Consultancy Service for Developing Climate Change Vulnerability Indices for CLUP-CDP and NCCAP

INCEPTION and INTERIM REPORT

Submitted by:

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Rationale and Objectives

This document serves as the Inception Report for the project "Developing Climate Change Vulnerability Indices for CLUP-CDP and NCCAP." It re-states the rationale and objectives for the project, discusses a review of related literature, presents a more detailed workplan and recaps the tasks already completed.

As stated in the TOR, the main objective of this project is "to support the development of a coherent and practical metrics or indicators for vulnerability and adaptation assessment that can be consistently applied at the national and sub-national levels." Reducing vulnerability and building adaptive capacity are continuous processes; thus, concrete indices are needed for monitoring and evaluation (M&E) of progress and determining next steps.

This project will help harmonize existing initiatives in the sub-national and national levels, and identify and address existing gaps in developing manageable indices. The vulnerability and impact assessment (VIA) indices being envisioned will be based as much as possible on variables and data already being collected by existing monitoring systems, identifying potential proxy variables when needed, so that the indices can be immediately adopted and implemented. They are also envisioned to be scalable indices which are determined primarily in specific local to sub-national contexts, but can be aggregated for national and international reporting. It is hoped the development of standard system of indicators will facilitate communication, comparison and decision-making among agencies and offices both horizontally and vertically to efficiently allocate resources for climate change action-planning.

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Scoping / Review of Related Literature

I. Characteristics of International Vulnerability Assessments

a. Understanding vulnerability

Owing to its diverse origin and use, the term vulnerability has no universally accepted meaning (Fussel, 2009). This has significant implications on how it is operationalized in a process called vulnerability assessment. Generally, the gamut of interpretations of vulnerability can be grouped into two categories: vulnerability as an outcome, or as a pre-existing condition (Alwang et al, 2001 in Rygel et al, 2006; Fussel, 2010).

On one hand, framing vulnerability as an outcome considers vulnerability as an impact. As such, vulnerability assessments employing this framework rely heavily on climate scenarios that drive the impact. The impact focus is also reflected in the resulting policy recommendations that are often in the form of technological interventions that seek to avoid, or mitigate the impacts (Rygel et al, 2006; Fussel, 2009; Kelly and Adger, 2002 in Eriksen and Kelly, 2007; GIZ, 2013). On the other hand, framing vulnerability as pre-existing condition emphasizes the ability of the system to respond to threats. Vulnerability assessments guided by this framework focus on the context, particularly the social factors that determine why impacts across different groups vary. Policy recommendations following such vulnerability assessments are more social because the emphasis is on the ability of the population to adjust and respond to threats (Kelly and Adger, 2002 in Eriksen and Kelly, 2007). While the aspects of vulnerability highlighted by the aforementioned approaches vary, they are not mutually exclusive and can, therefore, be integrated to come up with a fuller picture of vulnerability (GIZ, 2013).

Although conceptions of vulnerability vary, vulnerability assessments share the common goal of understanding the nature of threats, and subsequently use such understanding to formulate policies to avoid or mitigate the threats. In the context of climate change, efforts to lessen or prevent the threats from happening are called adaptation (Eriksen and Kelly, 2007; GIZ, 2013). More recently, the importance of vulnerability assessments for monitoring and evaluating the effectiveness of adaptation actions is also being recognized (Eriksen and Kelly, 2007). However, their value as inputs to policy and in monitoring the impacts of policy are yet to be realized (GIZ, 2013).

b. Vulnerability assessments: operationalizing vulnerability

The vulnerability of populations or systems cannot be measured directly, thereby making its assessment challenging. Fussel (2009) posits that vulnerability assessments must describe the four components of vulnerability: (1) system being considered, (2) attributes of the system, (3) hazard involved, and the (4) temporal reference. Clarifying the locus of vulnerability assessments in each of the components is imperative because the factors that shape vulnerability operate at different spatio-temporal scales, and are often hazard specific (Vincent, 2004).

