



**Lessons Learnt and Insights on
the Use of Sustainability Science in Support to
the Implementation of the Sustainable
Development Goals in Davao, Philippines**

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HELP Davao Network
Hydrology for Environment, Life, and Policy

The cover features a collage of images: a large blue and green leaf graphic on the left, a close-up of industrial pipes at the top right, two children looking at the camera in the middle right, and a glass of water with bubbles at the bottom right.

Outline

- 1) Strengths, challenges and opportunities of SETI capacities to support SDG implementation**
- 2) Initiatives to optimize the use of SETI for SDG Implementation at the national and subnational levels**
- 3) Recommendations on how to accelerate SETI for SDG implementation**



National and Subnational Development Plans

NATIONAL VISION

Ambisyon Natin 2040: “By 2040, the Philippines shall be a prosperous, predominantly middle-class society where no one is poor; our peoples shall live long and healthy lives, be smart and innovative, and shall live in a high-trust society.”

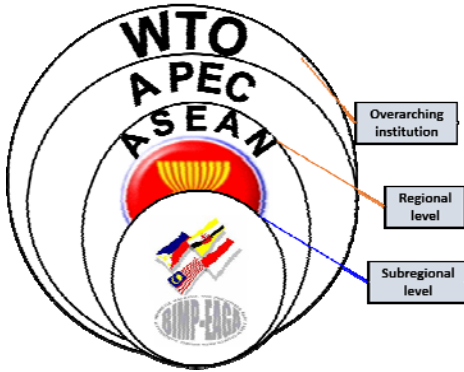


Mindanao 2020: A Peace and Development Framework 2011-2030



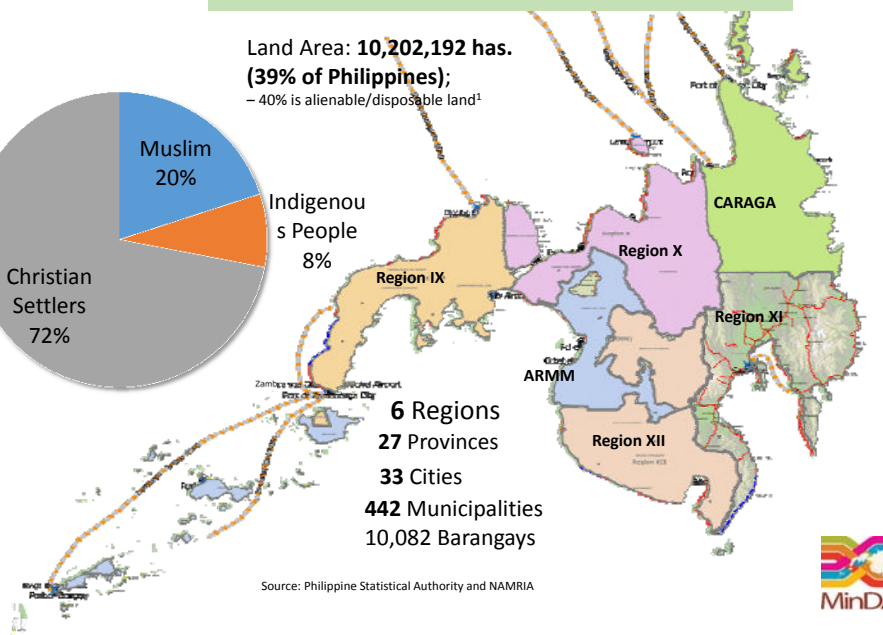
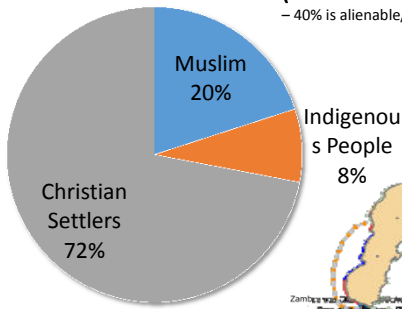
Provide **innovative solutions** that benefit Filipinos through **problem-focused approach** to **multi-disciplinary and multi-institutional R&D collaboration.**

Economic Integration Structure



MINDANAO's DEMOGRAPHY

Land Area: **10,202,192 has.**
(39% of Philippines);
 - 40% is alienable/disposable land¹



6 Regions
27 Provinces
33 Cities
442 Municipalities
10,082 Barangays

Source: Philippine Statistical Authority and NAMRIA



Official AEC Scorecard



Implementation of AEC Scorecard Deliverables under Phase I – III (2008 – 13)

ASEAN Member State	Implemented	Not Implemented	Implemented Ahead	Ongoing	Total Measures*	Implementation Rate**
Brunei	297	48	18	71	434	86.8%
Cambodia	290	56	17	72	435	84.6%
Indonesia	289	58	18	72	437	84.1%
Laos	287	57	16	74	434	84.2%
Malaysia	307	44	20	69	440	88.1%
Myanmar	294	51	17	72	434	85.9%
Philippines	302	47	19	71	439	87.2%
Singapore	304	38	19	69	430	89.5%
Thailand	307	43	20	69	439	88.4%
Vietnam	307	41	16	73	437	88.7%

Source: ASEAN Secretariat

5th

Assessing Competitiveness: Philippines vs ASEAN



How are we faring?

