CLIMATE & DISASTER EXPOSURE DATABASE

(ClimEx.db) Primer




CLIMATE CHANGE COMMISSION PHILIPPINES

UNDP
Empowered lives.
Resilient nations.

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PROJECT CLIMATE
Twin Phoenix

Understanding disaster risks in a changing climate,
Working towards sustainable recovery.

Challenge of a changing climate

The Philippines is greatly vulnerable to the potential impacts of climate change given its geographical location, archipelagic formation, biophysical characteristics and population distribution. Experiences in the past demonstrate the adverse effects of climate change and its impact on communities, the economy, and the environment. Recent typhoons have revealed the vulnerability of local communities to climate-related hazards such as severe storms, heavy flooding, rain-induced landslides, and storm surges. Typhoons Sendong (2011) and Pablo (2012), two of the strongest typhoons in recent years, brought widespread devastation to the cities of Cagayan De Oro and Iligan and the provinces of Compostela Valley and Davao Oriental. These typhoons displaced more than a million people, causing an estimated damage of close to P39 billion to housing, infrastructure, agriculture and telecommunications. Without concerted action from all sectors at all levels, the challenges the country will face as a result of climate change are expected to intensify.

Implementing DRR-CCA at the local level

Disaster risk reduction and climate change adaptation (DRR-CCA) have become national priorities due to severe climate-related hazards in recent years. The country enacted a number of national policies to address the potential impacts of disasters and climate change such as the Climate Change Act of 2009 (RA 9729), the National Framework Strategy for Climate Change, and the National Climate Change Action Plan (NCCAP).

At the sub-national level, local government units (LGUs) are mandated to integrate DRR-CCA concepts in all aspects of policy and plan formulation, and program and project implementation. It is a reality that people at the local level are directly affected by the impacts of hazard or disaster and are considered more exposed to and at risk because of more frequent intense hazard events. It is therefore imperative that climate and disaster risk reduction actions and adaptation strategies be formulated and implemented at this level.

On this aspect, Project Climate Twin Phoenix assists LGUs by strengthening their capacities for DRR-CCA and enhancing their planning and local decision-making processes. It provides knowledge-based inputs to assist local governments and educate communities when making long-term planning decisions on how to sustainably develop their localities while keeping it safe and secure from the effects of a changing climate.

Assessment of climate and disaster risks is the first step in effectively implementing local level DRR-CCA initiatives. At the city and municipal levels, detailed evaluation of potential risks is needed because the concept of risk resulting from hazard events cannot be understood easily without sufficient information. Establishing and managing consolidated information on exposure and vulnerability is a critical component in developing future plans and programs.

Climate and Disaster Exposure Database (ClimEx.db)

What is it and why do we need it?

In order to assess and analyze the risks people face, their dwellings, and places of economic activity, it is important to have a set of data that will describe their characteristics in relation to hazards and climate change. A computerized system containing consolidated information on exposure, vulnerability, and resilience must be developed to be able to visualize the risks associated with past, current, and potential catastrophes. In order to generate this information, a database must be created, taking into consideration a wide range of social, political, technical, and economic fields.

The conventional methods of gathering, encoding, and analyzing data take a lot of time and effort. The solution is to create a mobile surveying tool which can gather, in an organized way, data required to assess risks and exposure of households, buildings, and production areas for local level development planning and program implementation. This is where ClimEx.db comes in.

Climate and Disaster Exposure Database (ClimEx.db) is a tool designed to help communities and local governments in planning their land use and development while incorporating measures to adapt to the effects of climate change in their localities. As a disaster risk assessment tool, the ClimEx.db can be used to assess a locality's existing risks and systematically report on exposure data gathered through the system. ClimEx.db ensures that communities get the right information at the right time to take the right action.

How does it work?

◄ ClimEx.db Tablet

▲ Surveys Available in the Application Tablet

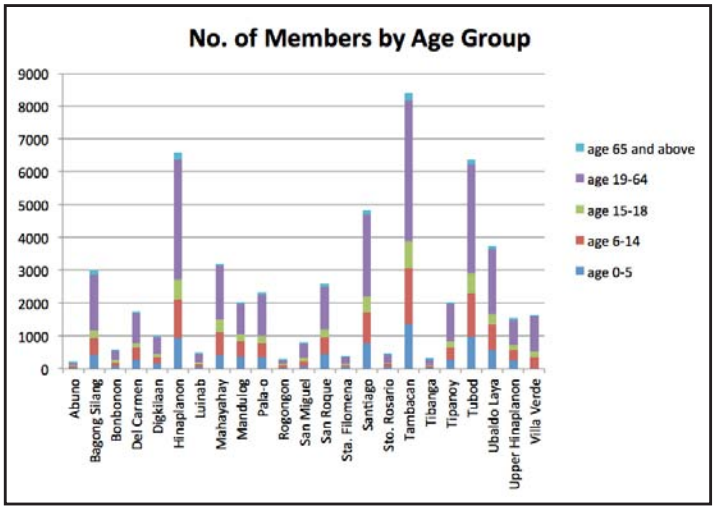
To capture data, ClimEx.db includes a custom-made application (app) installed in an Android tablet, a user-friendly device perfect for conducting surveys.