As previously mentioned, vulnerability is intangible. As such, it can only be indirectly represented by factors (called indicators) that contribute to the different levels of vulnerability, or by factors that measure the consequences of vulnerability. The foremost challenge, therefore, of vulnerability assessments is in choosing indicators that accurately represent a vulnerable condition. The task of operationalizing vulnerability is twofold: first, is to choose indicators, and second, is to ensure that the chosen indicators are valid.

Choosing indicators can either be inductive or deductive (Kelly and Adger, 2002 in Eriksen and Kelly, 2007; Neimejer, 2002 in Vincent, 2004). On one hand, selecting indicators inductively means going through a host of potential indicators and testing which of them are significant. Generalizable relationships are subsequently drawn from the significant variables. On the other hand, choosing indicators deductively starts with theories on the determinants of vulnerability and narrowing the set of indicators based on those theories.

The subsequent step of testing the validity of the chosen indicators is challenging for two reasons. First, it is limited by the availability of data, that and the chosen proxies may not be representative of the factors and processes that shape vulnerability. And, second, because it is based on current data, it can only be tested in the context of coping rather than the longer-term process of adaptation (Kelly and Adger, 2002, in Eriksen and Kelly, 2007). Nevertheless, correlations of past and historical data may still be performed to validate the structure of a vulnerability assessment (Vincent, 2004). Given these difficulties, most studies stop at choosing vulnerability indictors. In some studies, experts are consulted to scrutinize the chosen indicators (Vincent, 2004; Yusuf & Francisco, 2009). While such process may increase acceptability, it still does not address the question of whether the indicators selected accurately capture vulnerability.

Assigning weights, aggregating, and displaying the results constitutes another facet of operationalizing vulnerability. Fussel (2009) and Rygel et al (2006) note that the process of assigning weights and aggregating results is both scientific and political. There is thus no uniform standard on how this must be performed. In most studies, results are aggregated as an index because it lends ease of communication and comparison. Klein (2004), however, cautions that simplicity must be balanced with robustness and comprehensiveness. Experts and other relevant stakeholders are often consulted in determining the relative importance of the different components of vulnerability, while some employ econometric methods like Pareto ranking (Rygel, O' Sullivan, & Yarnal, 2006), or a combination of both.

Presenting results as maps are widely used. As an example, Anh (n.d.) and Yusuf and Francisco (2009) used maps to communicate the relative vulnerabilities of different areas to climate change. Alternative methods of presenting vulnerability include the use of spider and triangle diagrams that were employed by Hahn et al (2009) in comparing the relative magnitudes of vulnerability components of the two districts in Mozambique.

Given the diversity in understanding and operationalizing vulnerability, the transparency on the framework, assumptions, and methods used in vulnerability assessments is imperative for them to be robust and relevant. Moreover, because vulnerability assessments straddle the nexus between science and policy, they must also be participatory to ensure their legitimacy.

c. Examples of vulnerability assessments developed internationally

To better understand the concepts presented so far, the table below are examples of existing vulnerability assessments, particularly their characteristics, and the methods employed to develop and present them.

From the table, it can be observed that an outcome-based framework, particularly the one developed by the IPCC, is more prevalent than the contextual framework. The IPCC framework is also said to highlight biophysical rather than merely social or inherent vulnerability since it combines the latter with measures of physical exposure. Because impact/outcome estimation relies on the magnitude of hazards, most assessments use changes in climate and weather-related variables (e.g. temperature and rainfall) as indicators.

The choice of vulnerability components highlighted depends on the objectives with which the assessment tool was developed and the policy questions asked. As an example, in assessments whose goal is to compare the relative vulnerabilities of different countries, vulnerability is disaggregated into its basic components, namely, exposure, sensitivity, and adaptive capacity for those using the IPCC framework, and other additional elements like resistance and damage for those that are using a different approach (VI-CRED and EVI). Whereas in assessments that aim to concretely influence adaptation actions, vulnerability components are further grouped into sectors to easily identify possible entry-points of adaptation measures (CVM, GAIN, Tunisian and Indonesian vulnerability assessment tools).