- 6th in per capita GDP
- 6th in Global Competitiveness
- 6th in Ease of Doing Business
- 6th in Enforcing Contracts
- 6th in Logistics Performance
- 7th in Starting a Business

Source: National Competitiveness Council of the Philippines

Assessing Competitiveness: Philippines vs ASEAN



How are we faring?

- **7th** in Information Technology
- **7th** in Global Innovation Index
- **8th** in Cost of Business
- **8th** in Dealing with Construction
- **8th** in Registering a Property
- **8th** in Ease of Paying Taxes

Source: National Competitiveness Council of the Philippines

Creating Productivity Index



How are we faring?

**Out of
24 Asian
Countries**

1. Laos (9th)
2. Singapore (10th)
3. Indonesia (12th)
4. Malaysia (13th)
5. Thailand (15th)
6. Vietnam (16th)
7. Philippines (18th)
8. Myanmar (22nd)
9. Cambodia (24th)

Source: Asian Development Bank Study –
Analyzing Creativity and Innovation in Asia

Assessing Competitiveness: Philippines vs ASEAN



Areas we fared better:

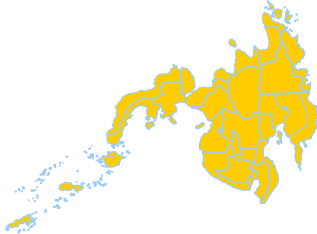
- **2nd** in Population
- **2nd** in Adult Literacy
- **4th** in Corruption Perception Index

Source: National Competitiveness Council of the Philippines

Mindanao and Palawan are part of BIMP-EAGA

BRUNEI DARUSSALAM, INDONESIA, MALAYSIA, PHILIPPINES
EAST ASEAN GROWTH AREA
(BIMP-EAGA)





Where is Mindanao in the context of ASEAN and Global Economic Integration?



