

WATER RESOURCES IN THE PHILIPPINES: Status, Challenges and Opportunities

SCPW

Joy Nostalgia Hotel Manila

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National Water Resources Board

Presentation

- * **NWRB Functions**
- * **Water Resources Status**
- * **Water Resources Management: Issues and Challenges**
- * **Water Resources Management: Initiatives and Opportunities**

NWRB Functions

1. Policy Formulation and Coordination

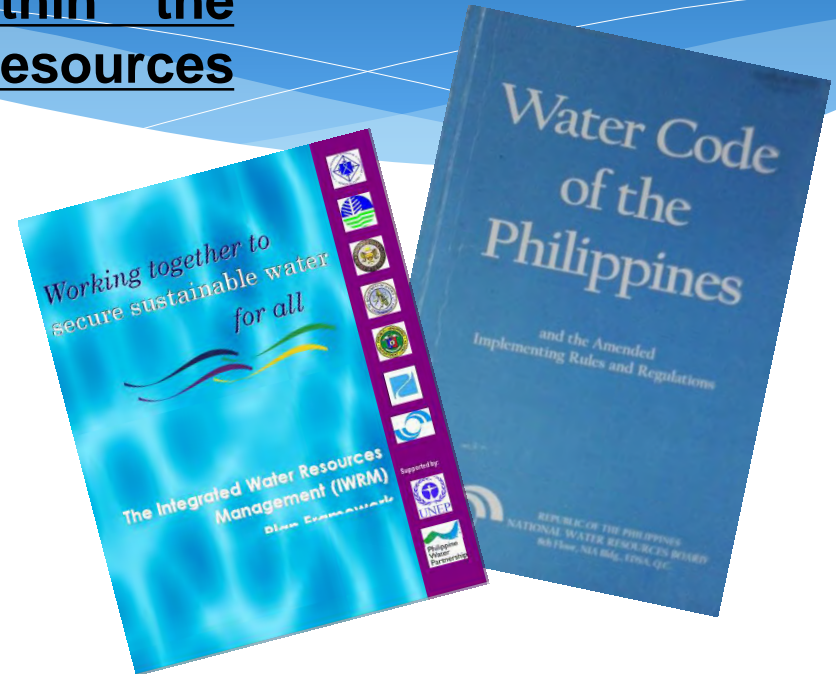
Formulate policies and plans within the framework of Integrated Water Resources Management (IWRM)

Plans

- 2007 Philippine IWRM Plan Framework
- IWRM Plan in Pampanga RB **(completed)**
- Groundwater Management Plan in Water Constraint Cities **(on-going)**
- Comprehensive Water Resources Assessment of Major River Basins **(on-going)**

Policies

- Groundwater Allocation for Metro Manila and surrounding areas
- Groundwater Allocation for Metro Cebu
- Granting of Water Rights over Surface Water for Hydropower Projects requiring more than 80% dependable flow

