Private Sector Engagement in Climate Change Mitigation and Adaptation: Implications in Regional Governance*

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Abstract

Climate change is a global phenomenon that affects the economies and socio-cultural, ecological and other vulnerabilities of countries. Thus, governments around the world have started to comprehensively address the challenges of climate change through National or Regional or International Climate Change or Disaster Risk Mitigation and Adaptation Action Plans. These Plans often provide key actions that enhance the adaptive capacity and resilience of communities and natural ecosystems to climate change. In addition, these also adopt economic and other valuation of natural resources that to a certain extent, ensures biodiversity conservation.

These Plans also provide for a policy environment that encourages the participation of the private sector in adaptation and mitigation towards sustainable development. This paper thus aims to review some of the private sector initiatives in among others, building Sustainable Energy, encouraging Climate-Smart Industries and Services and in other support initiatives for climate change mitigation and adaptation. The review will cover private sector engagement in the Philippines and other countries (where information may be available), with the end in view of analyzing constraints and opportunities in maximizing their participation.

This paper may be instructive of the next steps to harness the private sector in climate change adaptation and mitigation.

This will be mainly done through desk review of plans, programs, materials and related literature on the topic at hand.

Keywords: Climate Change/ Adaptation and Mitigation/ Private Sector Engagement

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Climate Change, the ASEAN and the Philippines

1. Climate Change as a Development Issue

The biggest and the most imminent challenge that Southeast Asia faces today is climate change (AFAB Coalition, 2014)[1].

Climate change is a global phenomenon that affects the economies and socio-cultural, ecological and other vulnerabilities of countries. Being a development issue (World Bank 2010) and not merely an environmental concern, climate change has become a defining and most challenging sustainable development issue of the twenty first century (Letchumanan, 2013).

It is defining in the sense that it is now dictating the pace and nature of economic growth, development and social progress, while potentially becoming the greatest threat to humankind and survival if left unchecked. It is challenging because of its multifaceted nature, affecting almost all sectors and the basic means and lifestyle of human existence (Ibid. p. 2). In seconds, climate change may wipe out communities and the gains of development, economic or otherwise. It does not discriminate against rich or poor; developed or developing country. It affects everyone that comes along the disaster's path.

Climate change refers to the state of the climate that can be identified (e.g., by using statistical tests) by changes in the mean and/or the variability of its properties and that persists for an extended period, typically decades or longer. Climate change may be due to natural internal processes or external forcings, or to persistent anthropogenic changes in the composition of the atmosphere or in land use (IPCC, 2012). Its more obvious manifestations include rising temperature, variability of precipitation, frequency and intensity of typhoons, rise in sea levels, and the risks of more droughts, floods, heat waves, and forest and grassland fires and other disasters (CCC, 2011).

According to the 2014 World Bank Development Report, the Southeast Asian region has experienced decrease in poverty incidence, measured by the percent of people living below $1.25 a day in the past 20 years (Figure 1). This indirectly mirrors progress in economic growth, which may have been eroded to some extent by the number of natural disasters, which include droughts, earthquakes, floods and tropical storms, that came to its path during the same period (Figure 2).

In fact, of all the regions in the world, Asia, particularly the area of the Association of Southeast Asian Nations (ASEAN)- member states is most prone to disasters (Sawada and Oum, 2012). With agriculture-based economies and dependence on natural resources, and with the bulk of its populations and economic activities concentrated along coastlines, it is among the most vulnerable and least prepared area to face this global crisis.

[1] *AFAB stands for ASEAN for a Fair, Ambitious and Binding Global Climate Deal. Accessed at AFAB on Twitter, http://a-fab.org/climate-change/ September 23, 2014.*