Mindanao: A Modern Agricultural Center & BIMP-EAGA's Food Basket

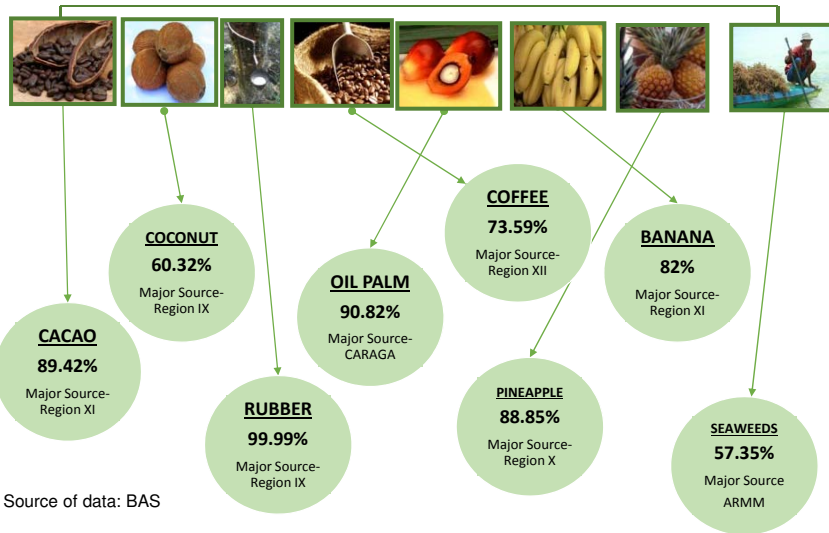
FOOD BASKET of the Philippines

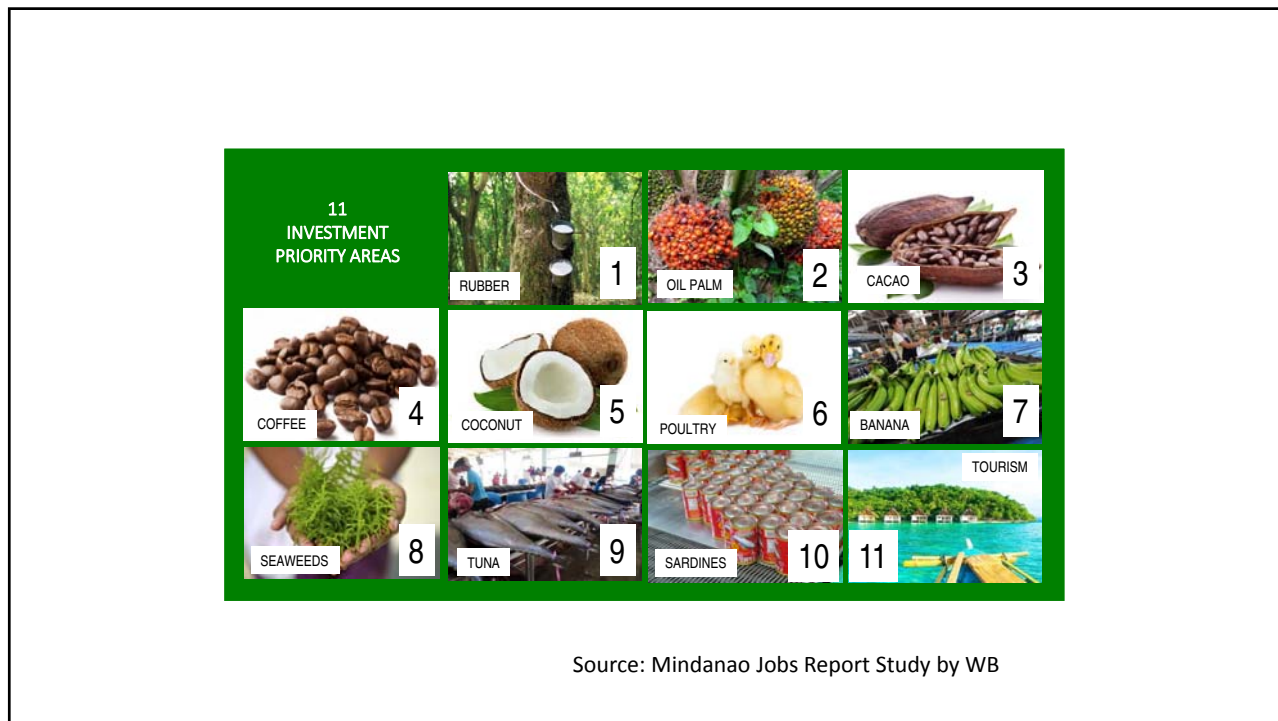
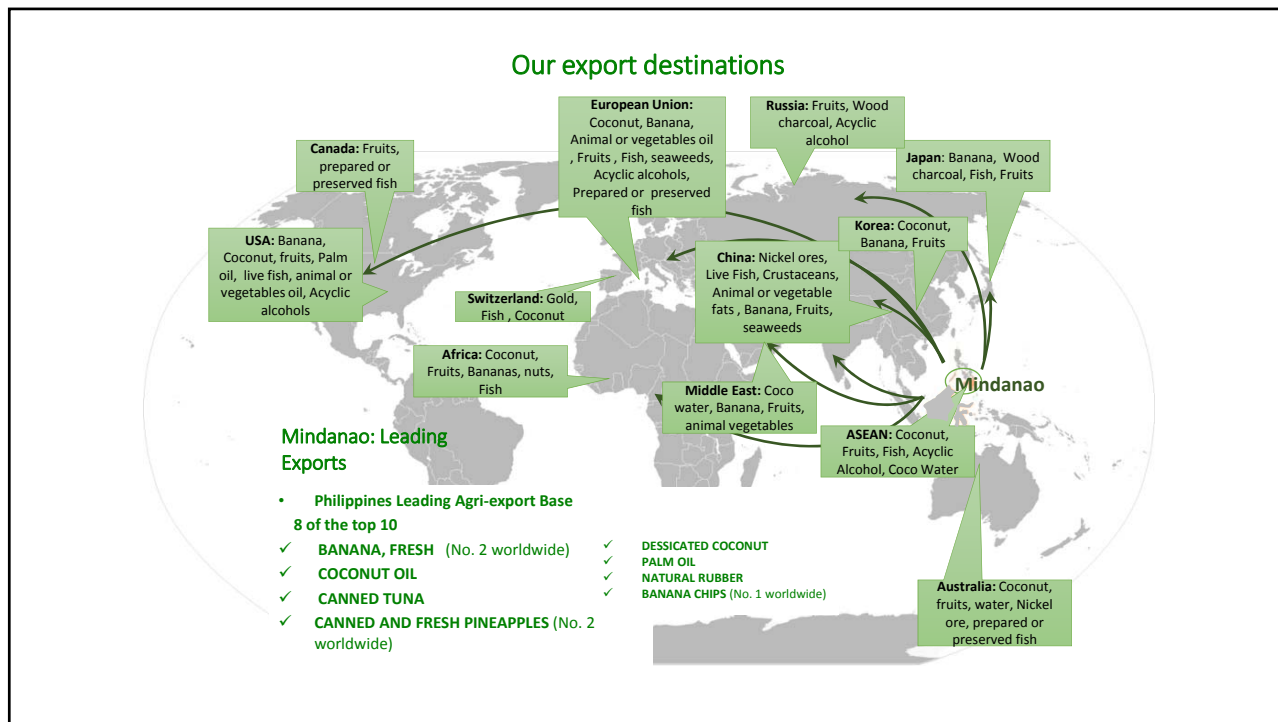