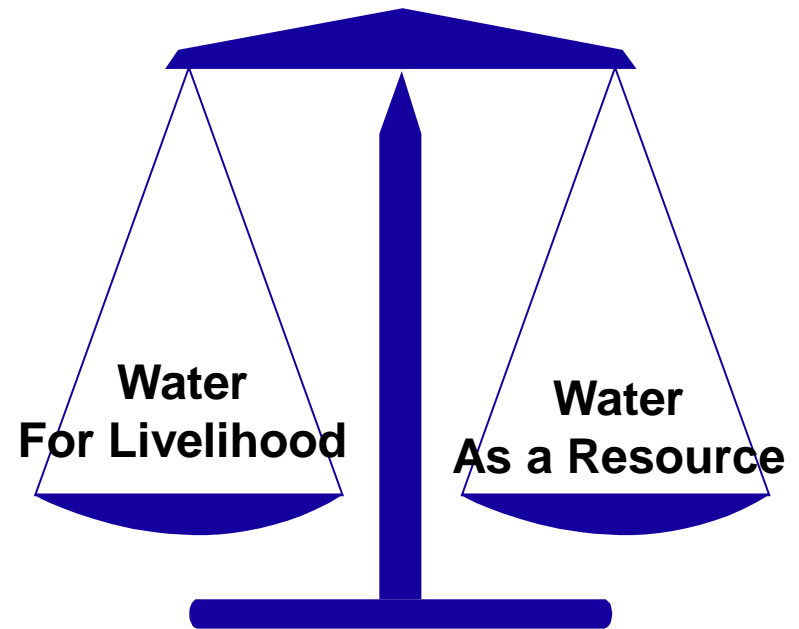


Amendment to the 1976 Water Code of the Philippines **(on-going)**

NWRB Functions

2. Resource Regulation

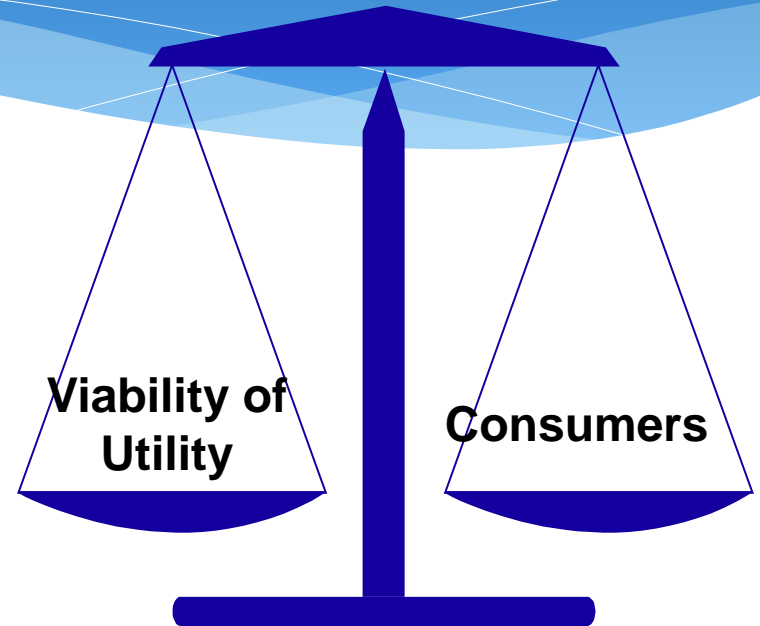
- Conserves and protects all water resources
- Regulates water utilization and allocation based on policies consistent with beneficial use and sustainable development.
- Regulation of water use through the water rights system



NWRB Functions