The choices of indicators that constitute each of the vulnerability components are likewise dependent on the different objectives of the assessment and the diverse contexts where it is applied. The indicators listed below demonstrate such diversity. Some indicator characteristics can, however, be generalized: human impacts are often expressed as mortality, whereas sectoral impacts are represented by losses to GDP. Moreover, adaptive capacity and sensitivity of populations (social vulnerability) are also often gauged by the state of and access to resources and services (e.g. availability of freshwater per capita, health expenditure, income, access to supply and sanitation).

In terms of the methods employed in selecting indicators, theories that relate a particular variable to an aspect of vulnerability as well as consultations with experts are often employed. In the Tunisian assessment, models were also used to inform indicator choice. The examples shown reflect the dearth of methods that validate whether the chosen indicators truly measure vulnerability, and whether the tools developed can capture changes in vulnerability over time. The examples also demonstrate the preferred method of presenting the results visually that is often targeted for non-specialists, particularly policy-makers and relevant stakeholders.

Table 1. Examples and characteristics of existing vulnerability assessments (compiled from Stanton et al, 2012; Morchain and Butterfield, n.d.; GIZ, 2013; GAIN, 2011; DARA, 2012; SOPAC, 2004)

Name of assessment tool/study	Objective	Vulnerability Framework & Components	Indicators Used[2]	Methods		
				Selection of indicators	Validation	Aggregation/ Presentation
Vulnerability Index for the Climate and Regional Economics of Development (VI-CRED)	Stanton, E., Cegan, J., Bueno, R., & Ackerman, F. (2012). *Estimating regions' relative vulnerability to climate damages in the CRED Model*. Retrieved from Stockholm Environment Insitute: http://sei-us.org/Publications_PDF/SEI-WorkingPaperUS-1103-v2.pdf					
	Compare economic damages due to climate change (across regions)	(IPCC) Sensitivity	• Contribution of agriculture & tourism to GDP (identified as the most climate-sensitive sectors) • Availability of freshwater per capita	Literature review (deductive)	Comparison with other similar indices	Index, Ranking
		Exposure	• Proportion of population inhabiting areas that are less than 5 meters above sea level			
Global Adaptation Index (GAIN)	GAIN (2011). *The global adaptation index: measuring what matters.* Retrieved from Global Adaptation Institute: http://index.gain.org/					
	Determine vulnerability to climate change and readiness of institutions to	(IPCC, sectoral: water, food, health, infrastructure)	• Projected changes in precipitation and temperature • Projected change in agricultural yield and coefficient of variation in	Consultation, suitability and availability of data (inductive)	Not indicated/ None	Matrix, Index, Thematic map

[2] Not exhaustive

Name of assessment tool/study	Objective	Vulnerability Framework & Components	Indicators Used[2]	Methods		
				Selection of indicators	Validation	Aggregation/ Presentation
	absorb investments for adaptation (across countries)	Exposure	cereal crops • Mortality due to infectious diseases • Population with access to reliable electricity • Frequency of floods per unit area • Areas with low elevation (<10 meters above sea level)			
		Sensitivity	• Freshwater extracted internally and externally • Under 5 mortality due to water-borne diseases • Population living in rural areas • Food import dependency • Health workers per capita • Health expenditure derived from external sources • Population in low-lying areas • Energy at Risk • Roads paved			