Fig. 1. Incidence of Poverty Across the World

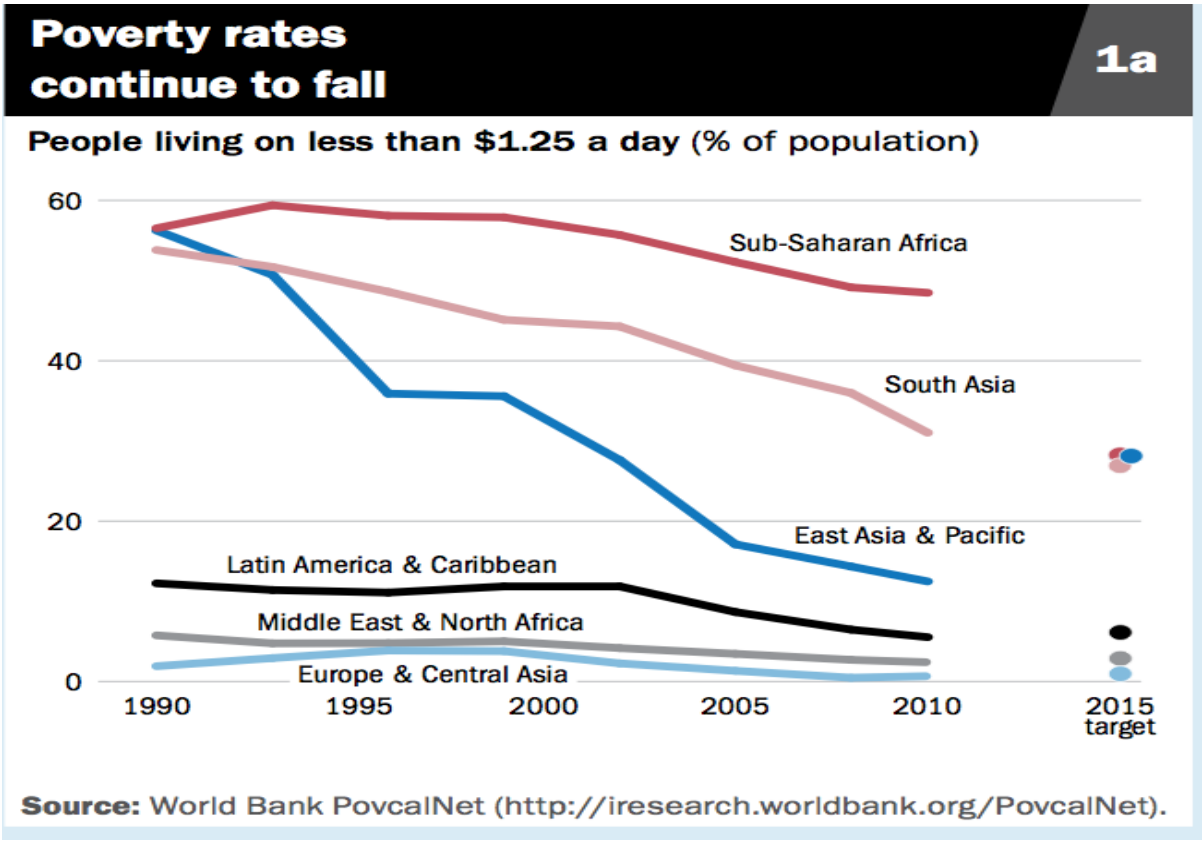
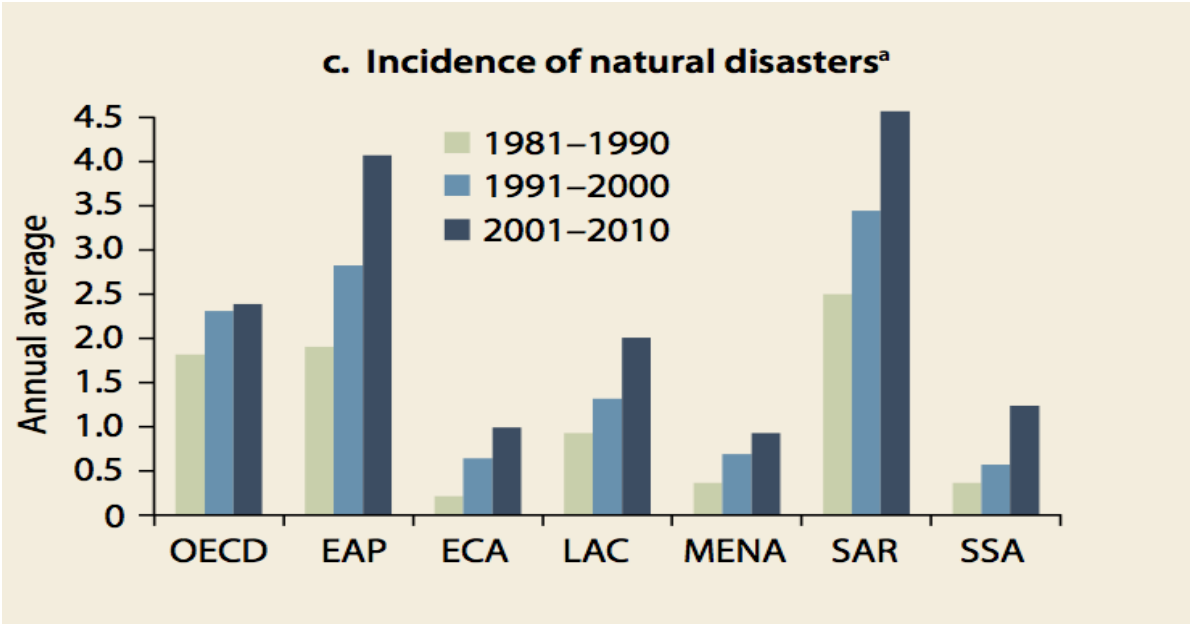


Fig. 2. Incidence of Natural Disasters Across the World



Source: WDR 2014 and EM-DAT OFDA/CRED International Disaster Database, p. 26.

2. Effects on the ASEAN

Climate change impacts are already being felt across the region. Extreme weather events such as typhoons are now more frequent and more intense, causing catastrophic landslides and floods. Prolonged and more frequent droughts lay agricultural areas and forests wasted, as well as compounding water stress (AFAB, 2014).

In addition, the geophysical and climatic conditions shared by the region have also led to common and trans-boundary environmental concerns such as air and water pollution, urban environmental degradation and trans-boundary haze pollution (Letchumanan, 2014).

Increased temperatures are damaging marine resources. And rising sea levels are slowly encroaching on populated coastlines, damaging freshwater reserves. Minus emissions from deforestation, the rapid pace of industrialization in the leading economies of Southeast Asia (Thailand, Indonesia, Philippines, Malaysia, Vietnam and Singapore) also makes the region the third largest contributor of greenhouse gases in Asia (AFAB, 2014).

Together with emissions from deforestation, unchecked forest fires and increasing uptake of dirty energy such as coal fired power plants, it is estimated that the total emissions from Southeast Asia could account for as much as 21% of total global greenhouse gas emissions in the next five years (AFAB, 2014).

Asia suffered the brunt of the most number of disasters[2] per year (49% of total in the world) affecting more than 200 million people annually and causing more than USD 41.6 billion in damages annually (Sawada and Zen 2014; see Table 1). The disaster picture for the ASEAN in terms of natural hazards like flood, storm, tsunami and others, is shown in Table 2 below.

2 In general, disasters can be classified into four major groups (Sawada, 2007). The first type is natural disasters, which consist of hydrological disasters (floods), meteorological disasters (storms or typhoons), climatological disasters (droughts), geophysical disasters (earthquakes, tsunamis and volcanic eruptions), and biological disasters (epidemics and insect infestations). The second type of disasters is technological disasters, i.e., industrial accidents (chemical spills, collapses of industrial infrastructures) and transport accidents (by air, rail, road or water means of transport). The final two disasters are manmade which include economic crises (hyperinflation, banking crisis, and currency crisis) and violence (terrorism, civil strife, riots, and war)(As cited in Sawada and Zen, 2014). For this paper, only the natural disasters will be covered.

Table 1: Natural Disaster Occurrence and Impacts: Regional Figures (Average from 2001 until 2010)

(1) Number of Natural Disasters per Year

	Africa	Americas	Asia	Europe	Oceania	Global
Climatological	9	12	11	17	1	50
Geophysical	3	7	21	2	2	35
Hydrological	44	39	82	24	6	195
Meteorological	9	34	40	14	7	104
Total	65	92	153	58	16	384

Data: Annual Disaster Statistical Review 2011, CRED, IRSS & UCL, 2012.