36%
of the
country's
farm area

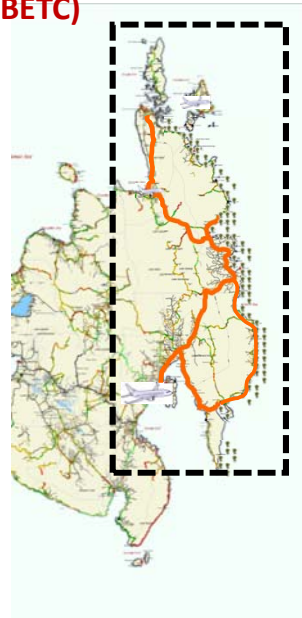
43%
of the country's
total farm
produce

Mindanao: Source of High Value Crops





Biodiversity and EcoTourism Cluster (BETC)



TOURISM

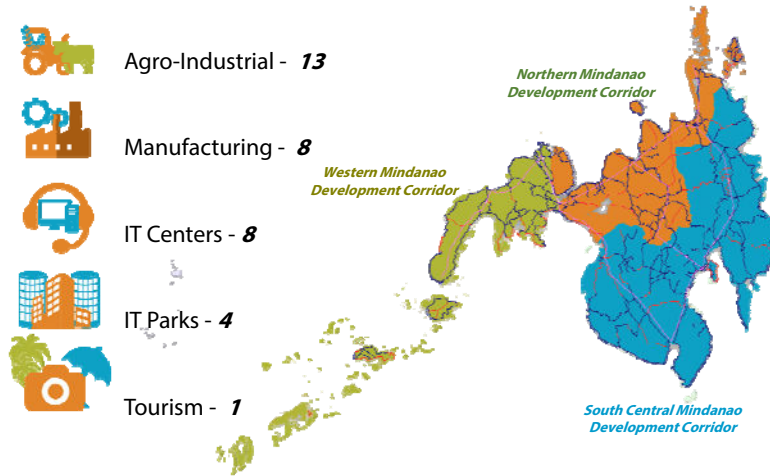
OBJECTIVES

Increase in tourist arrivals to the identified Biodiversity and Ecotourism Cluster

INVESTMENT OPPORTUNITIES

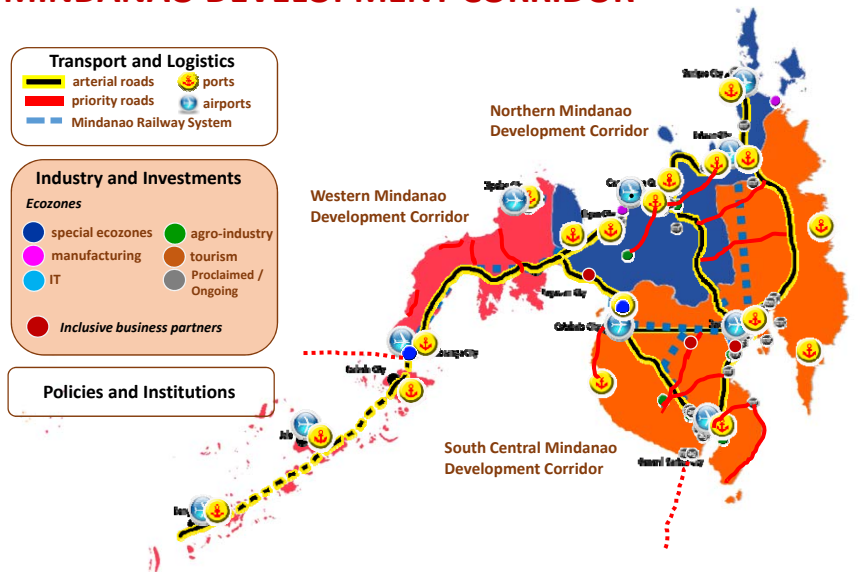
1. Accommodation and tourism-related facilities (hotels, resorts, theme parks, restaurants, etc.)
2. Tourism-related transport facilities (transport service operators, etc.)
3. Other tourism-related enterprises