3. Economic Regulation

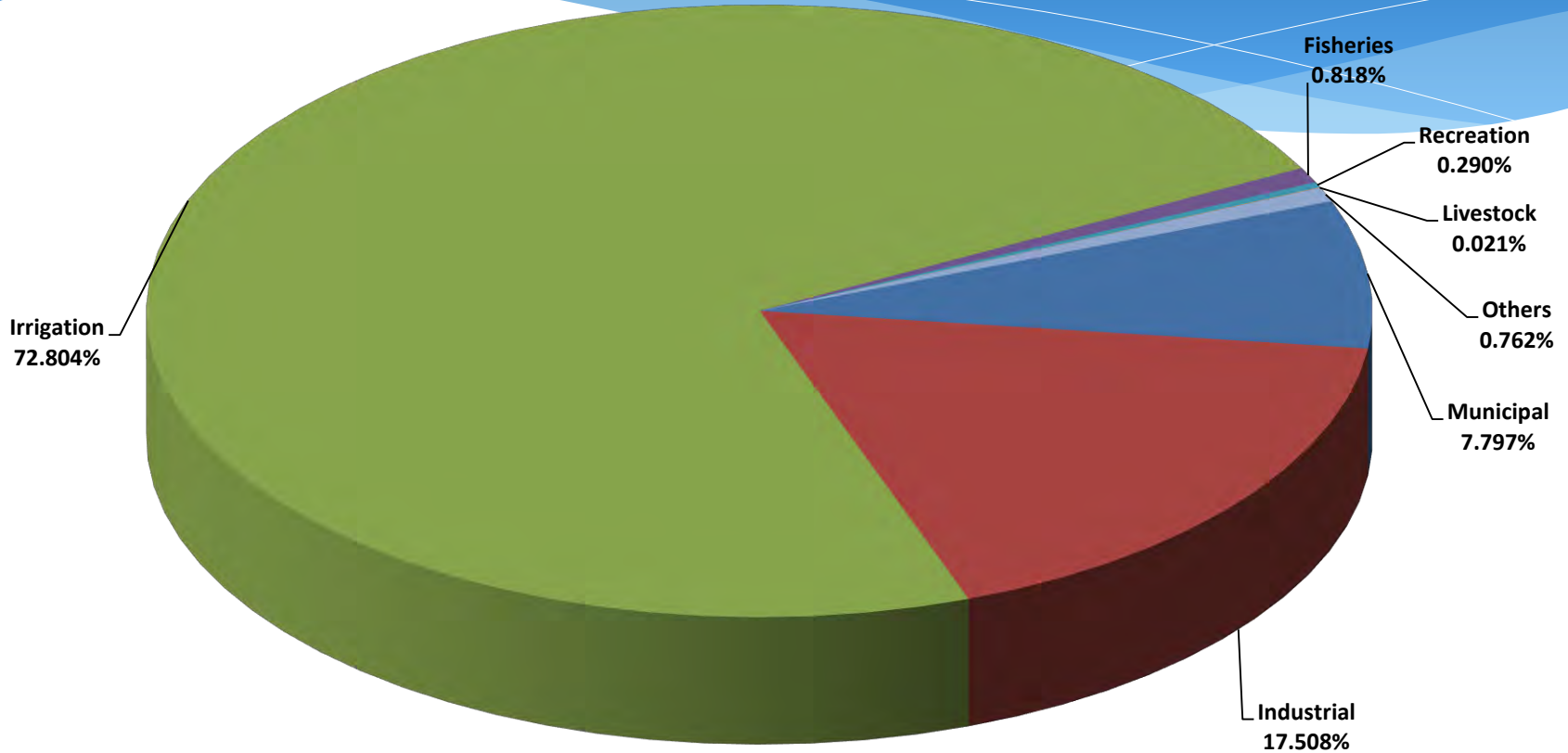
- **Protects consumers and safeguard the economic viability of water utilities by:**
 - **determining service standards and targets**
 - **tariff levels and schemes**
 - **monitoring and measuring company performance**
 - **enforcing compliance**
 - **imposing sanctions**
- **Authorize the operation of private water service providers by granting Certificate of Public Convenience (CPC)**