(2) Number of Victims per Year (in millions)

	Africa	Americas	Asia	Europe	Oceania	Global
Climatological	12.29	1.22	63.45	0.27	0.00	77.23
Geophysical	0.08	1.02	7.77	0.01	0.04	8.92
Hydrological	2.18	3.31	100.82	0.35	0.04	106.70
Meteorological	0.35	2.72	35.88	0.11	0.04	39.10
Total	14.91	8.27	207.92	0.74	0.12	231.95

Data: Annual Disaster Statistical Review 2011, CRED, IRSS & UCL, 2012.

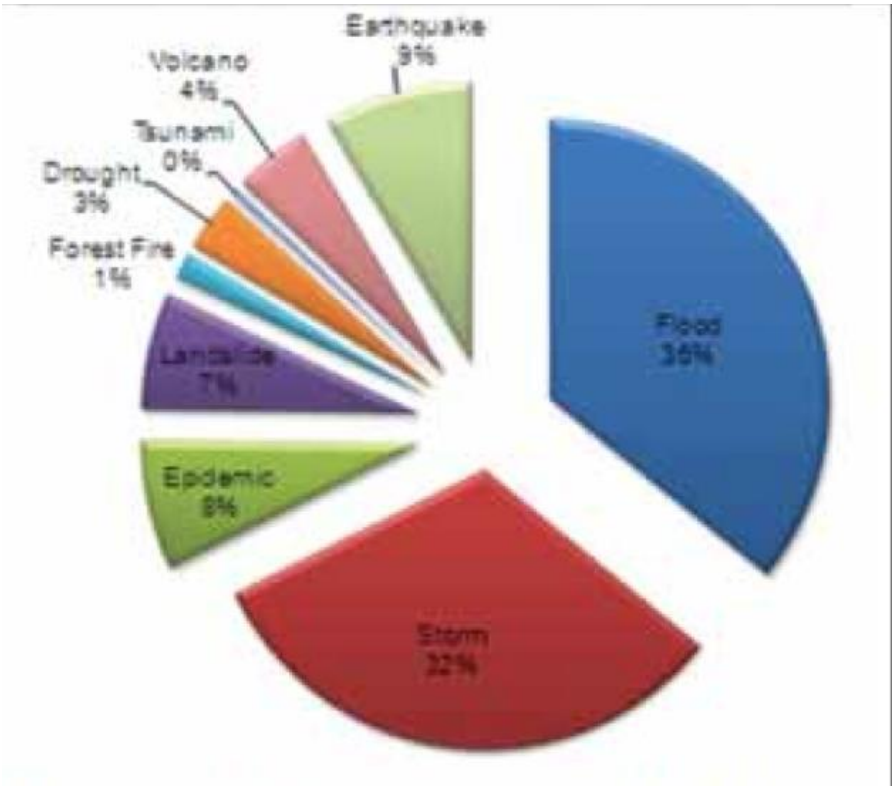
(3) Damages (in USD Billions)

	Africa	Americas	Asia	Europe	Oceania	Global
Climatological	0.04	1.90	3.45	3.23	0.48	9.10
Geophysical	0.69	4.75	17.38	0.57	0.69	24.08
Hydrological	0.28	3.15	11.15	5.57	1.24	21.39
Meteorological	0.08	40.47	9.62	4.03	0.56	54.77
Total	1.10	50.27	41.61	13.40	2.97	109.35

Data: Annual Disaster Statistical Review 2011, CRED, IRSS & UCL, 2012.

Table 2. Disaster Risk Statistics in ASEAN, 1970-2009

Disaster Risk Statistics (1970-2009)				
Disaster type	*No. of disasters / year*	*Total no. of deaths*	*Deaths / year*	*Relative vulnerability (deaths/year / million)*
Flood	10.85	17,800	445.0	0.75
Storm	9.65	184,063	4,601.6	7.76
Epidemic	2.28	7,294	182.4	0.31
Landslide	2.05	5,058	126.5	0.21
Forest Fire	0.45	310	7.8	0.01
Drought	0.98	1,337	33.4	0.06
Tsunami	0.15	92,021	2,300.5	3.88
Volcano	1.33	1,380	34.5	0.06
Earthquake	2.58	105,735	2,643.4	4.46



Source: UNISDR and World Bank 2010

A recent Climate Change Vulnerability Index (CCVI)[3], released by the global risks advisory firm Maplecroft, ranked 67 countries as extremely vulnerable to climate change. The economic impacts of climate change will be most keenly felt by Bangladesh (1st and most at risk), Guinea-Bissau (2nd), Sierra Leone (3rd), Haiti (4th), South Sudan (5th), Nigeria (6th), DR Congo (7th), Cambodia (8th), Philippines (9th) and Ethiopia (10th), which make up the 10 most at risk countries out of the 193 rated by the CCVI. However, other important growth markets at risk include: India (20th), Pakistan (24th) and Viet Nam (26th) in the 'extreme risk' category, in addition to Indonesia (38th), Thailand (45th), Kenya (56th) and, most significantly, China (61st), all classified at 'high risk.' (Maplecroft, 2014)

Maplecroft's CCVI has been developed to identify climate-related risks to populations, business and governments over the next 30 years, down to a level of 22km² worldwide. It does so by evaluating three factors: exposure to extreme climate-related events, including sea level rise and future changes in temperature, precipitation and specific humidity; the sensitivity of populations, in terms of health, education, agricultural dependence and available infrastructure; and the adaptive capacity of countries to combat the impacts of climate change, which encompasses, R&D, economic factors, resource security and the effectiveness of government.