Name of assessment tool/study	Objective	Vulnerability Framework & Components	Indicators Used[2]	Methods		
				Selection of indicators	Validation	Aggregation/ Presentation
		Adaptive Capacity	• Population with access to improved water supply and sanitation • Agricultural capacity • Children under 5 suffering from malnutrition • Longevity and maternal mortality • Readiness			
Climate Vulnerability Monitor (CVM)	DARA (2012). *Methodological documentation for the climate vulnerablity monitor (2nd edition).* Retrieved from Climate vulnerability monitor: A guide to the calculus of a hot planet: http://daraint.org/climate-vulnerability-monitor/climate-vulnerability-monitor-2012/					
	Determine and compare vulnerability to climate change to inform adaptation	(Vulnerability as impact on four areas) Habitat Change	• Biodiversity, and land and crop productivity losses relative to GDP • Costs of heating and cooling • Costs of sea level rise and water	Literature review (deductive)	Peer review (evaluation criteria not indicated)	Index, Information graphics, Thematic map

Name of assessment tool/study	Objective	Vulnerability Framework & Components	Indicators Used[2]	Methods		
				Selection of indicators	Validation	Aggregation/ Presentation
	policies (across countries)	Health	• Excess diarrheal deaths, malaria (and other vector-borne diseases), meningitis, respiratory diseases, cardiovascular diseases, and skin cancer per capita due to climate change • Excess deaths per capita due to climate change for hunger (malnutrition and associated risk factors)			
		Industry	• Economic stresses (expressed as costs relative to GDP) to land-based agriculture, fishery exports, forestry, hydro energy, tourism, and transport			

Name of assessment tool/study	Objective	Vulnerability Framework & Components	Indicators Used[2]	Methods		
				Selection of indicators	Validation	Aggregation/ Presentation
		Environmental Disasters	• Excess deaths per capita due to climate change manifested as floods, landslides, storms, wildfires, drought, and soil subsidence • Excess damage costs relative to GDP due to climate change (events same as previous bullet point)			
Environmental Vulnerability Index	SOPAC (2004). *Environmental vulnerability index: Description of indicators.* Retrieved from Secretariat of the Pacific Commmunity Applied Geoscience and Technology Division (SOPAC): http://www.sopac.org/sopac/evi/					
	Assess the vulnerability of ecosystems to natural and anthropogenic hazards as input to a more comprehensive index (across countries)	(Vulnerability as a function of hazards and the ability to withstand them) Hazards	• Average annual excess winds, rainfall deficit/excess • Average annual deviation in sea surface temperature • Number of volcanoes weighted by explosion potential • Number of slides recorded in the last 5 years • Average annual pesticides used	Literature and consultation (deductive)	Not indicated/ None	Index

Name of assessment tool/study	Objective	Vulnerability Framework & Components	Indicators Used[2]	Methods		
				Selection of indicators	Validation	Aggregation/ Presentation
		Resistance	• Total land area • Altitude range (relief) • Percentage of land with low elevation (<50m above sea level) • Distance to nearest continent (isolation) • Number of known endemic species per million			
		Damage	• Weighted average change in the trophic level since fisheries began • Total length of all roads in a country (proxy for habitat fragmentation) • Percent of land area that is severely degraded			
Tunisian vulnerability assessments	GIZ (2013). *Comparative analysis of climate change vulnerability assessments: Lessons from Tunisia and Indonesia.* Deutsche Gessellschaft fur Internationale Zusammenarbeit (GIZ) GmbH					

Name of assessment tool/study	Objective	Vulnerability Framework & Components	Indicators Used[2]	Methods		
				Selection of indicators	Validation	Aggregation/ Presentation
	Identify ecosystems that are vulnerable to climate change (national and subnational)	(IPCC, but mostly limited to biophysical sensitivity) Exposure	• Projected changes in temperature and precipitation	Consultation, Use of modeling tools (deductive but bases for choice are not explicit)	Not indicated/ None	Thematic maps, Descriptive review of initiatives
		Biophysical vulnerability	• Distribution of species' environmental requirements for suitable conditions • Soil-water deficit			
Indonesian vulnerability assessments	GIZ (2013). *Comparative analysis of climate change vulnerability assessments: Lessons from Tunisia and Indonesia.* Deutsche Gessellschaft fur Internationale Zusammenarbeit (GIZ) GmbH.					
	Assess sectoral risks for problem orientation and adaptation policy	(UN risk framework) Coastal Sector	• Physical: elevation, slope, land-use • Social: urban population density • Economic: Critical infrastructure	Consultation, statistical analyses, modeling (inductive)		Charts, Tables, Thematic maps,