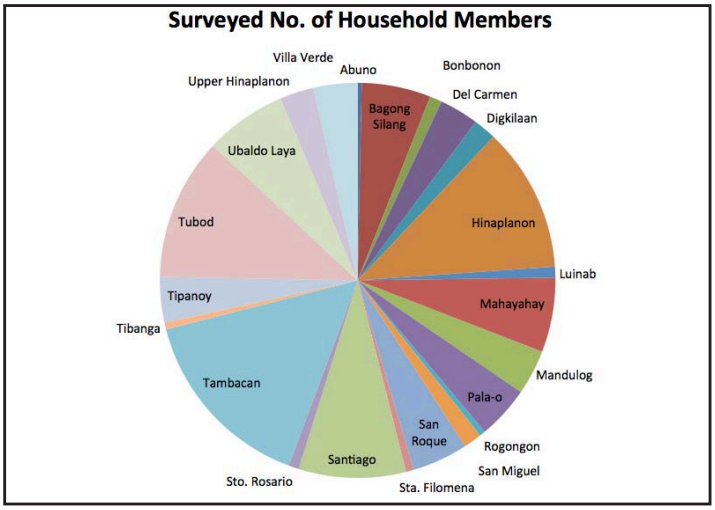
Data is to be collected from field surveys to be conducted through direct-questionnaire interviews, taking of photographs, and capture of geographic coordinates from the GPS or maps built into the app. Three types of surveys may be created and recorded through the application: household survey, building survey, and production area survey. The survey will be undertaken with the supervision and coordination of the LGU planning office and/or the partnering academic institution. A User's Manual as well as a Technical Manual has been developed to guide the survey personnel and future users of the database.

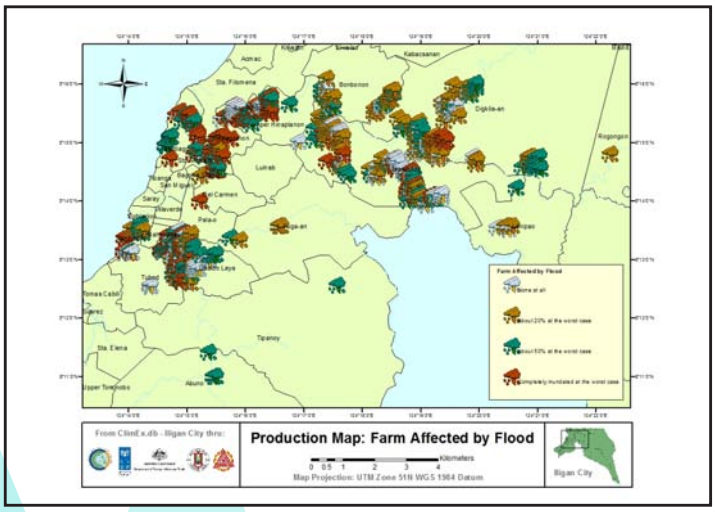
The database will be used mainly to assess climate and disaster risks by estimating the number of people that will potentially be affected in the event of a disaster, estimated cost of damage to properties, and losses in income from stoppage of economic activities. It serves as a guide for the formulation of local policies for risk prevention and emergency procedures especially in preparing for worst-case scenarios that account for potential impacts of climate change.

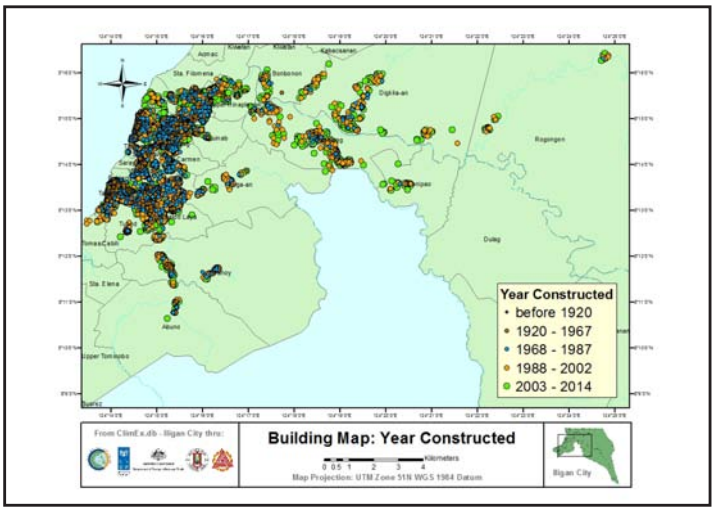
The implementation of ClimEx.db underwent the following phases of information technology development: conceptual and logical design, development and implementation (programming), installation and testing. Trainings and orientation of surveyors and database managers are being conducted to guide users on the implementation, installation, maintenance, and operation of the ClimEx.db and on the actual conduct of a field survey in target sites.