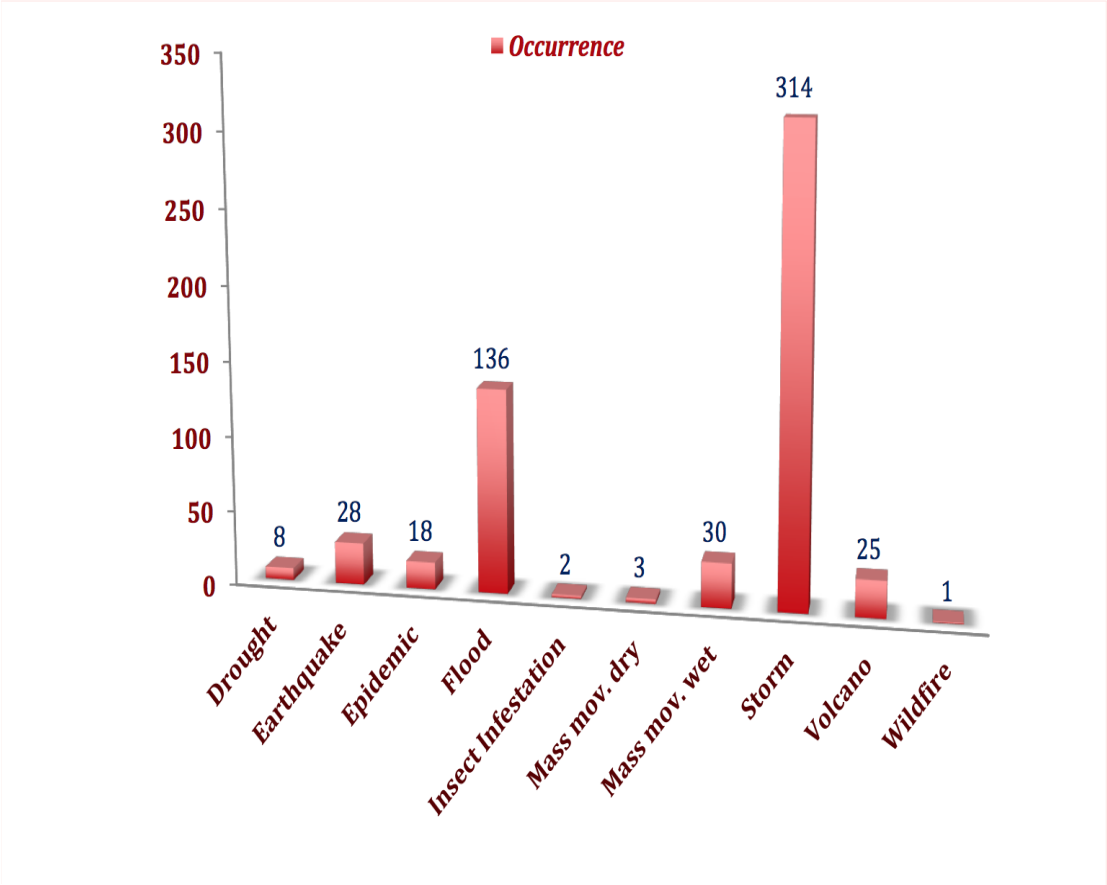
With regard to the region, a 2009 study by the Asian Development Bank (ADB), suggests that on average Southeast Asia "is likely to suffer more from climate change than the rest of the world, if no action is taken." Letchumanan (2014) continues that such action should be " a holistic and integrated response, which cannot be fixed by technology or finite human or capital resources alone." In addition, Sano (as cited in Oxfam, 2014) suggests that the only global multilateral process that addresses climate change, e.g., the United Nations Framework Convention on Climate Change (UNFCC) and its Kyoto protocol, has to move because "we cannot solve a wholesale problem like climate change with retail solutions at the individual or national level only."

3. Effects on the Philippines

For the Philippines, a similar pattern may be observed (See Fig. 3). Storms and floods have perennially wrought havoc to the country. Natural disasters have affected the country's people, property and businesses, amounting to some USD 29B in economic damages per year (COA 2014). Being archipelagic and because of its location, the country is one of the most vulnerable to these impacts. The Philippines ranked highest in the world in terms of vulnerability to tropical cyclone occurrence and third in terms of people exposed to such seasonal events.

[3] *The Climate Change Vulnerability Index is a global ranking instrument, calculating the vulnerability of 170 countries to the impacts of climate change over the next 30 years. CCVI evaluated 42 social, economic and environmental factors to assess national vulnerabilities. These include exposure to climate-related natural disasters and sea-level rise; human sensitivity, in terms of population patterns, development, natural resources, agricultural dependency and conflicts; and assessment of future vulnerability by considering the adaptive capacity of a country's government and infrastructure to combat climate change (Maplecroft, 2010).*

Fig. 3. Occurrence of Natural Disasters in the Philippines, 1900-2014



No. of events	565
No. of people killed	69,724
No. of people affected	185,749,697
Economic damage (000 US$)	22,971,533

Source: "EM-DAT: The OFDA/CRED International Disaster Database www.em-dat.net - Université Catholique de Louvain - Brussels - Belgium"

Source: Commission on Audit, Assessment of Disaster Risk Reduction and Management (DRRM) at the Local Level, 2014, p.8.

Responses to Climate Change

Addressing the risks and hazards of climate change has been considered a post-2015 development agenda (sustainable development goals or SDGs), beyond the concerns of achieving the Millennium Development Goals of generally halving poverty by 2015 (GPDRR, 2013).

Advocacies and actions towards disaster risk reduction and the building of resilience[4] have been put forward, including specifically, 1) the call on countries to develop nationally agreed standards for hazard risk assessment especially of critical infrastructure like schools, health centers, electricity and water systems, nodal ITC data centers, road and transport systems; 2) the call on the private sector to incorporate disaster risk considerations in risk management practices; and 3) stimulate collaboration among the public and private sectors at the national and local levels in risk management (GPDRR 2013 as cited by Hitoshi, 2014).

1. Initiatives of the ASEAN

For the ASEAN, the ASEAN Leaders have expressed their concern and commitment for ASEAN to play a proactive role in addressing climate change through their declarations to the 2007 Bali and 2009 Copenhagen UN Conferences on Climate Change. They view the protection of the environment and the sustainable use and management of natural resources as essential to the long-term economic growth and social development of countries in the region. The ASEAN Vision 2020 calls for "a clean and green ASEAN" with fully established mechanisms to ensure the protection of the environment, sustainability of natural resources, and high quality of life of people in the region (Letchumanan, 2014; www.asean.org).

To realize the ASEAN Vision, in October 2003, the Heads of State/Government of ASEAN Member States (AMS) declared that "an ASEAN Community shall be established comprising three pillars, namely political and security cooperation, economic cooperation, and socio-cultural cooperation that are closely intertwined and mutually reinforcing for the purpose of ensuring durable peace, stability and shared prosperity in the region". The Roadmap for an ASEAN Community 2009 - 2015 lays out the goals, strategies and actions to realize the ASEAN Community by 2015 – an ASEAN Community that is politically cohesive and peaceful, economically integrated and vibrant, and socially responsible and caring (Letchumanan, 2014; www.asean.org).