Local Government Systems
Rural Water Associations
Cooperatives
Private Sector Utilities
Bulk Water Suppliers
Water Peddlers

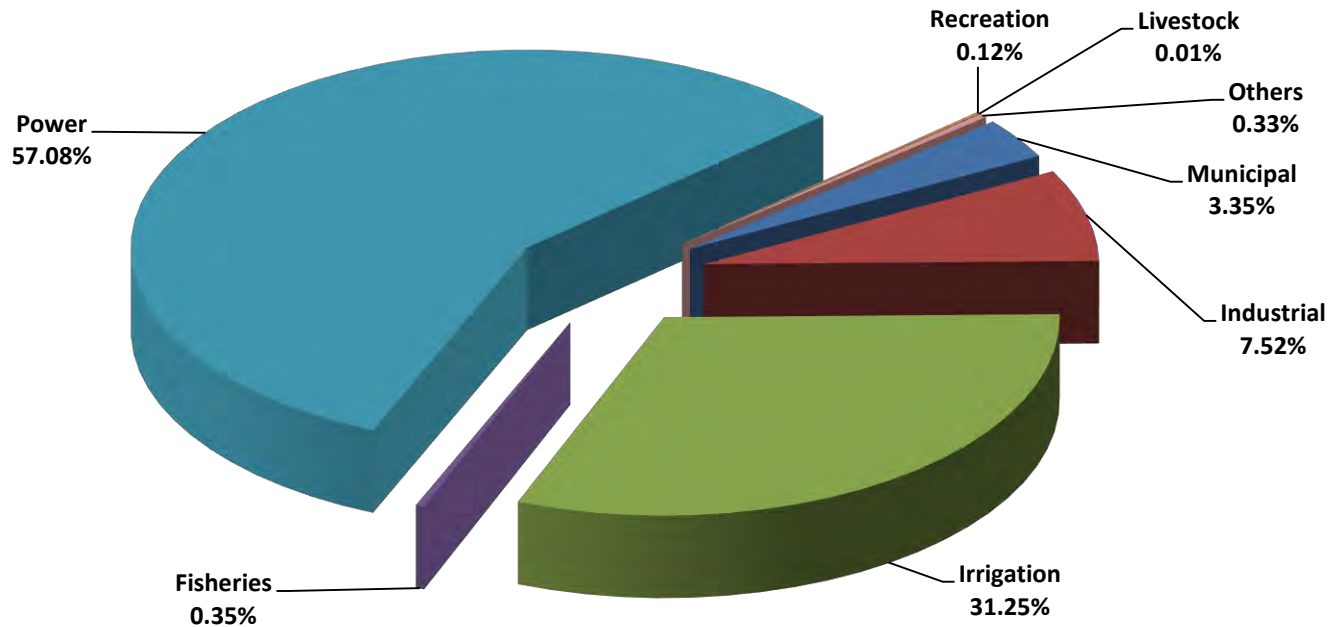
Water Resources Status

Consumptive Use



Water Resources Status

Non-Consumptive Use

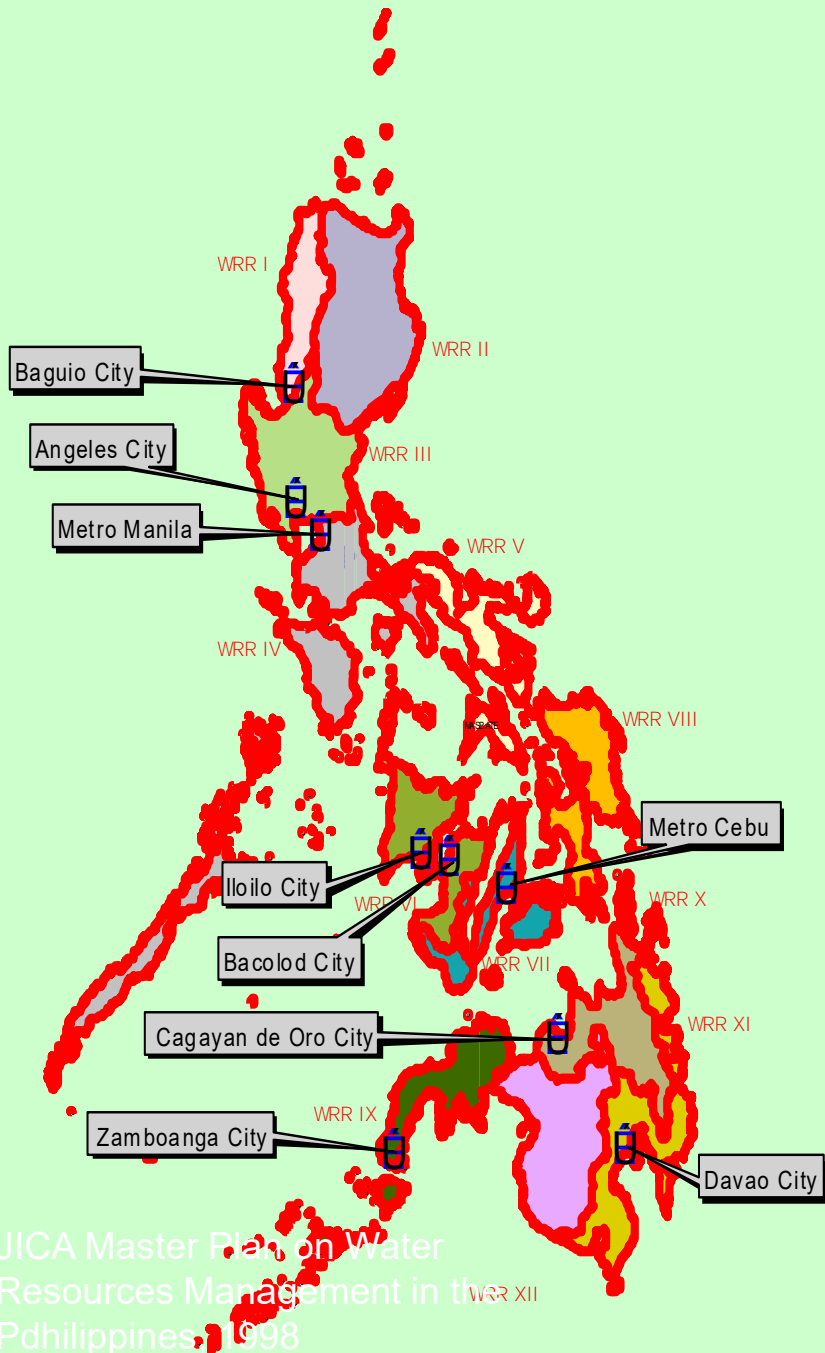


■ Municipal ■ Industrial ■ Irrigation ■ Fisheries ■ Power ■ Recreation ■ Livestock ■ Others