34 Operating Ecozones in Mindanao



Source: Philippine Economic Zone Authority

MINDANAO DEVELOPMENT CORRIDOR






Davao/General Santos to Bitung, Indonesia Shipping Service launched last April 30, 2017

- This route is a more cost and time-efficient alternative to the usual Manila to Bitung route which would take about 5 weeks of shipping time. In contrast, direct shipping via the D/GB route will take only about minimum of one(1) day and a half up (excluding dock days).
- Name of Vessel: **M/V Super Shuttle RORO 14**
- Owner/operator: **Asian Marine Transport Corporation**
- Gross Tonnage: **6,974.00**
- Type of Vessel: **cargo/car carrier**
- will initially operate once a week.
- Capacity: **500 TEU**






The Philippines has a tropical and maritime climate, characterized by relatively high temperature, high humidity and abundant rainfall

We expect around 20 tropical cyclones to enter or develop within the Philippine Area of Responsibility every year, and 8 to 9 would progress to landfall


Tropical cyclones and intense rainfall of seasonal monsoons make **vulnerability to hydro-hazard a national priority concern** that can be associated with the increasing number of people, industries and infrastructures that are located in hazard-prone areas




Major Water Risks in the Philippines



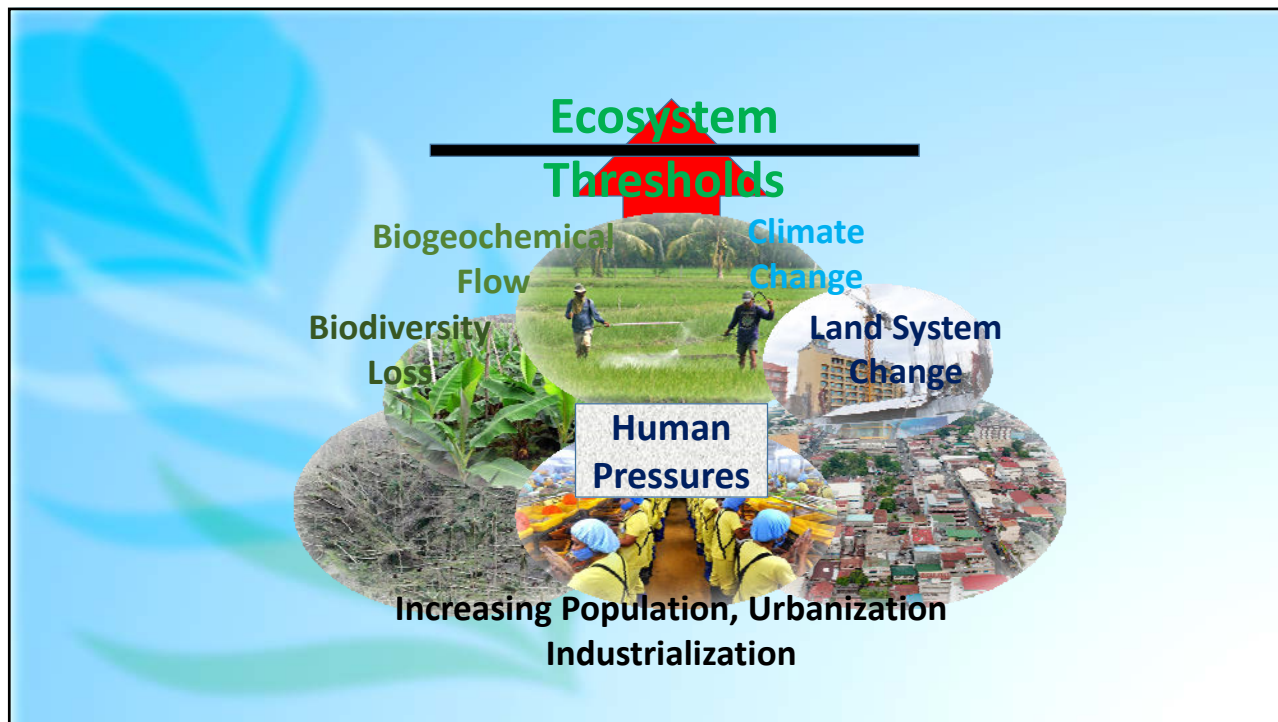
Drought



Flood



Water quality

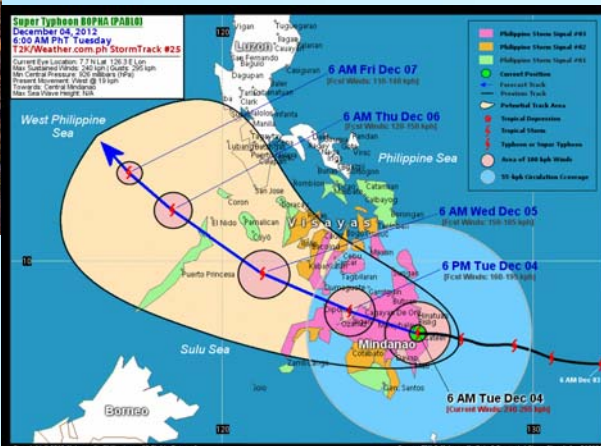


Typhoon Bopha (Pablo) 2012











Total Estimate Cost of Damage:
PHP36,949,230,987.07
 (agriculture, infrastructure, properties)
Total Individuals Affected: 711,682
families
Total Casualties: 1,607 Filipinos
Reported Missing: 834 Filipinos

Other immediate problems:
WASH, Food Security, Health and Safety, Shelter, Logistics and Communication, Education



The impacts of Typhoon Bopha (Pablo)

			
Infrastructure and Communication	Industries, Businesses, and Private Properties	Agriculture	Environmental Integrity
			
Education	Health and Safety	Livelihood	Lives

Flood Situation in Davao City Matina Pangi River (2011)



Total Estimate Cost of Damage: **PHP 11,000,000.00**
(infrastructure, private properties)
 Total Individuals Affected: **14,726 families**
 Total Casualties: **30 Individuals**
 Reported Missing: **1 Individuals**
 Other immediate problems:
WASH, Food Security, Health and Safety, Shelter



Davao City Flooding

in 2011