[4] *Disaster resilience is defined as the ability of countries, communities, businesses, and individual households to resist, absorb, recover from, and reorganize in response to natural hazard events, without jeopardizing their sustained socioeconomic advancement and development (ADB. 2012. Investing in Resilience: Ensuring a Disaster-Resistant Future. Manila) It recognizes the highly dynamic, continually shifting nature of the state of resilience as populations grow and move; capital investments expand; and the frequency and intensity of meteorological, hydrological, and climatological events change as a consequence of climate change. Disaster resilience at all levels of society is a critical component of efforts to achieve sustainable socioeconomic development and poverty reduction.*

ASEAN has been actively engaged in international negotiations in ensuring a fair, effective and equitable outcome for a new climate change regime. The ASEAN Member States made a number of declarations and statements supporting climate change since 2007. These include:

A. ASEAN Declaration on Environmental Sustainability (13th ASEAN Summit in 2007)
B. ASEAN Declaration on COP-13 to the UNFCCC and CMP-3 to the Kyoto Protocol (13th ASEAN Summit in 2007).
C. Singapore Declaration on Climate Change, Energy and the Environment (3rd EAS Summit in 2007)
D. Joint Ministerial Statement of the 1st EAS Energy Ministers Meeting (2007)
E. Ministerial Statement of the Inaugural EAS Environment Ministers Meeting (2008)
F. ASEAN Joint Statement on Climate Change to COP-15 to the UNFCCC and CMP-5 to the Kyoto Protocol (15th ASEAN Summit in 2009)
G. Singapore Resolution on Environmental Sustainability and Climate Change (11th AMME in 2009 as cited in Letchumanan, 2014).

Indonesia hosted the 13th Conference of Parties (COP13) of the United Nations Framework Convention on Climate Change (UNFCCC) in Bali in 2007, which set in place the Bali Roadmap initiating the current talks to conclude a new global climate change deal in Copenhagen in December 2009.

ASEAN has also ensured their commitment towards effective bilateral, regional and global partnership to promote the development and transfer of low carbon technologies including cleaner and climate-friendly technologies.

Building partnerships with international financial and development cooperation institutions to encourage innovative financing options is predicted to stimulate investment in climate-friendly technology and development for ASEAN and the rest of the world. It is recognized within this context that economic and social development, including poverty eradication and environmental protection, are principal priorities of developing countries.

These are also captured in the ASEAN Socio-Cultural Community (ASCC) Blueprint 2009 – 2015, the main strategic objective of which is to enhance regional and international cooperation to address the issue of climate change and its impacts on socio-economic development, health and the environment (Letchumanan, 2014; www.asean.org).

In addition, the region has developed the ASEAN Agreement on Disaster Management and Emergency Response (AADMER): Regional Cooperation Towards a Disaster Resilient Community. The AADMER is a regional legally binding framework or agreement that binds ASEAN Member States together to promote regional cooperation and collaboration in reducing disaster losses and intensifying

joint emergency response to disasters in Southeast Asia (http://drrknowledge.net/ intl-protocols/ Accessed October 6, 2014). It has also adopted a number of Plans, which include, among others: 1) ASEAN Climate Change Initiative; 2) Green Capitals Initiative; 3) Agreement on the Trans-boundary Haze Pollution; 4) ASEAN Heritage Parks Program; and 5) ASEAN Initiative on Environmentally Sustainable Cities (Letchumanan, 2014).

2. Addressing Climate Change in the Philippines

Meanwhile, in response to the urgency for action on what has essentially become a global crisis, the Philippine government passed Republic Act 9729, also known as the Climate Change Act of 2009, anchored on the constitutional provision which states that "it is the policy of the State to afford full protection and the advancement of the right of the people to a balanced and healthful ecology... to fulfill human needs while maintaining the quality of the natural environment for current and future generations." (CCC, 2011).

RA9729 provides the policy framework with which to systematically address the growing threats on community life and its impact on the environment. Among others, it instituted of a Climate Change Commission (CCC), an independent and autonomous body that has the same status as that of a national government agency. The CCC is under the Office of the President and is the "sole policy-making body of the government which shall be tasked to coordinate, monitor and evaluate the programs and action plans of the government relating to climate change" (Section 4). Specifically, the CCC's functions include:

- The formulation of a framework strategy and program, in consultation with the global effort to manage climate change,
- The mainstreaming of climate risk reduction into national, sector and local development plans and programs,
- The recommendation of policies and key development investments in climate-sensitive sectors,
- The assessments of vulnerability and facilitation of capacity building.

The national climate change framework strategy has recently been translated into a National Climate Change Action Plan (NCCAP), which prioritizes food security, water sufficiency, ecosystem and environmental stability, human security, climate-smart industries and services, sustainable energy, and capacity development as the strategic direction for 2011 to 2028.

The Philippines through the CCC later crafted the National Framework Strategy for Climate Change 2010-2022 in 2010 and the National Climate Change Action Plan: 2011-2028 in 2011 (CCC, 2011).

The Framework envisions a climate risk-resilient Philippines with healthy, safe, prosperous and self-reliant communities, and thriving and productive ecosystems. The goal is to build the adaptive capacity of communities and increase the resilience

of natural ecosystems to climate change, and optimize mitigation opportunities towards sustainable development.