Water Resources Status

Water Resources Region	Groundwater	Surface Water (80% dependable flow)	Total Water Potential	Water Demand December 2018	Estimated Available Water
I	1248	3250	4498	4021.122	476.878
II	2825	8510	11335	9492.305	1842.695
III	1721	7890	9611	24117.785	-14506.785
IV	1410	6370	7780	16162.36	-8382.36
V	1085	3060	4145	3289.04	855.96
VI	1141	14200	15341	6274.32	9066.68
VII	879	2060	2939	3656.45	-717.45
VIII	2557	9350	11907	2876.2	9030.8
IX	1082	12100	13182	1515.27	11666.73
X	2116	29000	31116	6740.972	24375.028
XI	2375	11300	13675	5953.967	7721.033
XII	1758	18700	20458	7332.06	13125.94
Total	20197	125790	145987	91431.851	54555.149

Groundwater in Nine (9) Cities are stressed

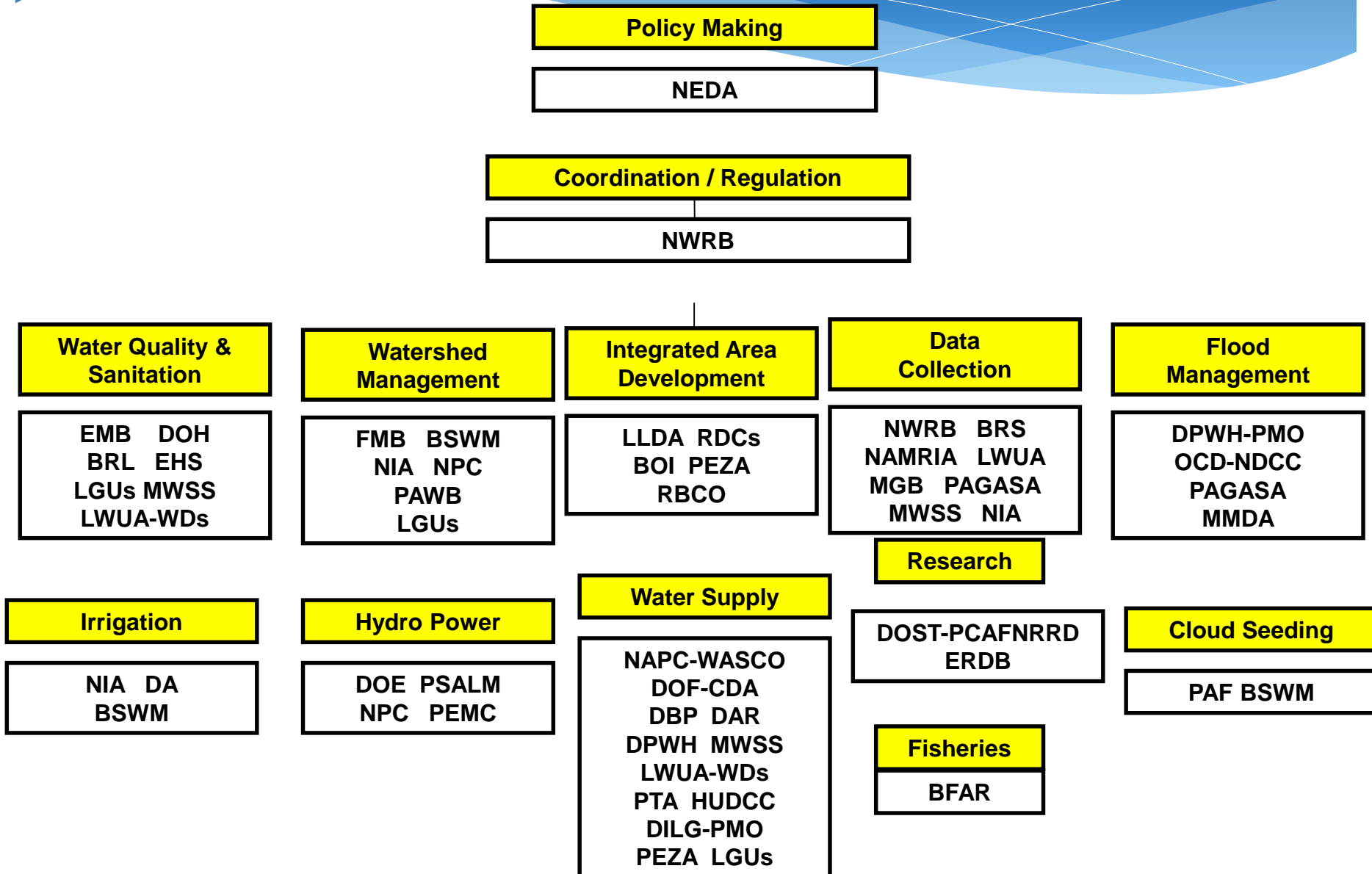


JICA Master Plan on Water Resources Management in the Philippines, 1998

- **Metro Cebu**
- **Bacolod City**
- **Iloilo City**
- **Davao City**
- **Cagayan de Oro City**
- **Zamboanga City**
- **Metro Manila**
- **Baguio City**
- **Angeles City**

Water Resources Management: Issues and Challenges

Institutional Structure in the Water Sector





Water Quality and Quantity

- ❖ *Unabated extraction of groundwater due to rapid urbanization and industrialization*
- ❖ *Inadequate Sewerage and Sanitation facilities*
- ❖ *Watershed degradation*
- ❖ *Deteriorating health of river and coastal systems*
- ❖ *Indiscriminate land use development*





Extreme Events:

Increasing incidence and intensity of water related risks such as Typhoons, Floods, Droughts and Landslides.





Water Resources Management: Issues and Challenges