Name of assessment tool/study	Objective	Vulnerability Framework & Components	Indicators Used[2]	Methods		
				Selection of indicators	Validation	Aggregation/ Presentation
	development (sub-national)	(IPCC) Water sector	• Exposure: urban population density, land use • Sensitivity: function and status of critical infrastructure • Adaptive capacity: housing type, per capita income, drainage, road networks			

II. Philippine vulnerability assessments

Most vulnerability assessments in the Philippines construe vulnerability as an outcome. In particular, the framework developed by the IPCC is widely used. A closer scrutiny of the framework's application, however, reveals that the common usage of the term vulnerability and its components is conflated with the definition propounded by the IPCC. As an illustration, the vulnerability assessment guidebook developed by Cabrido et al (2012) uses rainfall volume, temperature, and moisture as indicators for the sensitivity of the forestry sectors, which, if the IPCC definition is to be strictly followed should be classified under the exposure component. Morbidity and mortality rates are also grouped as exposure indicators for the health sector, which could actually be considered as impacts of exposure or "realized" vulnerability. The same confusion is also evident in the vulnerability assessment using the community-based monitoring system (CBMS) conducted by PEP-Asia network office. It explicitly stated the use of the IPCC framework in defining vulnerability, but revised the definition in its application as inadequate adaptive capacity (see table 2).

The classification of indicators to different components is important because Cabrido et al (2012) asserts that the target of public policy is to address exposure. Clarifying the meaning of exposure (and the related terms) is thus imperative in the targeting of policies, as well as in the proper interpretation of the results of vulnerability assessments. Recalling the implications of using an output-based framework, which the IPCC belongs to, most of the policy recommendations proffered by the local vulnerability assessments are technological adaptation measures like the use of drought resistant crops (BSWM-DA, n.d.) and construction of flood control measures (Cabrido et al, 2012).

Local vulnerability assessments reflect the diversity of vulnerability aspects that are examined. In terms of scale, vulnerability is assessed on the community level (PEP-Asia CBMS Network Office, n.d.), municipality (BSWM-DA, n.d.), and even across different sectors (Cabrido et al, 2012). Vulnerability is also examined in terms of specific hazards such as droughts and typhoons (BSWM-DA, n.d.), or the spectrum of different climate-and-weather-related hazards (Cabrido et al, 2012).

It is noteworthy that in sectoral assessments, its locus of application must be determined because, as previously mentioned, the factors that determine vulnerability are often scale specific. In the sectoral assessment conducted by Cabrido et al (2012), while intended for application at the provincial level, micro-scale indicators like the number of barangays with alternative water sources and the number of households with access to sanitation facilities were included. This might cause confusion in potential policy applications if the recommended policies are outside the purview of those that are tasked to implement such policies. A sectoral focus may also overlook generic indicators that operate across different sectors (e.g. development and governance indicators) (Brooks, Adger, & Kelly, 2005).

In terms of operationalizing vulnerability, the choice of indicators is often inductive. This is usually dictated by available data (Cabrido et al, 2012) and is verified by expert judgment through consultation. The consultation of experts are often called "validation," but as previously stated, it still does not address the fundamental concern of whether the chosen indicators truly represent vulnerability. Hence, local assessments also reflect the problem of the existing body of vulnerability assessment tools in that they suffer from lack of validation in the choice of indicators. Moreover, due to the nascent development of local vulnerability assessment tools, their potential application to policy has yet to be realized. If such potential is, however, effectuated, it poses the challenge of developing methods for monitoring and evaluation that are also deficient in international vulnerability assessments.