Thousands of families in 5 Baranggays (*Ma-a, Matina Pangi, Matina Crossing and Talomo Proper*) where drenched in **10 feet** high flash flood for several hours due to heavy rain that poured on June 28, 2011, forcing families to seek for higher and safer grounds

Damages of the Flash Flood Incident in Davao City Matina Pangi River (2011)



Infrastructures, Private Properties, and Businesses



Health and Sanitation, Safety, Households, Livelihood



Philippines: Chair of ASEAN 2017



#PRIORITIES

- A PEOPLE-ORIENTED, PEOPLE-CENTERED ASEAN
- PEACE AND STABILITY IN THE REGION
- MARITIME SECURITY AND COOPERATION
- INCLUSIVE, INNOVATION-LED GROWTH
- ASEAN'S RESILIENCY
- ASEAN: A MODEL OF REGIONALISM, A GLOBAL PLAYER



SCIENCE FOR CHANGE PROGRAM

Niche Centers in the Regions for R&D (NICER)

Culture-sensitive, conflict-sensitive STI ecosystem in Mindanao

- **Renewable Energy**
- **Biodiversity**
- **Engineering and Design**
- **Halal**
- **Water Resources**

SUSTAINABILITY SCIENCE

Harnessing S&T to get to sustainability – a focus on the dynamic interactions between nature and society

Brings together

- 1. Scholarship and practice**
- 2. Global and local perspectives from north to south**
- 3. Disciplines across the natural and social science, engineering, medicine, etc.**

Is problem-driven with goal of creating and applying knowledge in support of decision making for sustainable development

Demonstration Site for Sustainability Science:***Enhancing Resilience to Disasters of Urban Water Systems of Mindanao in the Philippines*****Components:**

- 1. Assessing the urban water supply system in Davao City**
- 2. Development of plan and demonstration of technologies**
- 3. Capacity Building and Raising Awareness on Climate Change**

15 year Vision for Sustainability Science***Components:*****Water****Land****Other natural resource*****Milestone indicators:*****1-5 years R&D translated into policies****6-10 Community building, behavioral change, IEC****11-15 Communities of practice**



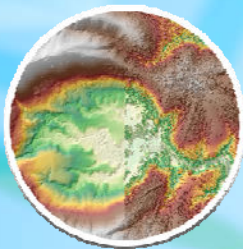
Central 911 functions as both a call center and a dispatch center that links residents with the emergency resources of the government. The Emergency Computer-Aided Dispatch (**ECAD**) system developed by Davao Light allows Central 911 to immediately locate the origin of emergency calls



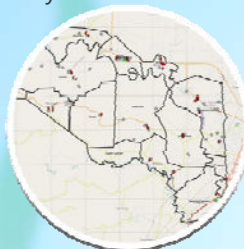
UNIVERSITY OF THE PHILIPPINES MINDANAO
PHIL - LIDAR 1

An expansion of the DREAM Program, aims to produce 3-D flood and hazard maps for the 2/3 of the Philippine river systems