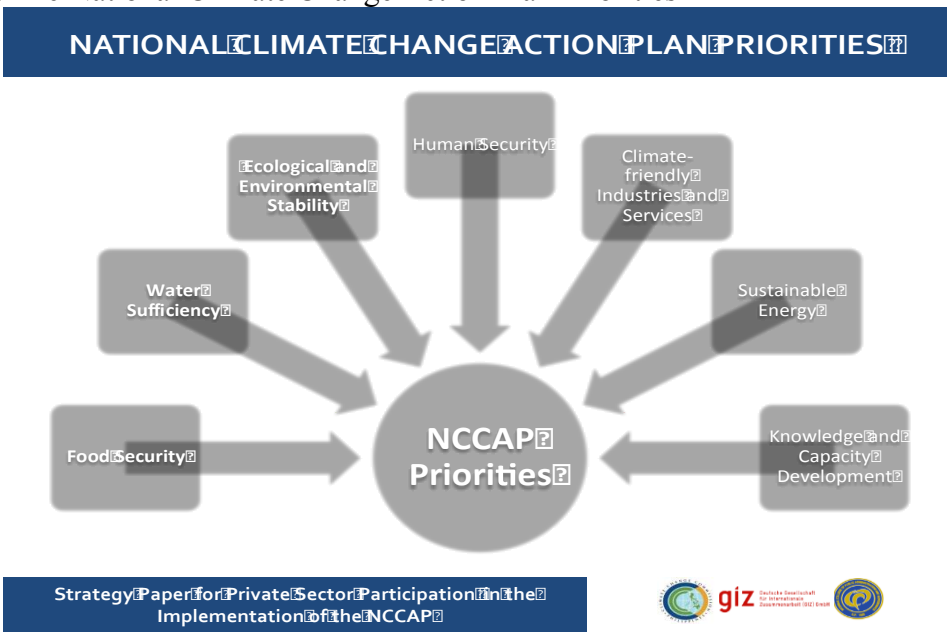
In addition, it recognizes the value of forming multi-stakeholder participation and partnerships in climate change initiatives, including partnerships with civil society, the private sector and local governments, and especially with indigenous peoples and other marginalized groups most vulnerable to climate change impacts. Also, policy and incentive mechanisms to facilitate private sector participation in addressing adaptation and mitigation [5]objectives shall be promoted and supported (CCC, 2011).

The Action Plan meanwhile comprehensively addresses the challenges of climate change. Public financing will prioritize adaptation to reduce vulnerability and risks of communities particularly the marginalized poor. At the same time, this plan will provide a policy environment that will encourage the participation of the private sector to optimize mitigation opportunities towards sustainable development. Its priority programs include the following (Fig. 4).

Private Sector Participation in Climate Change Initiatives

Planning to address climate change has been the domain of government. However, to effectively address the adverse effects of extreme weather events and other manifestations of this global problem, and ensure successful implementation of these initiatives, there is an urgent need to engage the private sector, civil society and ordinary citizens because the government cannot do these enormous tasks alone.

Fig. 4. The National Climate Change Action Plan Priorities



Source: CCC 2012

[5]***Climate change mitigation*** *is a human intervention to reduce the sources or enhance the sinks of greenhouse gases (IFCC 2013).* ***Adaptation*** *is the process of adjustment to actual or expected climate and its effects. In human systems, adaptation seeks to moderate or avoid harm or exploit beneficial opportunities. In some natural systems, human intervention may facilitate adjustment to expected climate and its effects (IPCC, 2014)*

1. The Need for Private Sector Participation

The private sector has particular competencies, which can make a unique contribution to adaptation, through innovative technology, design of resilient infrastructure, development and implementation of improved information systems and the management of major projects (IFC, 2010). It is also essential to mobilize financial resources and technical capacity, leverage the efforts of governments, engage civil society and community and develop innovative climate services and adaptation technologies (Biagini and Miller, 2013).

Unfortunately, governments are not clear on how to engage the private sector. Likewise, private sector efforts at climate change mitigation and adaptation are not widely understood nor seen as good business practice. Also, in general, their participation is impeded by several obstacles (Biagini and Miller, 2013).

In addition, relatively few (private) companies have yet considered both the impact of climate change on their existing activities, and perhaps as importantly, the new commercial opportunities that will emerge both domestically and globally. Specifically, corporate climate change (initiative) is perceived to be either irrelevant or at best an extension of their Corporate Social Responsibility (CSR) (IFC, 2010).

Likewise, financial institutions in both public and private sectors lack the capacity to evaluate 'innovative projects, goods and services' for climate change mitigation and adaptation. This lack of understanding of specific types of climate change investments and their risk profiles means that banks often find it difficult to develop and structure appropriate financial products. Add to this is a seeming consensus that the bulk of climate change funding would be administered by the government with a lot of the implementation done by Non- Government Organizations (NGOs). Hence there was little incentive or motivation for companies to commit scarce and valuable senior management time to consider opportunities in tackling climate change (IFC, 2010).

Nevertheless, the information gaps and awareness inadequacies are now gradually being filled and built. There seems to be a greater appreciation of the risks and costs of climate change at present as many countries have identified their own climate change priorities through their National Climate Change Action Plans (NCCAPs). They have also publicized these needs in the form that may encourage business engagement.

Private initiatives are not a substitute for governmental efforts, and indeed, the former are very dependent on the latter for information, supportive policies and regulation, and other support. Some elements of climate change adaptation (and mitigation) are primarily or even exclusively government functions and are likely to remain so, particularly the provision of basic weather and climate information, design and implementation of risk management policies (e.g., building codes, land use restrictions, and insurance regulations), and disaster planning and preparedness.

2. Private Sector Engagement (PSE)

The private sector is more and more engaged now to help government address climate change. This is mainly due to the realization that extreme weather disturbances and weather-related disasters pose and have, in fact, caused financial losses to several businesses. Disrupted production and delivery due to floods, typhoon, and earthquake, for example, resulted in dramatic losses, thus prompting the private sector to think of solutions to sort of minimize, if not totally avoid, such vulnerabilities.

Not surprisingly, one of the very first climate change adaptation-related steps taken by private sector organizations is to prepare for and manage their exposure to climate change. “Climate proofing” of public sector investments became a natural and logical response. Design and construction of factories, workplaces and economic zones, among others, took into consideration safety and environmental standards meant to protect business from unforeseen climate-related catastrophes .

It did not take long for the sector to realize that its interventions and action must go beyond its own backyard. Private sector organizations were soon engaged also in rehabilitating and making resilient communities mostly under the ambit of their CSR and Corporate Social Investment. Furthermore, there also came “emerging business opportunities in helping others to reduce their climate risks. These include generating new finance, to help fill the massive deficit in available funds for adaptation; designing, manufacturing and distributing goods and services that can help reduce the vulnerability of individuals and communities to climate change; and, providing risk management tools, including insurance” (SEI, 2010).