While some vulnerability assessments explicitly state the reasons for the choice of indicators, like the agriculture and rural development vulnerability assessment developed by the Bureau of Soils and Water Management (BSWM), most local vulnerability assessments stop at the list of chosen indicators. This may limit the flexibility of the tool because the users are unaware of the reasons why a particular indicator was chosen over another indicator to reflect a certain condition. Such predicament underscores the importance of transparency in the methods and assumptions employed, especially because assessing vulnerability is an iterative process whereby the tools developed are continually adjusted to reflect reality. In terms of the concrete indicators used, if reclassified into categories consistent with the IPCC definition, local indicators are similar to the metrics used by the international community (e.g. availability and access to resources as a proxy for adaptive capacity, morbidity and mortality to represent impacts).

The aggregation and presentation of results of local vulnerability assessments are similar to the pervasive practice of conducting consultations in weighting to reflect priorities, and in presenting the results as maps. In the latter practice, practitioners must note the tradeoff between information and availability (Vincent, 2004).

Table 2. Examples and characteristics of local vulnerability assessments (compiled from Cabrido et al, 2012; BSWM-DA, n.d; PEP-Asia CBMS network office, n.d.)

Name of assessment tool/ study	Objective	Vulnerability Framework & Components	Indicators Used	Methods		
				Selection of indicators	Validation	Aggregation/ Presentation
Sectoral vulnerability assessment tool	Cabrido, C., Lorenzo, E., delos Reyes, M., Morga, C., & Carino, B. (2012). *Training modules and manual on mainstreaming climate change and disaster risk reduction in the provincial development and physical framework plan.* Pasig: National Economic Development Authority.					
	Assess sectoral vulnerability to climate change and disasters to inform physical planning (provincial)	(IPCC, sectoral: agriculture, forestry, biodiversity, coastal and marine, health, water) Forestry	• Sensitivity: Rainfall volume, land cover (vegetation and land use), proximity to water bodies, extent of kaingin activities, incidence of El Nino event • Exposure: extent of denuded areas, extent of upland areas, value of crops • Adaptive capacity: reforestation efforts, awareness of exposed population, relocation efforts, soil and water conservation practices,	Consultation, data availability (inductive, rationale behind the choice is not stated)	Consultation (evaluation criteria not indicated)	Index, Thematic maps
		Health	• Sensitivity: Rainfall, temperature, relative humidity, households with sanitation toilets, waste management practices (barangay level), age			

Name of assessment tool/ study	Objective	Vulnerability Framework & Components	Indicators Used	Methods		
				Selection of indicators	Validation	Aggregation/ Presentation
			structure • Exposure: Morbidity and mortality rate (cholera, gastroenteritis, typhoid, dengue, leptospirosis), health expenditure, access to sanitation and safe water • Adaptive capacity: access to medical facilities and services (households), rehabilitation of water supply system, information campaign on disease prevention, flood control and maintenance,			
Vulnerability mapping of the Central Philippines Rural Development Project	BSWM-DA. (n.d.). *Ranking of municipalities in support to vulnerability mapping of the central Philippines rural development project.* Quezon City: Bureau of Soils and Water Management - Department of Agriculture.					
	Assess the vulnerability of the agriculture sector to climate change to inform planning and resource	(Derivative of IPCC, vulnerability as a function of land suitability, adaptive capacity, exposure)	• Crop production, area planted, yield • Presence of post-harvest, processing, storage facilities • Presence of livelihood activities in the municipalities	Consultation	Consultation	Ranking, Thematic Maps