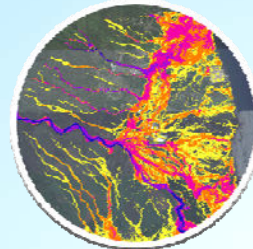
Aside from addressing disaster risk reduction and climate change adaptation, the resource information to be generated from this project will also be useful in providing the information requirements of various sectors in the country



Digital Elevation Model



Critical Facilities



Flood Map

<http://lidar1.upmin.edu.ph/phillidar1/>



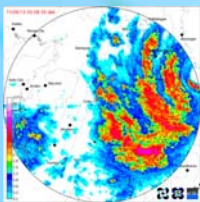
DOST Project NOAH

Nationwide Operational Assessment of Hazards



Project NOAH aims to provide:

- flood mitigation system, specifically targeting a 6-hour flood early warning system for communities along 18 major river systems;
- enhancement of geohazard maps and;
- enhancement of storm surge vulnerability maps



Project NOAH Website

noah.dost.gov.ph

The screenshot shows the Project NOAH website interface. At the top, there is a navigation bar with links for 'YOLANDA STORM TRK. FORECAST', 'TOOLS', 'LEGEND', 'BLOG', 'ABOUT', 'HELP', and 'REPORT A FLOOD'. Below this is a search bar and several dropdown menus for 'OVERVIEW' (MTSAT), 'WEATHER OUTLOOK' (PAGASA Cyclone Update), 'DOPPLER', 'WEATHER STATIONS', and 'FLOOD MAP'. The main content area features a satellite-style weather map of the Philippines and surrounding regions. A red box highlights Typhoon Yolanda, with a pop-up window displaying 'Typhoon YOLANDA Forecast Track: November 08, 2013 02:00 AM, Source: PAGASA'. The map includes a timestamp '11/07/13 02:57 PM' and 'MTSAT IR1'. On the right side, there is a social media feed with tweets from @dost_pasiga and @NCR_PRSD regarding the typhoon's impact.

WebSAFE :

In the event of a flood in **Quezon City, Metro Manila**, how many people might need evacuation?

WebSAFE, an impact assessment tool based on InaSAFE, is a joint effort of Project NOAH and The World Bank.

Population as of May 2010 Census: **2,760,000**
Annual growth rate: **0.01272**

1.4 Poverty Incidence

Continuous professional development for scientists, engineers, managers and policy makers in the water sector



Conducted several technical for a for local actors and stakeholders of water -continuing



Australian Awards Fellowship Program
"Disaster Risk Reduction for Community Resilience and Safeguarding Livelihoods in the Philippines"
14th October – 12th November 2015
International WaterCenter, Australia



Sent key participants to the NARBO IWRM Training Programs
2012, 2014, 2015

Developed the interdisciplinary material –
**Customized IWRM Guideline for
 Davao City and Davao Region** – which is a relevant
 input to water education initiatives

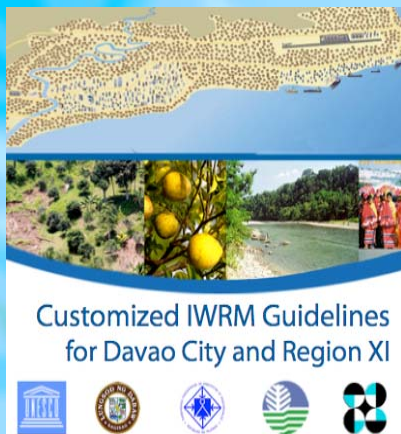


UNESCO IWRM Guidelines was localized and customized based on the actual experiences of Davao City and Davao Region thru the participative engagement of all stakeholders involved in planning of the Davao Water Action Plan and drafting the resolution for the Region-wide adoption of IWRM Guidelines.



Series of Consultations and Planning Sessions among a Full Spectrum of Stakeholders in Davao Region in 2011

Outcomes



- **Davao Water Partnership**
- **Water Vision for Davao Region**
- **5-year DRR Action Plan for Matina Pangli River**
- **Regional Development Council Resolution for the Adoption of IWRM Davao Water Partnership Action Plan**

Visit <http://rdc.nro11.neda.gov.ph/docs/iwrm.pdf>

Recommendations on how to accelerate SETI for SDG implementation

Enhance local capacities thru **Capability Building and Informal Education Programs** for key actors

Localized IWRM Training for River Basin Organizations and Local Government Units and distribution of the Customized IWRM Guidelines for Davao Region (June, 2015 and July 2017)



Increase local capacities thru Capability Building



BIMP-EAGA IWRM Forum for Peace and Development (October, 2014)

Localized IWRM Training for RBOs and LGUs and distribution of the Customized IWRM Guidelines for Davao Region (June, 2015)

Fellowship Program on Disaster Risk Reduction that build community resilience, safeguards agricultural livelihoods and reduces disaster recovery costs (20 fellows/water leaders from all over Mindanao, October, 2015)