A survey of existing climate change-related programs across the world reveals that the private sector has covered areas such as capacity building, education and training; finance and insurance; food, agriculture, forestry and fisheries; technology and information & communications technology (ICT); water resources; science, assessment, monitoring and early warning; business; and human health (GEF, 2012).

A new model is emerging, e.g., Area Business Continuity Paradigm (BCP), which embraces and forges various means of collaboration, unified (area scale) management in coordination with public and private sectors, and sharing of critical resources such as water, energy, transportation and communication, to ensure continuity of business operations or promptly restart business after disasters (Hitoshi, 2014).

3. PSE in the Philippines

In the Philippines, space has been provided for the private sector to participate in any of the activities in the National Climate Change Action Plan (NCCAP) (See Table 3).

Table 3. Possible Private Sector Engagement in the NCCAP

Priorities	Outcomes	Possible Private Sector Engagement
1. Food security	The objective of the national strategic priority on food security is to ensure availability, stability, accessibility, and affordability of safe and healthy food amidst climate change.	Firms can support the crop-specific vulnerability assessments and integration of climate change in farming and fishing practices and trainings
2. Water sufficiency	In light of climate change, however, a comprehensive review and subsequent restructuring of the entire water sector governance is required. It is important as well to assess the resilience of major water resources and infrastructures, manage supply and demand, manage water quality, and promote conservation.	Private sectoparticipation in the rehabilitation and improvement of water infrastructure and management systems will enhance initiatives in sustaining equitable access to safe and affordable water.
3. Ecological and Environmental stability	Ecosystem resilience and environmental stability during the plan period is focused on achieving one immediate outcome: the protection and rehabilitation of critical ecosystems, and the restoration of ecological services.	Promotion of environmentally-sound business practices will contribute much to promoting environmental and ecological stability
4. Human security	The objective of the human security agenda is to reduce the risks of women and men to climate change and disasters.	Firms that deliver health and social protection packages, and those that help establish human settlements are key to improving responsive health and social delivery systems.
5. Climate-friendly industries and services	NCCAP prioritizes the creation of green and eco-jobs and sustainable consumption and production. It also focuses on the development of sustainable cities and municipalities.	Climate-Smart Industries and Services promote green industries (those that put heavy emphasis on low-carbon strategies and mitigation efforts), the creation of green jobs, and the development of sustainable cities and municipalities.
6. Sustainable energy	NCCAP prioritizes the promotion and expansion of energy efficiency and	For promotion and use of sustainable energy, the private sector is particularly important

	conservation; the development of sustainable and renewable energy; environmentally sustainable transport; and climate-proofing and rehabilitation of energy systems infrastructures.	as they have great potential for developing, promoting and marketing alternative environmentally sustainable transport and renewable energies.
7. Knowledge and capacity development	The priorities of the NCCAP on knowledge and capacity development are: • Enhanced knowledge on the science of climate change; • Enhanced capacity for climate change adaptation, mitigation and disaster risk reduction at the local and community level; and • Established gendered climate change knowledge management accessible to all sectors at the national and local levels.	They also have roles to play in cross-cutting strategies such as gendered knowledge management, capacity building, research and development and technology transfer.

Source: CCC 2010

This space has been filled up by the private sector in the country through initiatives such as technology transfer, information, education and communication (IEC) campaigns, capacity building, research and development. Specifically, based on our initial mapping, the following are some of the PSE in climate change adaptation and mitigation in the Philippines (Table 4):

Table 4. Initial Mapping of Private Sector Engagement in Climate Change Adaptation and Mitigation in the Philippines

Food Security
Setting up of a state-of-the-art egg production facility in Tarlac that would use modern ventilation and climate control mechanisms to ensure high production. 2014 AgriNegosyo Summit for agri-entrepreneurs and provision of industry-leading technology such as business connectivity solutions and cloud computing and storage services to help them develop and maintain innovative services. Sustainable large-scale organic moringa agribusiness for the MNFA farmers and partner organizations, which includes technical assistance to the farmers on organic and natural farming techniques for successful implementation of organic methods.
Water Sufficiency
The “Adopt-a- Watershed” program in Ipo, begun in 2006, engaged volunteer organizations in reforestation. The 2 concessionaires reforested 110 hectares in 2010 and 450 hectares in 2011. The reforestation target for 2012 onwards is 900 hectares per year. Wastewater recycling and resource recovery strategies (Anaerobic digestion and recovery of methane gas from wastewater)

Ecological and Environmental Stability
Hiring of foresters to provide technical assistance in various reforestation methods; alternative livelihood for villagers (former kaingeros and charcoal-producers) Develop an alternative ecotourism destination near Baguio City where tourists, guests, and visitors can commune with nature, can be entertained with indigenous culture, and can buy fresh products Designing, developing and assembling electric vehicles as substitutes for smoke-belching gasoline or diesel-fueled vehicles. Setting up of the first integrated green charcoal, vermicast, biotech fertilizer and pest control production lines PEMC Cares coastal cleanup campaign in Calatagan, Batangas. PEMC partnered with Hands-on Manila to implement the activity, in cooperation with the Conserve and Protect Oceans Foundation (CAP-Oceans) SKAL Tourism Personality Awards include a category on environment and agri-tourism.
Human Security
Plant rehabilitation and refurbishments to ensure energy security, develop a sustainable energy system, and promote human health and security Introduction of a unified number (7622) that may be used for free during disaster - powered by Chikka Libreng Tawag Centers for affected residents during typhoon and other natural disasters in some areas in NCR. #StaySafePH shares valuable tips and info on how to be safe during times of calamities and disasters. Selected Globe stores have also offered free charging for customers' mobile phones and gadgets. Barangay emergency response programme (BERP)/Neighborhood emergency services team (NEST) Master planned communities - Veritown Fort in Bonifacio Global City, Filinvest City, Makati CBD, Circuit Makati, Vista City, ARCA South Distribution of 200 fiberglass-fishing boats to fishermen in Ormoc City affected by typhoon Yolanda through the 6200 Mission Possible Project in Leyte IV. Megaworld’s percentage distribution of its total donations to charitable causes - 6% for calamity response and 1% for environment
Climate Smart Industries and Services
Investing in a global flash storage solutions to boost disaster recovery, backup and replication processes. The system is used to store and manage designs, keep an eye on budgets, manage suppliers, communicate with customers and control projects; In the event of disaster, getting systems fully up and running again would now require only 20 minutes as compared to at least half a day to restore just one database to one server in the past. Backups, which used to take 8 hours, are now completed within 5 minutes. (Source: Mercurio, R.S., "Ortigas & Co. investing in modern technology with Nimble Storage", Phil Star 21 Sept 2014:B-5) Wastewater recycling and resource recovery strategies (Anaerobic digestion and recovery of methane gas from wastewater) Development and commercialization of the solar-powered Automated Weather Monitoring System for urban and rural use
Climate Smart Industries and Services
Preparation of an industry roadmap to create an environment where the use of electric vehicles is highly promoted, encouraged and supported by both the Philippine government

