ABOUT THE BCRUPD PROJECT

Building Climate Resiliency through Urban Plans and Design (BCRUPD) is a capacity building project funded by the German government's International Climate Initiative (IKI), and is being implemented by the UN-Habitat in partnership with the Department of Human Settlements and Urban Development (DHSUD), Department of Interior and Local Government (DILG), Climate Change Commission (CCC), National Economic and Development Authority (NEDA) and the League of Cities of the Philippines (LCP).

It aims to support the Philippine Government in improving policies, regulations, and capacities to adapt to climate change through the promotion of climate-responsive sustainable urban development plans and designs.

Building Climate Resiliency
Through Urban Plans and Designs

Cagayan de Oro is the regional capital that anchors the development of the Northern Mindanao Region. Poised to take its place as core city of Metropolitan Cagayan de Oro (Metro CDO), this highly urbanized city is home to 675,950 people, a number that is projected to double by 2036.

Cagayan de Oro covers 57,851 hectares with built up areas located mostly along the coast and adjacent plains. The urban sprawl is spreading steadily from the historic downtown business hub to the relatively younger uptown communities and emergent economic districts.

The city serves as the commercial and economic center and transshipment hub of the region. Located along the central coastline of Macajalar Bay, facing the heart of the Philippine archipelago, Cagayan de Oro is the most cost-efficient entry and exit point to the island of Mindanao, a vital logistics link to the agricultural powerhouse that is Bukidnon and the thriving economic zone and international container terminal that constitute the crown jewel of Misamis Oriental.

Local Chief Executive
Mayor Oscar Moreno

Supported by:

Based on a decision of the German Bundestag
**Climate Information and Issues**

The City employed a ridge-to-reef perspective and an ecosystem-based approach.

- The green strategy component focuses on nature-based solutions which emphasizes the conservation, sustainable management, and restoration of natural ecosystems, and increasing their resilience against the impacts of climate change.

The blue strategy is a water sensitive urban planning and design approach. Planning interventions are informed by topographic and seasonal temperature which may trigger the further heating of the built environment.

**Projected Increase in Rainfall**

Projected increase in rainfall may trigger extreme rainfall events causing occasional floods in the urban areas. Annual rainfall patterns may also affect local potable water supplies, water availability in agricultural areas and the challenges of balancing water requirements of various users dependent on this essential resource.

**Impending Drought**

The City may also experience two plausible scenarios as a result of potential changes in seasonal and annual rainfall patterns. Reduction in annual rainfall may affect local potable water supplies, water availability in agricultural areas and the challenges of balancing water requirements of various users dependent on this essential resource.

**Increase in Rainfall**

Annual rainfall patterns may also increase compared to the current baseline. This plausible rainfall scenario provides development benefits to the local water supply and water availability for agricultural production. Projected increase in rainfall may trigger extreme rainfall events causing occasional floods in the urban areas.

**Extreme Hazards**

PAGASA also projects a slight reduction in the frequency of tropical cyclones but slight increase in intensity which may trigger extreme hazards such as floods and storm surges affecting coastal, riverside areas in the Central Business District. This can trigger rain-induced landslides in upland and steep sloping areas.

**Citywide Adaptation Strategy and Major Climate Action Projects**

- **Heat adaptive built environment**
  - Climate resilient and adaptive districts and buildings
  - Safeguarding key infrastructure
  - Climate proofing sites and buildings
  - Improving drainage design
  - Developing institutional capacities for effective climate action

- **Resource Production**
  - Promoting Climate Adaptive Natural Resource Production

- **Afforestation and Reforestation Program**
  - Project cost: PhP 21,500,000.00
  - Increasing forest cover that serves as carbon sink, natural protection or rain-induced landslide, and watershed protection.
  - The project is a multi-stakeholder effort to create livelihood for upland dwellers.

- **Establishment of Sloping Agricultural Land Technology Farms**
  - Project cost: PhP 4,000,000.00
  - Managing slope instability that threatens productivity of farms and slopes.

- **Managing Storm Water**
  - Project cost: PhP 59,850,000.00
  - Taking advantage of water as resource for agricultural production, improvement in drainage design, and basin-wide hydrology study.

- **Coastal Area Reforestation and Management**
  - Project cost: PhP 7,300,000.00
  - Natural approaches in enhancing biodiversity of the coastal ecosystem to develop sanctuaries, mangrove forests, and wetlands to prevent impacts from storm surges.