Name of assessment tool/ study	Objective	Vulnerability Framework & Components	Indicators Used	Methods		
				Selection of indicators	Validation	Aggregation/ Presentation
	allocation (municipality)	Land Suitability (sensitivity)				
		Adaptive Capacity	• Income • Presence of relevant infrastructure			
		Exposure	• Local knowledge on actual occurrence of drought & flood (spatio-temporal distribution) • Rainfall intensity and duration			
Climate change vulnerability mapping in the Philippines: A pilot study	PEP-Asia CBMS Network Office. (n.d.). *Climate change vulnerability mapping in the Philippines: A pilot study.* Manila: Angelo King Institute for Economic and Business Studies (AKI), De La Salle University					
	Operationalize the method developed by Yusuf and Francisco (2009) at a community level and use it to formulate adaptation strategies	(Derivative of IPCC, modification: 1-adaptive capacity) Sensitivity	• Ecological: proportion of protected areas, number of local heritage sites • Livelihood: Percentage of agricultural, commercial, and industrial lands, Proportion of households engaged in fishing • Population: density, proportion of elders, children, and persons with disability	Consultation (inductive, rationale behind the choice is not stated)	Not indicated/ none	Index, Ranking, Thematic Maps

Name of assessment tool/ study	Objective	Vulnerability Framework & Components	Indicators Used	Methods		
				Selection of indicators	Validation	Aggregation/ Presentation
		Exposure	• Typhoons: number of typhoons per year from 1948-2009 • Areas susceptible to landslides and floods (low, medium, high)			
		Adaptive capacity	• Economic (resource and distribution): income, household assets, per capita spending for DRR, GINI coefficient • Skills: literacy rate, number of health workers, number of DDR-trained persons • Information and Technology: DRR communication equipment • Infrastructure: number of health facilities, buildings for evacuation, dikes, dams, roads • Institutions: membership to community organizations, climate change laws, presence of EWS, DRR plans			

Methodology and Workplan

The approach to CCVI development will build on existing resources and processes rather than attempt to institute a completely new system. The proposed indices will be integrated with current databases, methods of collection and monitoring and evaluation to ensure ease of implementation.

The following table, in accordance with the submitted proposal, expounds on the Methods section and reflects an adjusted timeline based on the start date of the consultancy contract (which is on last week of April, whereas the project start data is on the first week). Other adjustments to the timetable may be implemented in the future, based on available dates for pilot-testing and consulting with relevant government agencies.

Outputs	Activities	Methods	Target Completion Date
Prepare an inception report outlining the review of literature, methodologies and proposed detailed workplan	1. Review prevailing VIA assessment framework in the country and its consistency with the standards set at the international community.	1.1. Briefing at the CCC Office; 1.2. Research and consolidation of materials from national and international sources; 1.3. Desk review, analysis and synthesis, consultation with CCC and GIZ.	By 4th week of May
	2. Scope and review existing and proposed VIA metric indices relevant to the Philippine context.	2.1. Research and consolidation of materials from national and international sources; 2.2. Desk review, analysis and synthesis, consultation with CCC and GIZ.	By 4th week of May
	3. Prepare an inception report outlining the review of literature (including 1&2 above), methodologies and proposed detailed workplan	3.1. Drafting of report including results of review above; 3.2. Submitting draft to CCC/GIZ for comments; 3.3. Revision of report as necessary.	By 1st week of June

Outputs	Activities	Methods	Target Completion Date
CLUP-CDP CC Vulnerability Indices NCCAP CC Vulnerability Indices	4. Develop two (2) sets of interrelated climate change vulnerability indices (CCVI) that could be used to measure vulnerability and adaptation at the sub-national level; and be aggregated at the national level to serve as input to international reporting requirements and national level prioritization: a. CCVI anchored at the Comprehensive Land Use Plan and Comprehensive Development Plan of local government units; b. CCVI anchored at the strategic priorities of the National Climate Change Action Plan	4.1. Desk review of CLUP, particularly the sectoral tables and indicators 4.2. Desk review of NCCAP, particularly the 7 strategic priorities and the associated objectives, outcomes and evaluation indices. 4.3. Consultation with GIZ, CCC and other relevant offices as necessary. 4.4. Scoping of existing databases accessible to local government units (e.g. CBMS, LGPMS, BAS), and of results from ongoing vulnerability assessments (e.g. Siargao Ecotown VA). 4.5. Checking/Mapping of CLUP and NCCAP indicators against available data. 4.6. Selection of indicators and organization under the general VIA framework for the (a) CLUP-anchored VIA, and (b) and the NCCAP-anchored VIA; Identification of potential proxy indicators, if needed. 4.7. Mapping of relationship of (a) CLUP-anchored VIA, and (b) and the NCCAP-anchored VIA. 4.8. Articulation of method to determine CC Vulnerability Index based on existing indices within the VIA framework. 4.9. Consultation with GIZ, CCC and other relevant government agencies. 4.10. Revision of vulnerability indices as necessary based on feedback, prior to pilot-testing.	By 4th week of June
CLUP-CDP CC Vulnerability Indices; NCCAP CC Vulnerability Indices	5. Review and identify current information management and M&E system at the national and local levels that can be tapped to supply data and	Subsumed under step 4.4 to 4.6 of the Methods for Activity #4.	By 4th week of June

