

COMPENDIUM OF TOOLS AND MODELS, FRAMEWORKS AND CASE STUDIES DEVELOPED THROUGH FOREIGN-ASSISTED PROJECTS

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TOOLS AND MODELS DEVELOPED THROUGH FOREIGN-ASSISTED PROJECTS

Project: Resilience and Preparedness toward Inclusive Development (RAPID) Program 1. ClimEx.db (Climate Exposure Database)

- A tool used for the collection and storage of local Climate <u>Exposure Data</u> for the CDRA process. Information from ClimEx.db may also be used by local government units for their development plans.
- A group of software applications that can be used to collect, organize, analyze, and visualize climate risk and exposure of households. The software includes the ClimEx.db survey application, geotagging application, ODK application for storing survey data, and QlikSense desktop application
- Inputs of the tools are the digital household survey data collected such as onhousehold socioeconomic components, buildings, and local production area.
- Tool outputs are map points, graphs and charts through the QlikSense Desktop application dashboard. Geodata points can be extended to polygon/shape maps using third party GIS software and be visualized in QlikSense desktop application.



Figure 1. ClimEx.db outputs visualized as charts, graphs, and maps through the QlikSense desktop

2. Climate-Adjusted Flood Modeling

- This tool can help identify areas that are of high risk to flooding due to stronger rainfall caused by climate change. This can also aid LGUs in informing their development plans.
- Mapping tool developed with PAGASA that identifies areas in the near-river basin municipalities of Dulag, Mayorga, and MacArthur that are at risk to flooding within 5,

25, and 100 return periods with projections in start of century, mid-century (2050), and end-of-century (2100).

- Inputs are field survey, hydrometeorological measurements, watershed delineation, hydrological and hydraulic models output data.
- Outputs are flood inundation projection maps.



Figure 2. Climate adjusted flood maps for the municipality of Dulag with return periods of (a) 5 years, (b) 25 years, and (c) 100 years.

3. Severe Wind Hazard and Risk Modeling and Mapping

- A tool that helps in identifying areas with high risk to increased typhon winds due to climate change. This tool can also guide the LGUs in planning and in the development of structural development guidelines.
- Mapping tool developed with PAGASA study identifies areas prone to tropical cyclone severe wind by modeling and integrating regional climate models, wind-speed-damage curve, building exposure, and building structure from ClimEx.db
- Inputs of the tools are regional climate wind hazard, wind-speed-damage curve, building exposure, structure and survey data from ClimEx.db
- Outputs are severe wind hazard maps.



Figure 3. Sample outputs of Severe Wind Hazard Mapping, (a) Probabilistic Wind Hazard Maps (b) Probabilistic Wind Risk Maps

4. National Inventory Report

- A tool that helps in identifying areas with high natural resources. Information from this also supports LGUs in development planning.
- a mapping tool developed with UP-TCAGP that identifies areas with high and productive Forest Resources, Agriculture and Soil Resources, Inland Water Resources, and Coastal and Marine Resources.
- Inputs of the model includes field survey, historical maps, satellite data
- Outputs are resources maps.



Figure 4. Mangrove species' contribution to carbon pool in Samar and Leyte



Figure 5. Mangrove forest cover map for Samar and Leyte

5. IT-based Post Disaster Needs Assessment Application (iPDNA)

• IT-based tool that will help in producing a baseline tool in assessing disaster damages and losses (Outputs are currently being requested from the project). Project implemented with OCD.

- iPDNA is an automated data collection and management system that uses a mobile and web-based data collection system which will facilitate data collection and consolidation for baseline and post-disaster indicators from various field sources.
- The iPDNA, which. It is easier to deploy, costs less, takes less time to complete, and compared to paper-based surveys, is less error-prone. The household and sectorbased data (from barangay, municipal, and regional offices) are then consolidated in a server and can be visualized and managed through a user-friendly and highly customizable desktop application.



Figure 7. Prototype of the iPDNA desktop app

Project: Building Low Emission Alternatives to Develop Economic Resilience and Sustainability Project (B-LEADERS)

- 6. HydroRAM (Hydrological Resource Analysis Modeling)
 - A tool that can help key government offices and LGUs quantify available water resources and project future water resources. The tool can also be used by national government agencies and local government units to regulate and manage water resource use.
 - This is simulation software used to model hydrological processes (e.g. surface outflow, precipitation, groundwater discharge) and assess impact to water flows and infrastructures in the future. It has three main components: AHD, SQLite database and the HydroRAM Model Itself.
 - Inputs to tool are the processing outputs of Analytical Hydrologic Dataset (AHD) such as watershed catchments and stream networks, and Climate Data Interpretation Tool (CDIT) such as time series rainfall and temperature.
 - The tool results to watersupply forecasts and maps that can help in managing water demand and allocation given a climate change scenario.