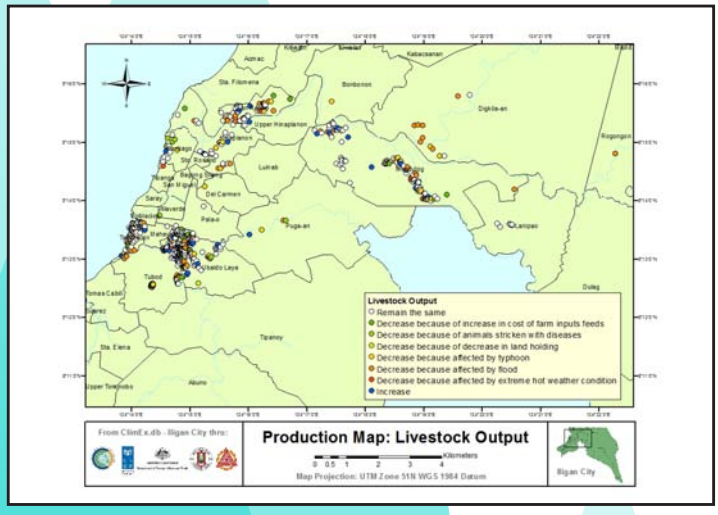
Figure 1. Sample ClimEx.db outputs for Iligan City