**Climate Information**

- More hotter days
  - Based on climate change projections, the city will experience increasing seasonal temperature which may trigger the further heating of the built environment.

- More power consumption, more greenhouse gas emissions
  - This can influence local power consumption patterns and mobility preferences which can trigger increased greenhouse gas emissions.

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The conceptualization of LUNHAW Project was based on the long-range and comprehensive climate adaptation strategy of Cagayan de Oro city. It is an urban design adaptation project that is divided into three major areas: Lunhaw Central, Lunhaw East and Lunhaw West. The Lunhaw is an integrated approach that combines several urban design elements such as urban grain, density and mix, streets and open spaces, façade and easements and buildings. It will also integrate water management in the Lunhaw East and West by establishing water impoundment facilities as complementing adaptation measures to flooding.

The main objective of the project is to help the vulnerable residents and businesses of the area adapt to the negative effects of climate change on their community. These effects — identified in the city's Climate and Disaster Risk Assessment — are urban heat stress and flooding.

The project scope will include the downtown Divisoria area and Isla de Oro as the Lunhaw Central, and will include the following interventions:

**Plaza Divisoria**
Divisoria Heritage Park, Tirso Neri St. and RN Abejuela St. will be converted into a walkable and bikeable park, improving its drainage system and permeability for groundwater recharge. Water feature will also be introduced to lower ambient temperature. Green building policies will be enforced to the peripheral buildings.

**Riverside Park**
The riverside will be composed of linear parks and urban forest to serve as buffer for flood and a venue for activities that could reconnect the public to the river.

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**THE LUNHAW URBAN DESIGN ADAPTATION PROJECT**

**SITE DEVELOPMENT PLAN**

**URBAN DESIGN FEATURES**

1. **STORE**
2. **RETAIN**
3. **RESIST**
4. **DELAY**
**SOCIOECONOMIC BENEFITS**

- **Reduced Flood Risk**
  - At least 7,000 businesses protected generating city revenue of around ₱146M per year

- **Sustain 21,000 jobs in the Lunhaw area**

- **Increased agricultural production with the provision of impounding basins**

- **Improved access to livelihood**
  - More rentable spaces will be made available with the new urban design.

- **Improved recreation and urban health**
  - Community open spaces accessible to the public at no cost will encourage people to exercise and hereby promote good health

- **Improved urban mobility**
  - Rationalized street alignments and widths within the Divisoria area will ease traffic and improve circulation patterns

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**FINANCIALS**

**PROJECT COST SUMMARY IN MILLION PESOS**

<table>
<thead>
<tr>
<th></th>
<th>Financial Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Divisoria and Isla de Oro</td>
<td>₱1,058.71</td>
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<tr>
<td>Direct costs</td>
<td>₱745.57</td>
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<tr>
<td>Indirect costs</td>
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<tr>
<td>Upland retarding basins</td>
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<tr>
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<td>Indirect costs</td>
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<tr>
<td>Upland impounding basins</td>
<td>₱53.62</td>
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<tr>
<td>Direct costs</td>
<td>₱39.62</td>
</tr>
<tr>
<td>Indirect costs</td>
<td>₱13.99</td>
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</tbody>
</table>

**TOTAL PROJECT COSTS**

₽ 1,130 M ($ 23 M)

**CITY TOTAL REVENUE**

₽ 4,112 M

(Fiscal Data of CDO, 2019)

**SUMMARY OF PROJECT ECONOMIC ANALYSIS**

<table>
<thead>
<tr>
<th>INDICATOR</th>
<th>RESULT</th>
<th>ACCEPTABLE RANGE</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ECONOMIC INTERNAL RATE OF RETURN</strong></td>
<td>14%</td>
<td>EIRR is more than SDR*</td>
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<tr>
<td><strong>ECONOMIC NET PRESENT VALUE</strong></td>
<td>₱290 M</td>
<td>NPV is more than 0</td>
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<tr>
<td><strong>BENEFIT-COST RATIO</strong></td>
<td>3.02</td>
<td>BCR is more than 1</td>
</tr>
</tbody>
</table>

* based on Social Discount Rate (SDR) of 10%

The project is projected to advance better walkability that will benefit approximately 20,891 residents by 2023. It also expects to yield savings in avoided flooding costs, result in increment in land value due to land and softscape developments, and financial revenues from rental of designated areas that will eventually translate to higher household income generated by mostly women small entrepreneurs in the community.