Figure 8. Some of the outputs of HydroRAM, (a) Mean Annual Generation Flow of Mindanao (based from B-LEADERS Case Study) (b) Flow Duration projection (Hydrological modeling)

Project: Transforming Tourism Value Chains

7. Resource Efficiency Data and Performance Tool Monitoring

- An excel-based tool developed to measures the resource efficiency of hotels, restaurants and venues for meetings, incentives, conferences and exhibitions (MICE)
- The tool requires MICE's information on their facilities, energy, water, waste, food purchases, food waste to measure their the GHG footprint, food GHG footprint, and food water footprint, among others

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Figure 9. Resource Efficiency Data and Performance Monitoring Tool of the project

Project: Sustainable Diner Project

- 8. National Eco-Labelling Program Green Choice Philippines (NELP-GCP) New Criteria For Food Service Establishments
 - A revised version of the 2013 NELP-GCP which aims to invite more restaurants using the NELP-GCP; the scope of the criteria includes the following restaurant types: (1) Quick Service restaurants; (2) Canteens and Cafeterias; (3) Catering Services; (4) Casual Dining establishments; and (5) Fine-dining restaurants.
 - The NELP-GCP requires food service establishments to comply with relevant regulations and laws under the four main categories under the mandatory requirements—(1) Food and Health Safety; (2) Nutrition; (3) Environmental Management; and (4) Resource efficiency.
 - The criteria also encourages continuous advancement of sustainability practices within their operations. This new addition to the criteria highlights innovative performance indicators in the four main categories and acknowledges other sustainability initiatives especially in the areas of green procurement, greenhouse gas emissions monitoring, and educational campaigns and trainings. These are voluntary, and the presence of these practices would signify a higher sustainability level for the restaurant.

Innovative Performance Requirements	Maximum Points	Weight (%)	Restaurant Actual Points	Weighted Actual Score (%)
1. Food and Health Safety	5	20		
2. Nutrition	6	20		
3. Environmental Management	8	30		
4. Resource Efficiency	6	15		
5. Other Sustainability Initiatives	5	15		
TOTAL POINTS SCORE	30	100		

Innovative Performance Level	Range (%)
1	60 - 69
2	70 -79
3	80 - 89
4	90 - 95
5	96 - 100

Figure 10. Scoring Sheet of the enhanced NELGP-GCP



Figure 11. Application process for the NELGP-GCP

Project: Building Climate Resiliency through Urban Plans and Design

9. CDRA Profiler and Dashboard

• A dashboard that simplifies CDRA processing and visualization for LGUs, tool is in excel.



Figure 12. CDRA Dashboard

FRAMEWORK AND CASE STUDIES DEVELOPED THROUGH FOREIGN-ASSISTED PROJECTS

Project: Building Low Emission Alternatives to Develop Economic Resilience and Sustainability Project (B-LEADERS)

1. Water Allocation Framework

- This framework that helps identify water resource use scenarios and projections by integrating various sectors water usage (agriculture, energy, and household).
- An analytical framework that quantifies benefits of water if used in food production, agricultural expansion, household use, and expansion of power technologies; determines which water use combinations is best.
- Input of the framework includes HydroRAM output data and maps, population data, water-dependent energy data, and agriculture data.
- The framework results to a food-energy-water nexus trade-off analysis that projects water-use scenarios and benefits. The resulting analysis helps decision-makers develop efficient water resource management policies and balance priorities among the water-energy-food nexus.



Figure 13. Details the process of the Water Allocation Framework, the inputs and outputs that the framework produced.



Figure 14. Projected water balance maps developed through the framework.

Project: Climate Resilient Green Growth (CRGG)

2. Climate Resilient Green Growth Planning Framework

- A framework that provides a systematic and flexible approach to the incorporation of adaptation planning together with economic developent planning to produce climate resilient green growth plans that address multiple environmental, social, and economic goals.
- Defines baseline information on the social, economic, and environmental components of the LGUs, climate and hazard data.
- Results to action plans, laws, and policies to achieve climate resilient green growth.



Figure 15. CRGG Planning Framework Roadmap

Project: Resilience and Preparedness toward Inclusive Development (RAPID) Program

- 3. CC/DRR Public Expenditure and Institutional Review (PIER)
 - A study that reviews the current climate change related policy and strategy programs, focusing expenditures of various national, regional, and local government institutions in relation to their efforts towards climate change and disaster management.
 - CC-DRR PEIR assessed the integration of climate change and disaster risk concerns within national and sub-national frames. The assessment was guided by the three key pillars: Policy Analysis, Institutional Analysis and Climate Public Expenditure Analysis (as shown in Figure xx); furthermore, the study review design was built based on UNDP's (2015) Methodological Guidebook for Climate Public Expenditure and Institutional Reviews (CPEIR), recommendations from CPIERS studies in Asia Paicifc, and discussions with the stakeholder (as shown in Figure 17)
 - The initiative should yield increased understanding and better prioritization of CC and DRR across public investment portfolios.



