WATER QUALITY MANAGEMENT IN THE CONTEXT OF BASIN MANAGEMENT: WATER QUALITY, RIVER BASIN MANAGEMENT AND GOVERNANCE DYNAMICS IN THE PHILIPPINES

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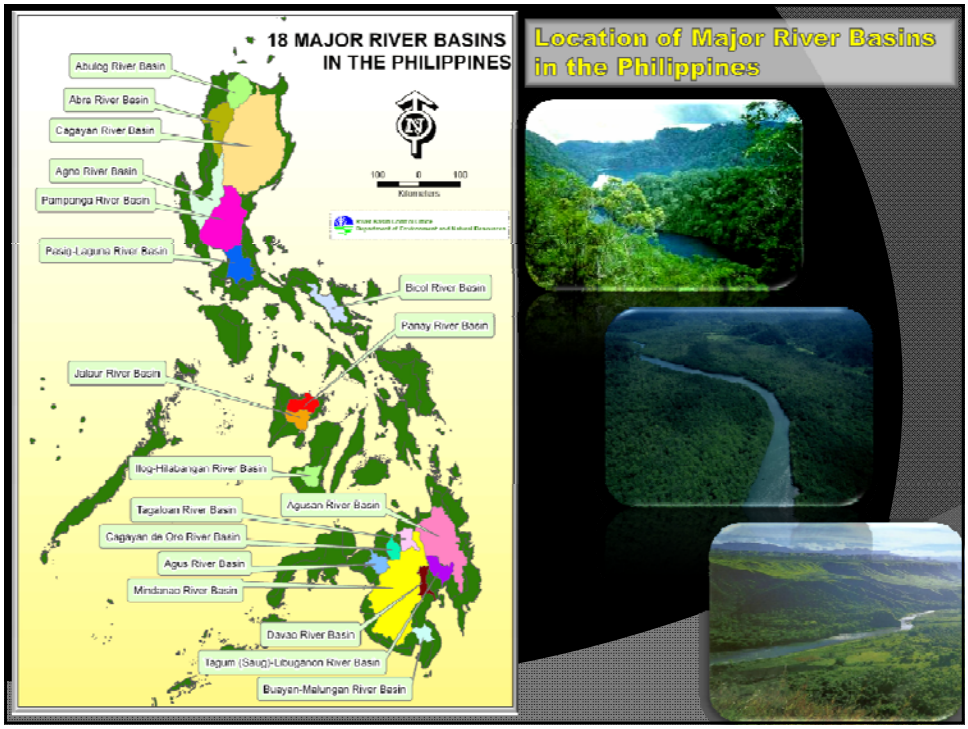
Fresh Water Resources of the Country

- 421 Principal rivers (421 river basins)
- 18 major river basins (with drainage area greater than1,000 sq.km.)
- 72 lakes
- Extensive groundwater aquifers