Build Knowledge thru Research and Development



Title	Lead Researchers/Partners	Key Findings
Microclimate in Davao City	Van Larenstein Hall University, DOST XI, HELP Davao Network	Urbanization results to Davao City as Heat Island (increased temperature);Need for additional weather stations; and Need for improved data sharing and management
Tides and Floods and Davao City	Van Larenstein Hall University, DOST XI, HELP Davao Network	Need for improvement in drainage systems and flood control infrastructures; Need for improved reporting/recording of flood incidences
Assessment of the extent of implementation of standards and procedures for water safety in the Philippines	DOST XI, HELP Davao Network, UIC	Low level of implementation of water safety plans among drinking water providers ;Quality of drinking water in certain areas do not comply with the PNDSW of 2007; Need for development of a comprehensive advocacy, partnership and networking strategy to enforce PNSDW 2007
Assessment of the water situation and the safety of wastewater and sanitation in selected parts of Davao City	Oulo University, DOST XI, HELP Davao Network	Domestic and industrial waste management practices affect the level of contamination of the wastewater of the locations; There is need for reinforcement of the laws on waste management should be strengthened; Conversion from waste to energy is highly needed



Enhance **Understanding** thru Consultations



Series of Consultation and Planning Session among a Full Spectrum of Stakeholders in Davao Region for the Development of Customized IWRM Guideline and Davao Water Action Plan (2010, 2011)

Mindanao-wide consultation on priority issues and conflicts in water use and management (BIMP-EAGA Summit, October 2014) :

food, agriculture and fisheries; **domestic and industrial use**; **energy**; **climate change and hydro hazards**; **special concerns of Indigenous communities, women and youth**

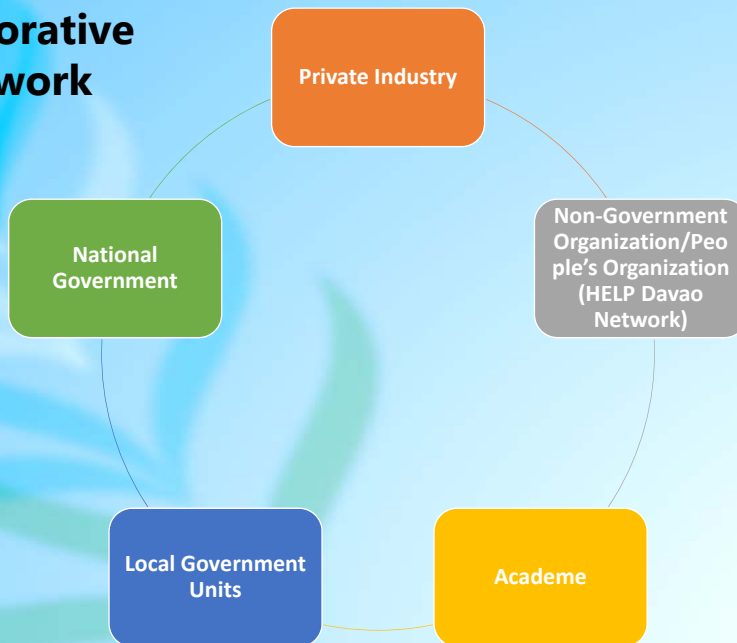
Consultation with Local Government Units and key stakeholders on demonstrating disaster resilience of urban water system in Davao City (2016)

Further Cooperation thru Partnerships



HELP Davao Network:
 A Multi-Sector Network of Volunteers Towards Wise Management of Davao River Basin

Collaborative Framework





Sustain STI **Implementation** thru Enabling Policies, Resolutions and Programs



- Regional Development Council Resolution for Adoption of IWRM Davao Water Partnership Action Plan
- BIMP-EAGA Resolution for the Mindanao-wide Adoption of IWRM
- Designation of Davao River as Water Quality Management Areas
- Organic Agriculture
- Marine Protected Areas
- Comprehensive Land Use Plan
- Watershed Code of Davao City
- Davao River Master Plan
- Rainwater Harvesting Ordinance
- Solid Waste Management Ordinance
- MindaNOW (Nurture our Water) Program
- Davao Water Partnership
- Banning of Aerial Spray

Lessons Drawn from Experiences

- (1) The need to customize and localize actions and plans to suit the existing norms and capacities.
- 2) Collective engagement and commitment of all stakeholders concerned.
- 3) The commitment and empowerment of primary actors who shall take lead in implementing actions.
- 4) The sharing and complementation of available information, human resources, technologies, infrastructures, programs and other resources.
- 5) Furthering knowledge thru research and development.
- 6) Sustaining implementation efforts thru enabling policies and frameworks.