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# Climate Change Vulnerability Assessment Toolkit for Coastal Systems

The Philippines ranks seventh among countries listed as most vulnerable to climate change, with the rankings based on long-term trends of level of exposure and extreme events analyzed from 1990 to 2009 (Harmeling 2011). As an archipelagic country, more than 65 million people live within the country's 822 coastal municipalities and cities (World Bank 2005). These coastal municipalities and cities are densely populated with an average of 286 persons per square kilometer.

The national government commits to developing climate change adaptation measures to help local governments prepare for increased climate uncertainty and extreme weather events. In order to do this, vulnerability assessments (VA) are needed to identify specific and practical adaptation options and prioritize actions.

While several VA tools have been introduced to Philippine local governments, many of these tools are data-intensive, which limit their use to large governance scales (e.g., regional or national) and areas that have received considerable research, ecosystem, and socioeconomic assessments. In doing municipal planning on adaptation measures, local governments need tools that can evaluate vulnerabilities to the barangay or village level. These tools should also make extensive use of commonly collected and available data in coastal municipalities or cities to minimize additional costs for the cash-strapped local governments. Most importantly, these tools should be simple enough to be participatory and to enable transparency in communicating results.

Marine biologists and oceanographers from the University of the Philippines' Marine Science Institute, the De La Salle University, and staff of Conservation International Philippines initially addressed this need by conducting a comprehensive climate change vulnerability assessment of the Verde Island Passage.

The study used secondary data that were analyzed by veteran scientists. Several government agencies also supported the application of the VA methods to other parts of the country. However, tools from these experiences and applications could not be completed as most projects supporting the local scientists focused on implementation instead of tool development.

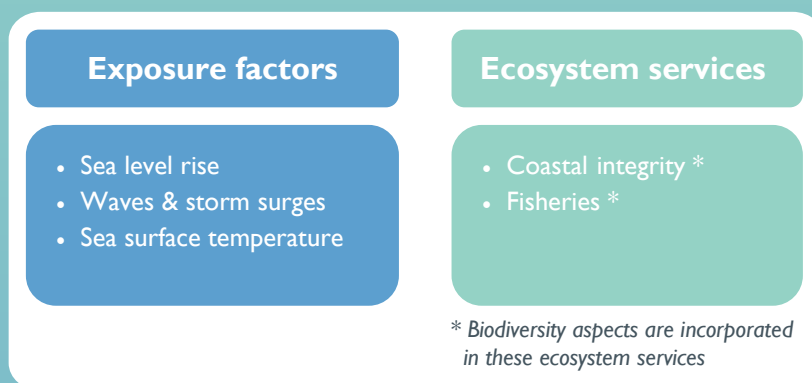
In response to this, the Coral Triangle Support Partnership (CTSP) provided a grant to the Marine Environment and Resources Foundation, Inc. in 2011 to develop climate change vulnerability assessment tools for coastal systems, with focus on fisheries and coastal integrity.



## Available VA Tools

Vulnerability assessment integrates social, ecological and economic information. The VA tools were designed according to the framework suggested by the Intergovernmental Panel on Climate Change wherein VA is a function of three elements: (1) exposure to climate change effects, (2) sensitivity, and (3) adaptive capacity. The scientists and developers envision the VA Toolkit to be a collection of “rubrics” wherein users score each site or barangay across several criteria that fall under “sensitivity” and “adaptive capacity.”

There are currently three VA tools available: (1) Integrated Coastal Sensitivity, Exposure, and Adaptive Capacity to Climate Change or ICSEA CChange; (2) Coastal Integrity VA Tool or CIVAT; and (3) Tool for Understanding Fisheries Resilience or TURF.



### What's included in the current version of the VA tools

ICSEA CChange is used for scoping and rapid reconnaissance of the vulnerabilities of integrated ecosystem services to synergistic climate change impacts. The current version of ICSEA CChange specifically incorporates sea level rise, waves and storm surges, sea surface temperature, and rainfall as exposure factors vis-à-vis fisheries and coastal integrity functions of the coastal and marine ecosystem. It also helps evaluate available information and level of data for finer and more detailed vulnerability assessments pertaining to fisheries and/or coastal integrity.

CIVAT and TURF are more detailed vulnerability assessment tools focusing specifically on coastal integrity and fisheries vulnerabilities, respectively. Compared to ICSEA CChange, these tools require additional information not commonly collected in rapid resource and socio-economic assessments and monitoring protocols. They most probably require additional field surveys to gather new data but these are simple methods that can be completed by local stakeholders after a brief orientation and training. The improved resolution, however, allows users to generate specific adaptation options from the different vulnerability factors identified. Coupled with a prioritization exercise, users can move forward to drafting climate change action and adaptation plans based on outputs of these two VA tools.

In addition to the VA Toolkit development, CTSP supports the application of existing versions of the VA tools to coastal barangays in Batangas through the municipalities of Calatagan and San Juan and in Occidental Mindoro through the municipalities of Lubang and Looc. CTSP also provides trainings on the VA tools for local governments and academic institutions within the CTSP priority geographies (i.e., Verde Island Passage, Palawan, and Tawi-Tawi).

## Towards adapted, better prepared coastal communities

The VA toolkit provides a rapid evaluation of different parts of the coastal system to various potential impacts brought by changing climate. By improving their capability to assess their area's vulnerability to climate change, local governments will be able to plan and refine existing management interventions, improve understanding of climate change issues, and improve their communities' resilience to climate change.

## VA Tools

## Description

### ICSEA CChange

Integrated Coastal Sensitivity, Exposure, and Adaptive Capacity to Climate Change

- Integrated vulnerability of coastal areas (i.e., fisheries, coastal integrity, and biodiversity vulnerabilities to synergistic climate change exposures)
- Scoping and reconnaissance
- Highly participatory and engaging local stakeholder knowledge
- Lower resolution of analysis
- Cannot provide specific adaptation options
- Can be used to compare general vulnerabilities across sites
- Assesses available data & information for use in CIVAT and TURF

### CIVAT

Coastal Integrity Vulnerability Assessment

- Vulnerability of coastal integrity to sea level rise and wave exposure
- High resolution of analysis
- Requires geologist to help interpret results and guide data collection
- Can identify specific adaptation options to improve coastal integrity

### TURF

Tool for Understanding Resilience of Fisheries

- Vulnerability of fisheries to wave exposure, sea surface temperature, and sedimentation
- High resolution of analysis
- Requires fisheries expert to interpret results and guide data collection
- Can identify specific adaptation options to reduce fisheries vulnerability to climate change



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For more information on this initiative, please contact:  
Evangeline Micalat, Policy and Development Senior Manager, Coral Triangle Initiative  
Conservation International Philippines  
#6 Maalalahanin Street, Teachers' Village, Diliman 1101 Quezon City, Philippines  
T: +63.2.9248235 | F: +63.2.4356446 | [www.conservation.org/philippines](http://www.conservation.org/philippines) | [www.cti.pawb.gov.ph](http://www.cti.pawb.gov.ph)

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