💧 Increasing water demand together with insufficient water infrastructure threatens to outstrip sustainable levels of supply





Groundwater Contamination

Leaching of industrial, agrochemicals and animal wastes in agro-industrial areas



Sub-surface discharges from latrines and septic systems and infiltration of polluted urban run-off



Water Resources Management: Challenges

Surface Water Pollution



Direct dumping of domestic solid waste in rivers and lakes created adverse impact on water quality and availability



Wastewater discharges from domestic and industries to bodies of water contaminate water bodies



Threats of Climate Change

- Increased intensity and frequency of storm (La Niña) and drought (El Niño)
- Variation in streamflow and groundwater recharge affecting water quality and seasonal water availability
- Higher temperatures affecting water quality (such as eutrophication)
- Sea Level rise causing saltwater intrusion into surface and ground water, affecting the amount and quality of water supplies



Seven extreme tropical cyclone/southwest monsoon induced extreme events occurred in 1991 to late 2004



The worst drought occurred in 1997-1998 El Niño, resulted in severe water shortage in M.Mla



- ❖ **Numerous and Conflicting laws and policies at the national and local levels**
- ❖ **Absence of updated and reliable data/information to fully conduct a water resources assessment (supply and demand analysis, water balance, etc.)**



Water Resources Management: Issues and Challenges

Regulation of the Angat Reservoir (Angat Water Allocation)