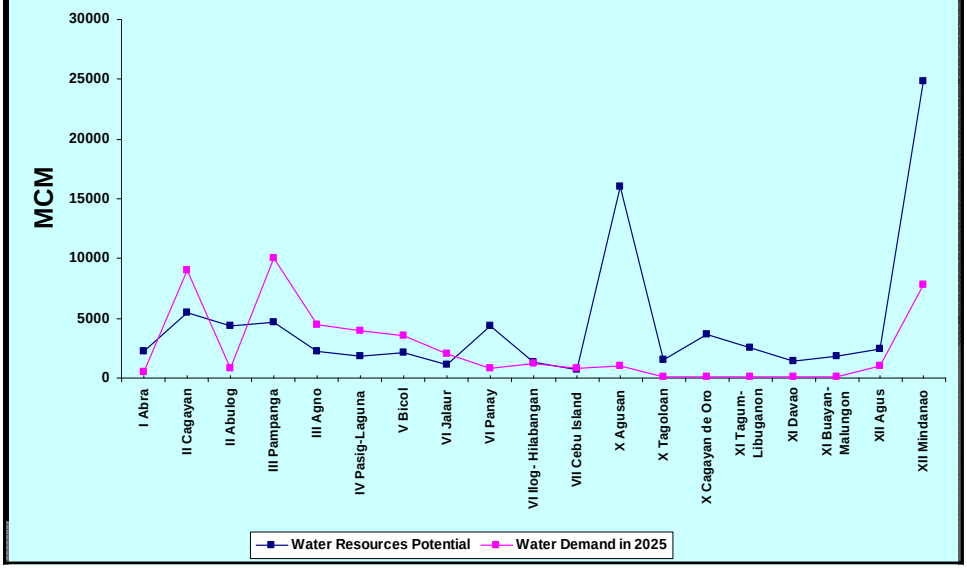


Drainage Area of 18 Major River Basins in the Philippines

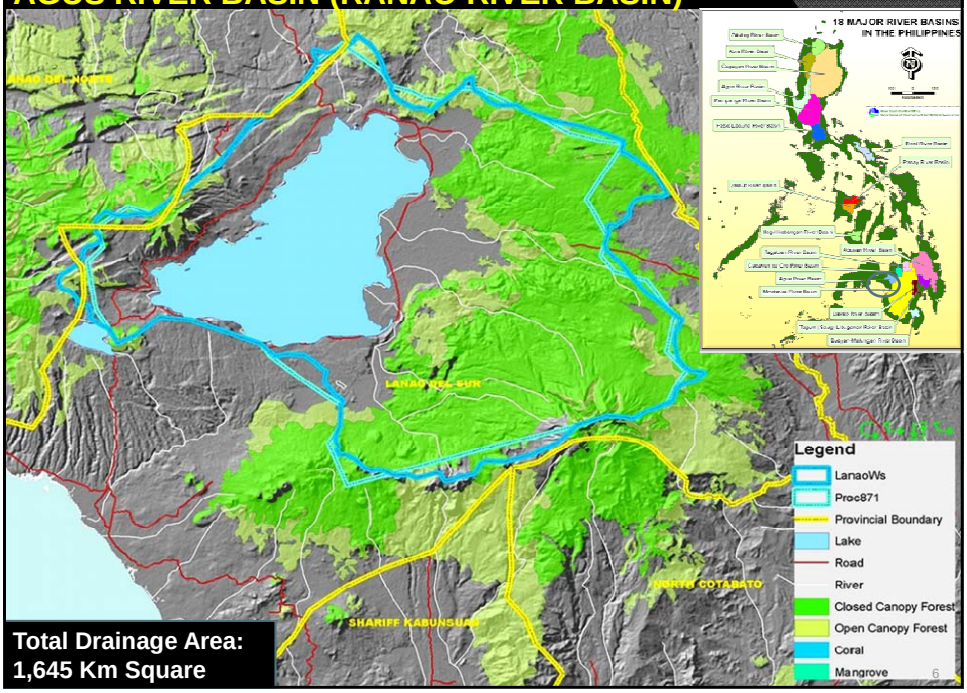
Number	Name of River Basin	Drainage (sq. km.)
1	Cagayan	27,753
2	Mindanao	23,169
3	Agusan	11,937
4	Pampanga	10,434
5	Agno	5,952
6	Abra	5,125
7	Pasig-Laguna	4,678
8	Bicol	3,771
9	Abulug	3,372
10	Tagum Libuganon	3,064
11	Ilog-Hilabangan	1,945
12	Panay	1,843
13	Tagoloan	1,704
14	Agus	1,645
15	Davao	1,623
16	Cagayan de Oro	1,521
17	Jalaur	1,503
18	Buayan-Malungan	1,434
TOTAL		112,473

37.50 % of the total land area of the Philippines

Water Potential and Water Demand in 2025 in Major River Basins



AGUS RIVER BASIN (RANAO RIVER BASIN)