Outputs	Activities	Methods	Target Completion Date
	information to measure the CCVI (e.g. CBMS, LGPMS, BAS) and propose proxies when data and information are not readily available.		
CCVI Pilot-testing	6. Support the pilot-testing of the set of CCVIs (developed under item 3) in the: a. Ecotown Framework Demonstration sites in Siargao Island, Surigao Del Norte (i.e., Del Carmen, San Benito, San Isidro, Pilar)	6.a.1. Field visit to Siargao sites - Consultations/Follow-up on progress of existing ecotown VA and adaptation measures development - Demonstration of CCVI and workshops with relevant stakeholders; Relevant aspects: • How to determine and use the index • Where to get data or proxies • Who are the responsible people/offices • How will resources be made to the LGUs - Gathering feedback/comments, particularly noting what gaps may exist and how to overcome them to operationalize the CCVIs. 6.a.2. Post-fieldwork evaluation and revision	By 2nd week of July
CCVI Pilot-testing	b. Renewable energy sector under the Sustainable Energy strategic priority in the NCCAP	6.b.1. Providing input to introductory workshop on VIA and climate-proofing 6.b.2. Planning and providing input to a follow-up climate-proofing consultation or workshop in which the CCVI tools can be demonstrated (also according to the aspects above in 6.a.1) 6.b.3. Post-consultation evaluation and revision.	By 2nd week of July

Outputs	Activities	Methods	Target Completion Date
CCVI Technical Guideline	7. Prepare a draft guideline that would instruct how the CCVIs (and its proxies) can be embedded in regular M&E of LGUs for CLUP-CDP and national agencies for NCCAP.	7.1. Drafting of guidelines based on results of reviews and pilot-testing. Contents may include: - How to translate vulnerability assessments to indices - How to develop proxy indicators, if needed - What databases to use - How to design a regular monitoring and evaluation system 7.2. Submission of draft to GIZ and CCC for comments. 7.3. Revision of guidelines as necessary.	By 4th week of July
Final Report	8. Submit a final report detailing the accomplishment of tasks under this consultancy assignment	8.1. Writing and submission of report; 8.2. Debriefing at the CCC Office	By July 31

Completed Work/Preliminary Output

Of the tasks outlined above in the Methods section, the following have already been completed:

Activities 1, 2 and 3: This report signifies the completion of the literature review on vulnerability assessments and indices in the international and national communities, and the preparation of the Inception Report. However, we may continue to update and add new content to the literature review as these become available.

Activity 6a, Step 6.a.1: Dr. Rosa Perez has been continuously involved in the Siargao Ecotown VA project, and has completed the adaptation measures review. This already includes the development of impact chains and the identification of relevant indicators. (See Attachment A.)

Activity 6b, Step 6.b.1: Last April 25 to 26, 2013, an Orientation Workshop was held on Climate Proofing of Renewable Energy in the Philippines. Dr. Rosa Perez prepared materials for the session while Dr. Kendra Gotangco presented them and fielded questions. The materials covered the "Key elements of Vulnerability Assessments: applications in the energy sector", and "Examples of Impact/Vulnerability Assessments on Energy Systems: a Literature Survey." (See Attachment B.)

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