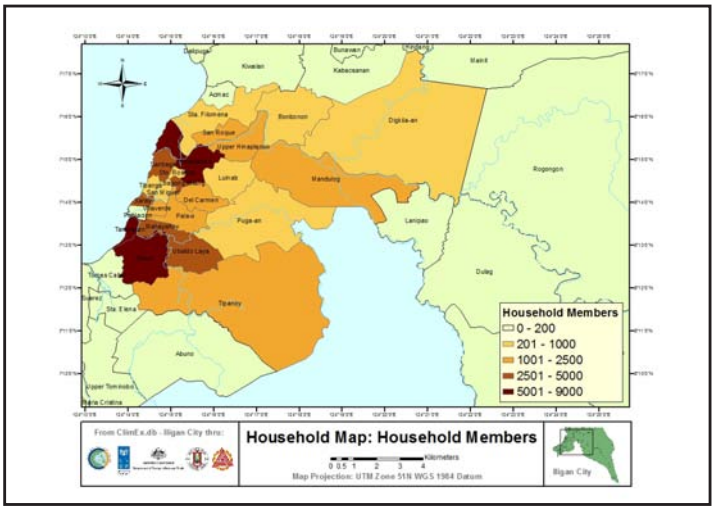


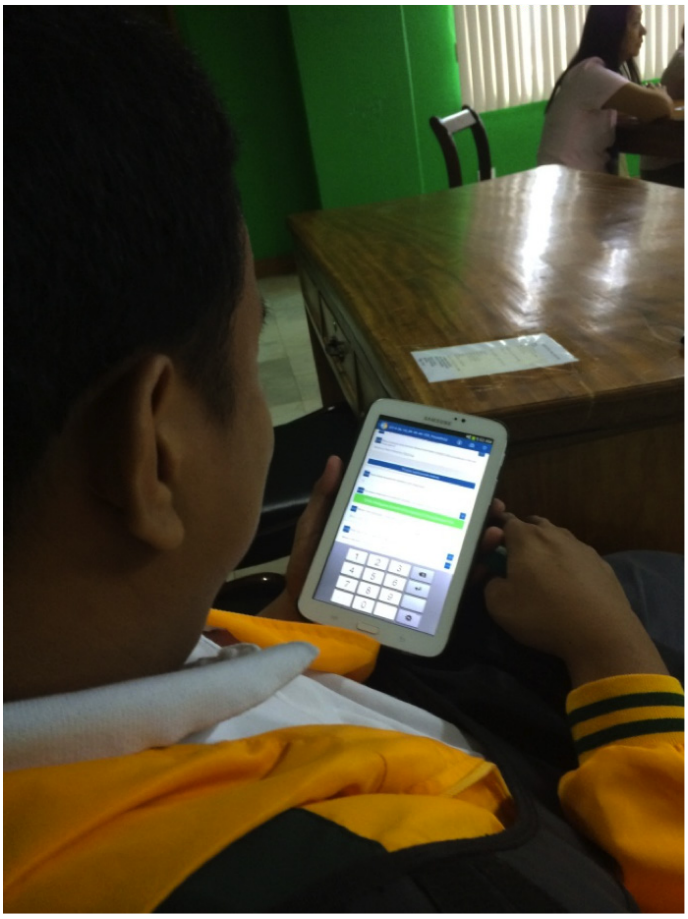












Trainings are designed for city planners and stakeholders involved in disaster risk reduction and management to strengthen their technical knowledge in assessing and managing their own risks.

In 2013 up until early 2014, ClimEx.db was successfully piloted in Iligan City. Other target sites are Cagayan de Oro City, New Bataan in Compostela Valley, and Baganga, Boston and Cateel in Davao Oriental, with likely expansion to other project sites.

ClimEx.db implementation in Iligan and Cagayan de Oro was made possible through partnerships with the City Government of Iligan, the City Government of Cagayan

De Oro, Mindanao State University-Iligan Institute of Technology (MSU-IIT) and Mindanao University of Science and Technology (MUST). Project Climate Twin Phoenix supported the establishment of a GIS resource center in MSU-IIT to provide learning services to the local government units in the area. In areas hit by Typhoon Pablo, implementation will be done in collaboration with University of the Philippines-Mindanao.

Partnering with academic institutions in the joint usage and development of ClimEx.db is seen as a strategic move to increase the capacity of partners at the local level. This will be accomplished through the conduct of training on gathering exposure data and GIS and a limited support for graduate students conducting research on disasters and climate change. Local state colleges and universities will serve as trainers to be able to replicate the process in other areas in the region.

The Path Ahead for ClimEx.db

Integrating risk into decision-making and development planning

ClimEx.db is part of a broader program being implemented by Project Climate Twin Phoenix to enable the cities of Cagayan De Oro and Iligan and the provinces of Compostela Valley and Davao Oriental to cope with climate change. The project is envisioned to be the first stage of a more comprehensive and long-term capacity development program for cities and municipalities to manage risks from climate change and climate-related natural hazards

Eventually, ClimEx.db will be used to provide baseline data for measuring disaster risk reduction and climate change adaptation. Risk assessments and vulnerability information may be used in the preparation of comprehensive land use plans and other DRR-CCA programs. When implementation is completed, the exposure database shall include an inventory of evacuation sites and spaces for use during disasters; and existing policies and ordinances pertaining to disaster planning, response, rehabilitation and recovery. Later on, the data from the exposure database shall also be used to design climate-resilient livelihood programs that will guide future social protection programs.

Since the exposure elements surveyed in ClimEx.db are geo-referenced, it is now possible to overlay them with hazard maps to determine degree, extent and distribution of hazard exposure along with their vulnerability attributes. This will complement thematic maps such as those for infrastructures that are critical during disasters like emergency facilities and lifelines, transportation network and protection services (police stations, fire stations etc.).

ClimEx.db will be integrated with existing databases being maintained by national government agencies and local government units such as the Climate Change and Disaster Risk Information System for Planning (CRISP), which is being assisted by Project Climate Twin Phoenix and hosted in NEDA Region 10. This will also ensure compatibility and consistency with existing data encoding and sharing standards. In the long run, it is envisioned that ClimEx.db shall serve as the platform for systematizing and unifying administrative data collection by local governments.

The database can be used to improve urban and regional planning by refining land use maps and providing insights on areas where developments are being proposed. Land uses within settlement areas may now be defined at the building level while production areas like agriculture can be described according to crops grown as well as possible threats from natural hazards.

ClimEx.db, when applied to infrastructure planning and urban development, will be used to decide on retrofitting strategies and setting up local building standards. The exposure data will be used to define requirements for drainage improvement, retention/detention ponds for subdivisions and other forms of land development. Building and occupancy permits, business permits, and locational clearances filed and processed at the local government level could be encoded and cross-checked with ClimEx.db.

ClimEx.db provides valuable information in assessing the vulnerability of local communities by comparing damage and loss records resulting from actual events. This can be used to identify priority projects for increasing social and economic resiliency. Risk estimates may also guide risk transfer mechanisms such as insurance.

Looking into the future, ClimEx.db provides the impetus for concerted action between local governments and communities to continue to feed data into the system and improve its value to become a resource for decision makers in planning for a sustainable future amid a changing climate.

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