and society that would lead to eco-friendly and efficient transportation. The Philippine Green Building Council (PHILGBC) was organized to serve as a single voice in the promotion of holistic and market-based green building practices by developing a green building rating system called Building for Ecologically Responsive Design Excellence (BERDE) Rating System, the Philippines' own green building rating system (*Source: http://philgbc.org/)* Air conditioning system with comfort-cooling technology, energy-saving and durability features through their comfort cool and efficiently designed heat transfer system. The air conditioning unit has high energy efficiency ratio (EER) compared with other brands with the exact same horsepower. Use of fiber cement (green building material) for the quick construction of affordable yet long-lasting homes to grapple with destructive Clean Fleet Management - Improve the fuel efficiency and attain sustainable greenhouse gas (GHG) reduction on the business operations, specifically its 350 units of fleet
Sustainable Energy
Net metering service and provision of solar energy systems, commercial and residential clients that are within the grid: Households can sell excess electricity generated through renewable energy (i.e., solar power) through credit system. RAMCAR/Motolite's development of deep cycle batteries for solar panels to generate solar power. A solar facility was set up for testing. Meralco Power Academy's SOLAR PV Boot Camp - training and information dissemination on new technology in the energy sector
Knowledge and Capacity Development
Disaster related computer applications, such as NABABAHA.COM, a system that enables real-time flood simulation SHELL ECO-MARATHON (SEM) program on smarter mobility, the engineering student teams whose unique vehicle design and construction, travel the farthest distance using the least amount of energy Bayer Young Environmental Envoy (BYEE) Program – College students participate in a five-day Eco-Camp. Resource persons from government, business, academe, the private sector, and non-governmental organizations talk about what their respective sectors are doing for the environment. In-situ education for ecovillage design and community resilience by establishing a doable and replicable model of sustainable living, which shall serve as teaching demonstration area
Climate Financing
Forms of financing of CCAs Endowments and grants for CCA initiatives Financing instruments, e.g. credits and guarantees for projects and public private partnerships Technical assistance to projects, e.g., capacity building, consultation BPI's funding of research study "Business Risk Assessment and the Management of Climate Change Impacts" Assess the vulnerability levels of cities prone to the impacts of climate change. Cities - Cebu, Davao, Baguio and Iloilo (2010); Cagayan de Oro, Zamboanga, Laoag and Dagupan (2012), Angeles, Tacloban, Naga and Bacolod (2013) IFC's advisory services

(BDO) giving the local private sector appropriate financing for sustainable energy investments (Manila Water) public-private partnership advisory support from IFC $60 million in long-term debt financing in 2003 and another $15 million in equity in 2005 to Manila Water BDO Capital's collaboration with four local commercial banks to finance a syndicated term loan for the 67.5 MW wind power project in Pililla, Rizal. BPI loan financing of Central Mall Biñan solar rooftop project First solar project that was granted loan financing by BPI Due to Solar Philippines' BOI accreditation, the project enjoys tax exemptions and credits Purchase power agreement between Solar Philippines and Premiumlink: energy generated by the solar power plant is sold to the mall for its own consumption at a lower rate Reduces the mall's electricity bills by Php100, 000

Source: NCPAG UPD, 2014

Implications on Regional Governance

Climate change is a regional and global development issue that requires collective solutions. Addressing its adverse effects would require mitigation, adaptation, disaster preparedness, recovery, rehabilitation and other initiatives from the government, the civil society and private sector and also from ordinary citizens like you and I not only in my country, your country but of our common planet, the Earth.

In this paper, some of the initiatives of the private sector in climate change adaptation and mitigation have been presented. Private initiatives are shown not a substitute for governmental efforts, but as complementary to government's as the former are still very dependent on the latter for information, supportive policies and regulation, and other support.

Some elements of climate change adaptation (and mitigation) are primarily or even exclusively government functions and are likely to remain so, particularly the provision of basic weather and climate information, design and implementation of risk management policies (e.g., building codes, land use restrictions, and insurance regulations), and disaster planning and preparedness.

Progressively, what emerged in the relationship between the government and the private sector in dealing with climate change appears anchored on the concept of 'collaborative governance' (Ansell, n.d), which is a new form of governance that has evolved to replace adversarial and managerial modes of policy making and implementation. It brings public and private stakeholders together in collective forums with public agencies to engage in consensus-oriented decision making, to manage conflict, improve coordination, and harness creativity. It involves multiple stakeholders engaged in multilateral interactions about multi-dimensional issues (Ansell and Gash 2007) like climate change.

There are tasks that have yet to be done like a) Assessing Risk**;** global economic losses, small local events; b) Targeting the root causes of risk: price fluctuations, unemployment, violence, conflict, and health burden; c) Including Communities for results**:** women, youth, disabilities; d) Leading at the local level: municipalities, schools and hospitals; e) Recognizing private sector as actor and partner: economic growth, resilient business and investment; f) Strengthening risk governance**:** communities and local governments; g) Strengthening scientific and technical support**:** analysis, knowledge, data, tools, method; and h) Building mutually reinforcing agendas**:** sustainable development, environment, climate change impact, economic and social development (GPDRR 2013 as cited in Hitoshi 2014). But if the multiple stakeholders concerned continue to trust one another, have open and transparent lines of communication, and embrace the common multidimensional problems and solutions as their responsibilities, there is hope that climate change may be addressed more holistically, multilaterally and successfully in the near future.

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