Water supply to Metro Manila, with 15 million population



Flood control to Bulacan Province



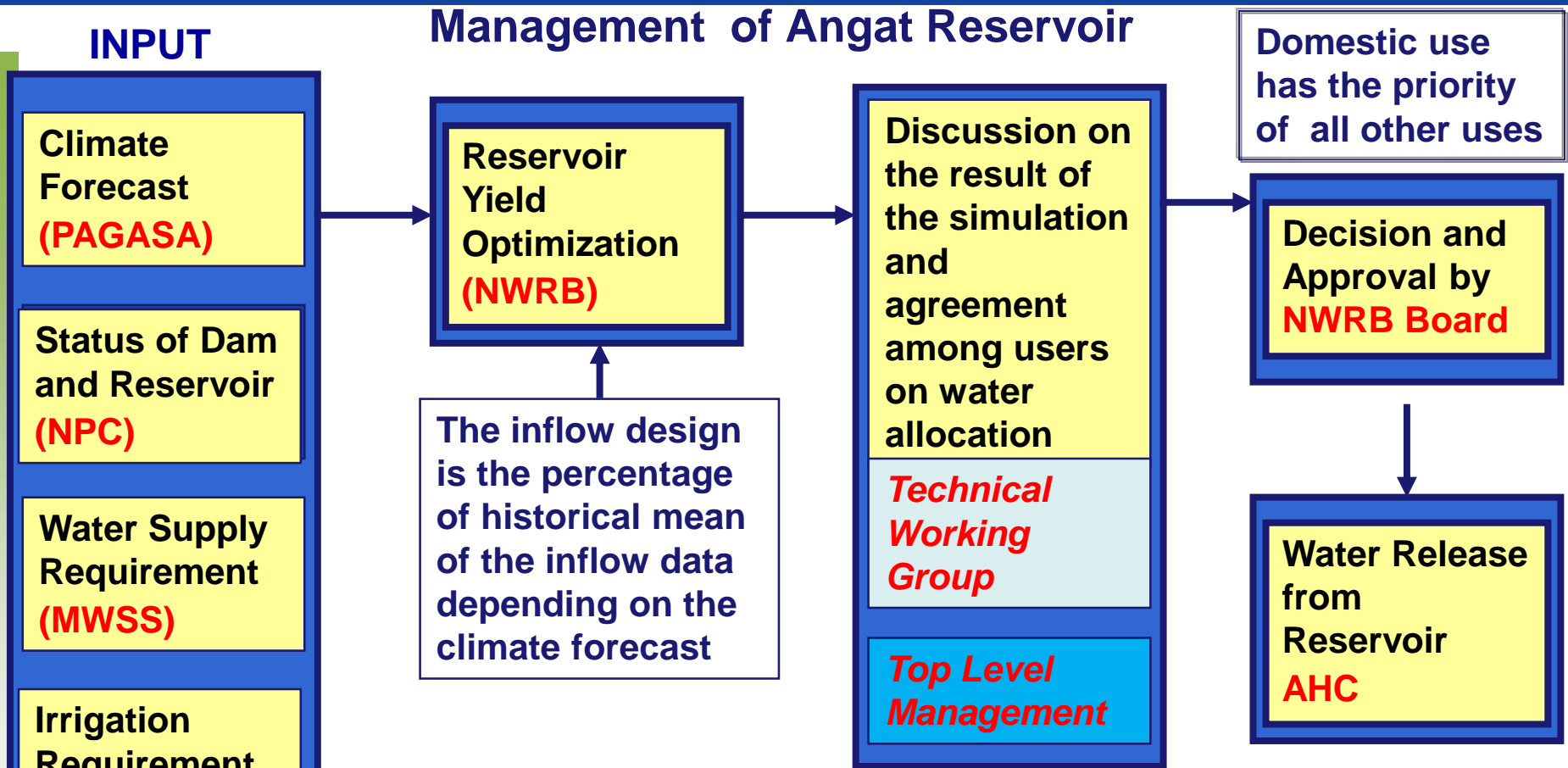
Irrigation to 27,000 has. of farm lands in Bulacan and Pampanga Provinces



Power generation for Luzon Power Grid



Water Resources Management: Issues and Challenges



PAGASA - Philippine Atmospheric, Geophysical and Astronomical Services Administration (meteorological agency)

NPC - National Power Corporation (owner of dam)

AHC - Angat Hydropower Corporation (operator and user)

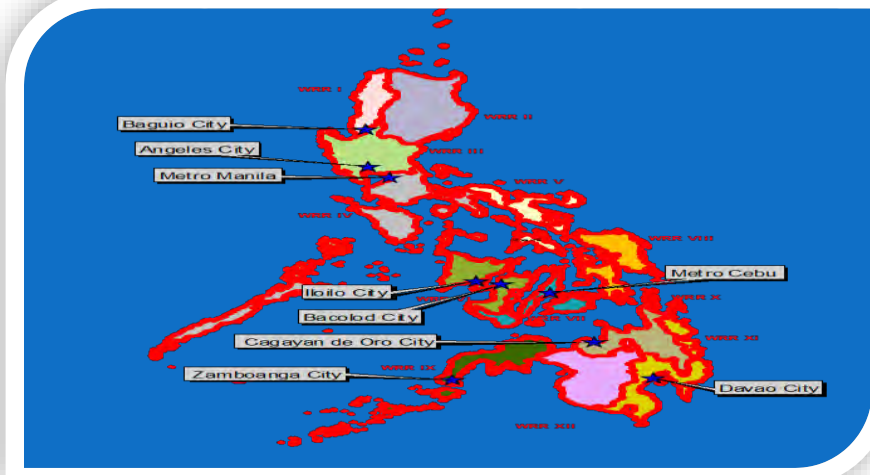
MWSS - Metropolitan Waterworks and Sewerage System (user)