Total Drainage Area:
1,645 Km Square

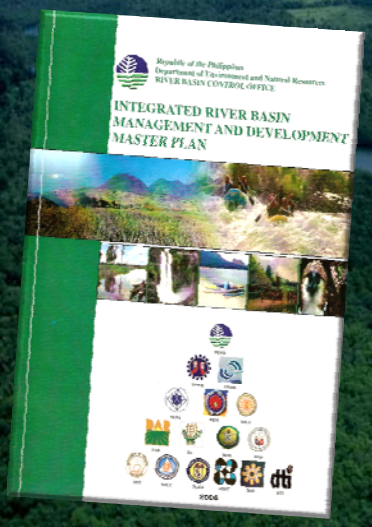
Water Management Typology

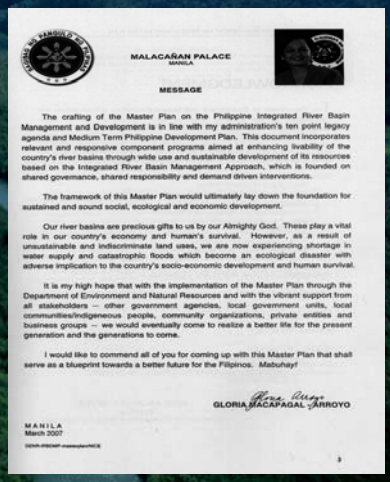
Type	Area Extent	Administrative Coverage	Institutional Coordinating Agency	Type and Scope of River Basin/Watershed Management Plans
	Nation	Whole Country	National inter-agency basin resources management forum/ national river basin management body	Coordination and prioritization of the different levels of basin management within a national strategy framework
River Basin	Over 1000km^2	Typically the topographic boundaries would include land occurring within 3 or more provinces and 2 or more regions	River Basin Organization (RBO)/Authority that is inter-regional in extent	Plan aimed at broad sector development planning, and land use zoning. Identification of degraded and/or economically important medium to large watersheds within the river basin. Identification of medium-large areas in need of protected area status.
Large Watershed	500-1000 km^2	Typically the topographic boundaries would include land occurring within 3 or more provinces and at least one but no more than 2 regions	Regional level watershed management council that is inter-provincial in extent	Plans aimed at identifying broad land use zones and areas (small to medium watersheds) where there is a need for improved watershed management. Identification of small-medium areas in need of protected area status.

Water Management Typology

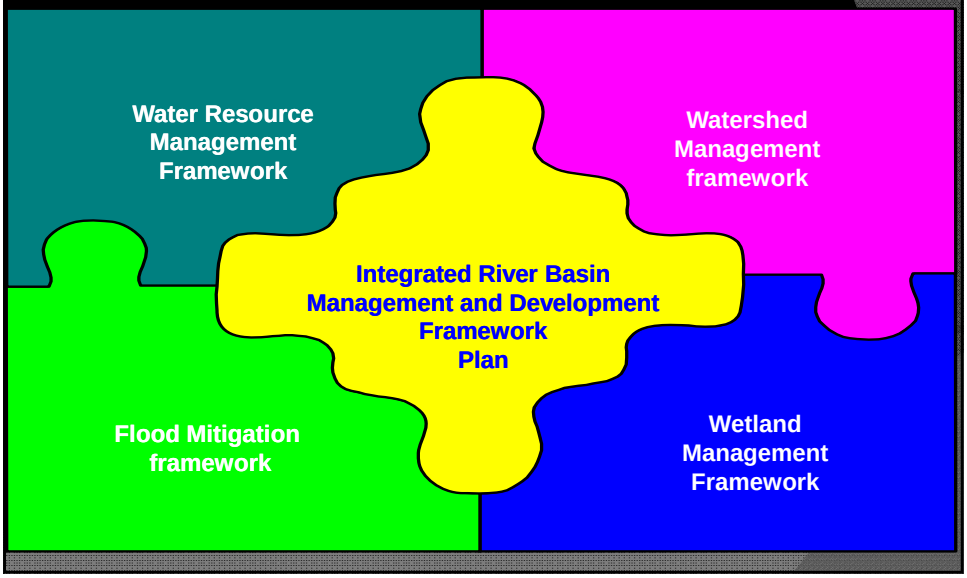
Type	Area Extent	Administrative Coverage	Institutional Coordinating Agency	Type and Scope of Basin Management Plans
Medium Watershed	100-500 km^2	Typically the topographic boundaries would include land occurring within at least one but no more than two provinces	Provincial level watershed ma	Plans aimed at identifying areas within the watershed where ther is a need for field level activities Implementation plan targets activities only on the critical part of the watershed.
Small Watershed	10-100 km^2	Typically the topographic boundaries would fall within one province and include land occurring within one or more municipalities	Provincial/ municipal level watershed management council/ committee	Plans aimed at field level implementation of improved watershed/ land management interventions. Plan covers the whole (or most of the) watershe and adjacent land of the participating communities.
Micro Watershed	Under 10 km^2	Typically the topographic boundaries would fall within one municipality and include land occurring within one or at most two	Municipal/ Barangay community level watershed management council	Plans aimed at field level implementation of improved watershed/ land management intervention. Plan covers the whole watershed and adjacent land of the participating community

