ch/pdf/special-reports/srex/SREX_Full_Report.pdf)
- [9] Address by Minister Dion at the climate change in fragile states, March 30, 2016.
- [10] N. A. Marshall, P. A. Marshall, J. Tamelander, D. Obura, D. Malleret-King, and J. E. Cinner, "A framework for social adaptation to climate change," December 2009.
- [11] A. Jabines and J. Inventor, "The Philippines: A climate hotspot. Climate Change Impacts and the Philippines." Greenpeace Southeast Asia, Climate and Energy Campaign, 2007.
- [12] L. Francisco, "Bloodshed in Kidapawan: Climate change, conflict, politics of famine," 2016.
- [13] H. Gleik, "Water, drought, climate change, and conflict in Syria," Pacific Institute, Oakland, California, Add to Favorites Track Citation Download Citation Email, 2013.



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