NIA - National Irrigation System (user)

NWRB - National Water Resources Board (regulator)

Water Resources Management: Initiatives and Opportunities

- * Develop Groundwater Management Plan for the nine water stressed areas and other key cities
- * Conduct of Comprehensive Water Resources Assessment in all Major River Basins
- * Construction of Groundwater Monitoring Wells in the nine water stressed



Water Resources Management : Initiatives and Opportunities

Integrated 3D GIS-Based Water Resources Management Information System in the Provinces of Pampanga and Bulacan (KOICA funded projects)

202.90.134.59 | http://www.wrrm.gov.ph

Search

Integrated GIS Water Resources Management Information

About Us | Water Resources | Hydrological Data | Water Permit | River Flow | DataBank

REAL-TIME HYDROLOGICAL INFORMATION
Date & Time updated: June 03, 2016 10:10

Location	Value 1	Value 2
Zaragosa	0.38	0
Alipando	14.80	11.00
Arayat	8.00	5.00
Mivado	8.90	9.00
Mivado	0.00	0.00
Sulaman	1.45	0
Sulpan	0.00	0.00
Bustos	0.59	0
Bustos	8.00	9.00
Bustos	17.38	0.00
Ipo Dam	0.00	0.00

Water Level/Flow | Rainfall

Category	Value 1	Value 2
Draw Legend	Reservoir Level	Low Level
Station Legend	W.L.	Flow
Water Level/Flow	0.01	0
Water Level/Flow	0.00	0.00
Water Level/Flow	4.80	3.00
Water Level/Flow	0.00	0.00
Water Level/Flow	0.88	0
Water Level/Flow	8.00	3.00
Water Level/Flow	0.00	0.00
Water Level/Flow	1.80	0.00
Water Level/Flow	0.00	0.00

Issued at 10:10 06/03/2016 - AngatDam | No Data | [100%, 210m] | IpoDam | No Data | [0%, 0m] | Bustos

User ID:

Password:

ID Save

Register Now | ID/Pass Search

- Water Resources
- Water Permit
- River Flow
- Data Bank

NOTICE | **Q&A**

- Final report at Microsat (December 2, 2015) | 13-17
- System Demonstration at NWRB (October 27, 2015) | 15-17
- 2nd Training at K-water Academy (Aug. 31 - Sep. 11, 2015) | 15-19
- Capacity for completion of Server Room (Aug. 28, 2015) | 15-17
- Introduction of equipment for Data Center (Jun. 15, 2015) | 15-17

Water Resources Management : Initiatives and Opportunities

Foreign funded Project (Technical Assistance)

Aug 2010
to present

- **International Atomic Energy Agency (IAEA)- Water Availability Enhancement (IWAVE) Project ;** determining recharge and age of groundwater; piloted in Regions 2 and 10 and nine water stressed areas

Investment Needs for
Resource Assessment Capability in the Philippines
to Improve the
Planning and Management of Water
Infrastructure



Prepared as part of the
IAEA Water Availability Enhancement Project (IWAVE)



Water Resources Management: Initiatives and Opportunities

- ❖ **Presence of the Water Utilization Units (WRUs) -DENR to assist NWRB in terms of inventory of water users in different areas nationwide and other selected functions related to water permit inspection and monitoring and assisting water permit applicants**
- ❖ **Established regional offices in Metro Cebu and Metro Iloilo in 2018**
- ❖ **Partnership with DOST PCIEERD (R and D projects) to develop capabilities in increasing the resiliency of water resources through proper management and planning for appropriate infrastructure as well as growing challenges and uncertainties brought upon by climate change**

A photograph showing four hands of different skin tones (two darker, two lighter) holding a continuous, circular stream of water. The water is captured in mid-air, creating a ring shape. The background is plain white. The text 'Water Resources Management is a Shared Responsibility' is overlaid in the center of the water ring.

Water Resources
Management
is a Shared
Responsibility

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