The Philippines River Basin Framework Plan





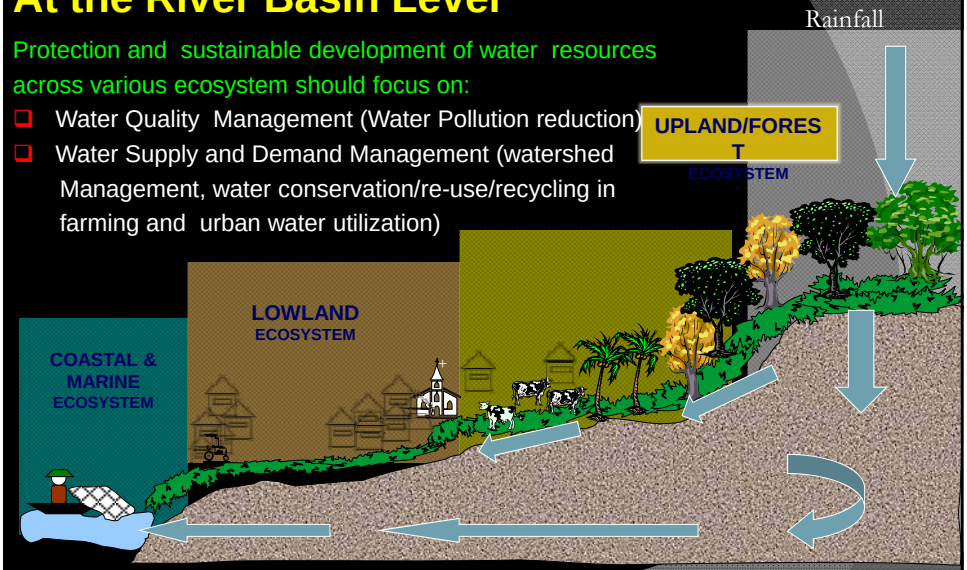
Integrated River Basin Management and Development Framework Plan



At the River Basin Level

Protection and sustainable development of water resources across various ecosystem should focus on:

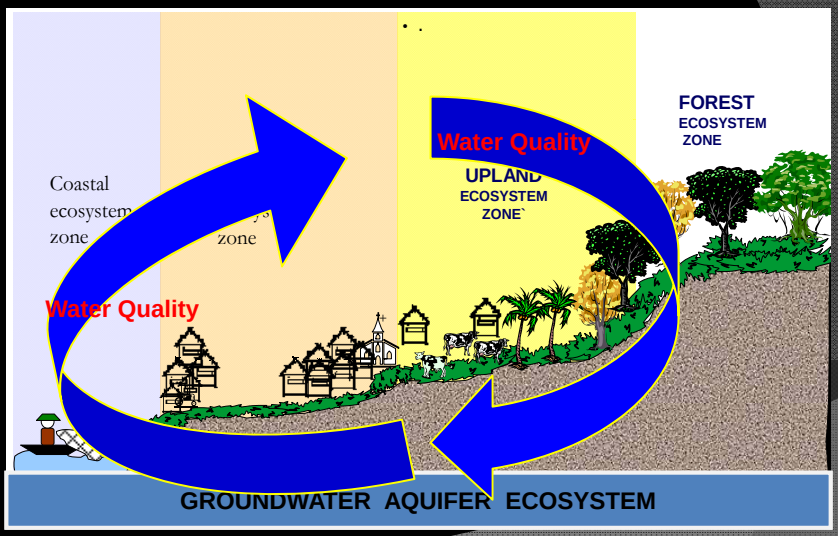
- Water Quality Management (Water Pollution reduction)
- Water Supply and Demand Management (watershed Management, water conservation/re-use/recycling in farming and urban water utilization)