Figure 16. PIER Analytic Framework



Figure 17. Figure Design for the PIER

4. Baywide Coastal Zone and Land Use Framework/ San Pedro Bay – Leyte Gulf Basin (SPBLGF) Framework Plan

- A land-use and management master plan and framework developed to influence the 12 LGUs, integrating the ridge-to-reef approach incorporating land use and natural use of the LGUs and developing an Ecological Management Zone Use policy, through the support NEDA region 8
- The plan provides a strategic and policy framework for the sustainable and resilient development path for the management of the terrestrial, coastal, and marine resources of the SPBLGB. The Framework Plan presents comprehensive description of the physical, biological, and socioeconomic character of the SPBLGB and provides advice and guidance on the spatial structure and land and water use prescriptions to meet the intentions of a resilient and sustainable development path for the SPBLGB.



Figure 18. Proposed Ecological Zone Map for the San Pedro Bay – Leyte Gulf Basin

5. Comprehensive Development Plan + Guidelines

- Guidelines for local planners in integrating and mainstreaming Climate Change Adaptation-Disaster Risk Reduction in the local framework of planning (Project implemented with DILG).
- A supplemental guide to the existing CDP Illustrative Guide, CDP Preparation Guide, and Rationalized Planning System with a focus on providing information and steering the process of mainstreaming DRR-CCA in the CDP



Figure 19. Actions to mainstreaming CCA-DRR in the CDP process.

6. Project Development and Evaluation Manual

- Project output is a manual that helps mainstream Climate Change and Disaster Risk Reduction (CC/DRR) in project development and evaluation manual at a national level, project implemented with NEDA.
- Specifically, the objective of the manual is to maximize the use of existing relevant tools, indicators, and methods towards a CC/DRR sensitized -project evaluation in the following manner: (a) guide the NEDA Secretariat of the Investment Coordinating Council's in the process of reviewing investment proposals, (b) train the proponent agencies' project formulators and their economic evaluators in mainstreaming climate risk and adaptation while estimating the net returns from the proposed investment, and (c) orient relevant stakeholders with the process of integrating CC/DRR in the project evaluation process, particularly to monitor and validate parameters of the site-specific impacts.



Figure 20. Framework for Mainstreaming Climate Change and Disaster Risk Reduction into Project Development and Evaluation (Adopted from Tio, 2011)



Figure 21. Framework of CC/DRR-Based Project Evaluation Process Flow

Project: Sustainable Diner Project

7. Hotel Kitchen Toolkit: A Pilot Study In The Philippines

- The project supported the test of the WWF-U.S. Hotel Kitchen Toolkit, which aims the reduction in food wastage in FSEs, in the Philippines through the participation of the private sector in the food service industry.
- The study follow the following process: a) Partnership with SM Hotels and Conventions Corp. properties-Taal Vista Hotel and Pico de Loro Beach and Country Club, b) Presentation of the Philippine Situation on Food Waste/ Hotel Kitchen Toolkit, c) Creation of the Food Waste Management Team and Food Waste Mapping, d) Separation, Measurement, Recording, and Initial Data Analysis, e) Interventions to reduce food waste; d) Data Analysis.
- Initial results of the showed that there is a significant reduction in the food waste and loss.

8. Food-Sharing Network Program (FSN)

- A feasibility study that initially focused on the food donation program but, due to social, government, and cultural issues, refocused to a food-sharing network program.
- The study tested if FSN program is feasible in on collection and redistribution of food to reduce food waste. Results suggest that FSN can help reduce food waste and help redistribute excess food to the needy.



Figure 22. Food-Sharing Network Conceptual Model

9. Life-Cycle Analysis and Carbon Footprint Study for Greening the Food Service Industry

STUDY FRAMEWORK

- A study in six food establishments that calculates the carbon footprint of restaurant dishes during the procurement, operations, packaging, waste management, and wastage of the dish using inputs such as fuel for ingredients procurement and transport, electricity, fuel, and water.
- Initial results suggests that in the study participant food establishments, food service preparations of dishes have the highest carbon footprint equivalent among the processes.



Figure 24. Study Results

- 10.Cost-Benefit Study of Integrating Sustainable Consumption and Production into Business Operations and Production into Business Operations of Food Service Establishments
 - A study that estimates via monetary units the social and environmental impacts of integrating sustainable consumption and production practices into business operations of FSEs
 - The study uses 4 sustainability areas (energy, water, waste, and food source), each with 4 indicators that will help monetize hidden benefits and costs ("externalities") of SCP practices. Furthermore, the study compares 4 scenarios for the Food Establishment, including the baseline scenario.
 - Study is still on-going.



Figure 25. Cost-Benefit Analysis Framework used in th Study.