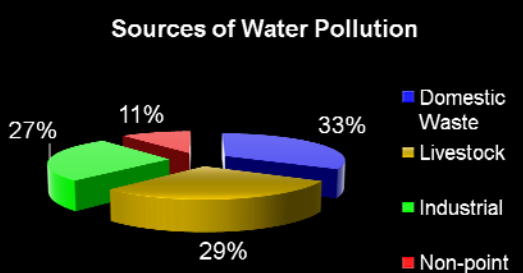
River Basin as a Planning unit

Water conservation considers hydrologic cycle and climate change issue

Linkages between Water Quality and River Basin

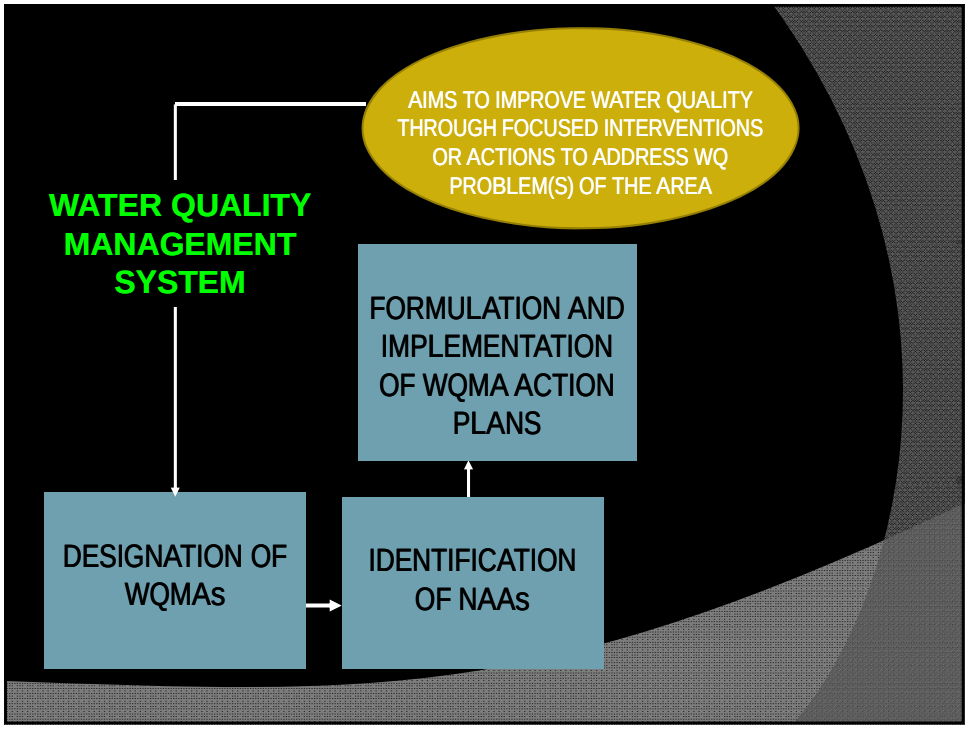


State of Water Quality in the Philippines



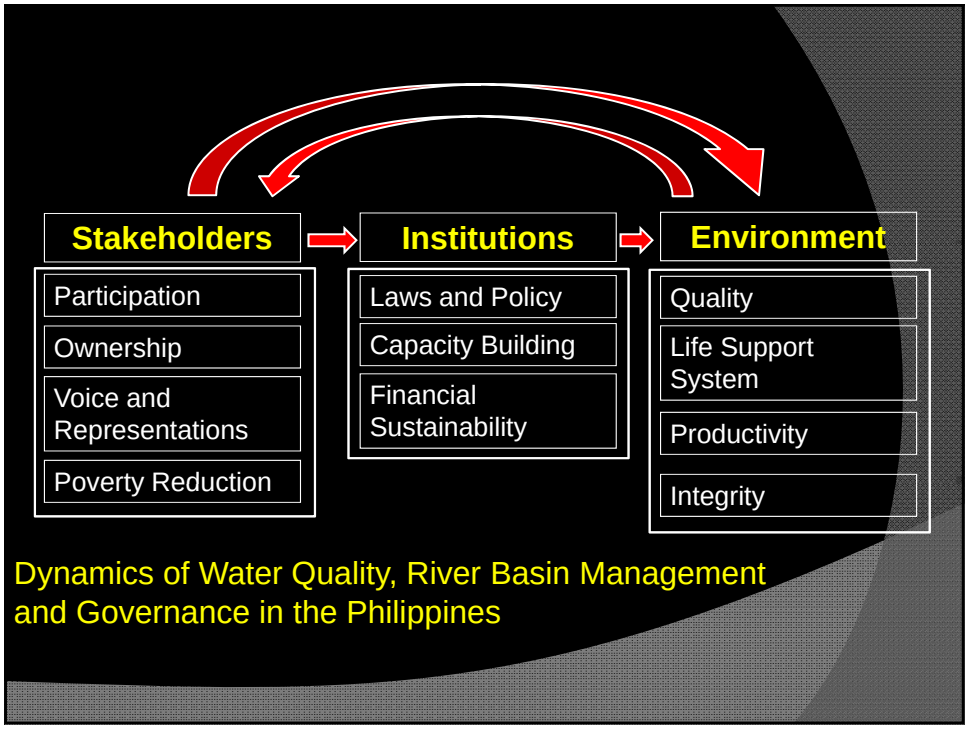
The Philippine Clean Water Act 2004
(Republic Act No, 9275)

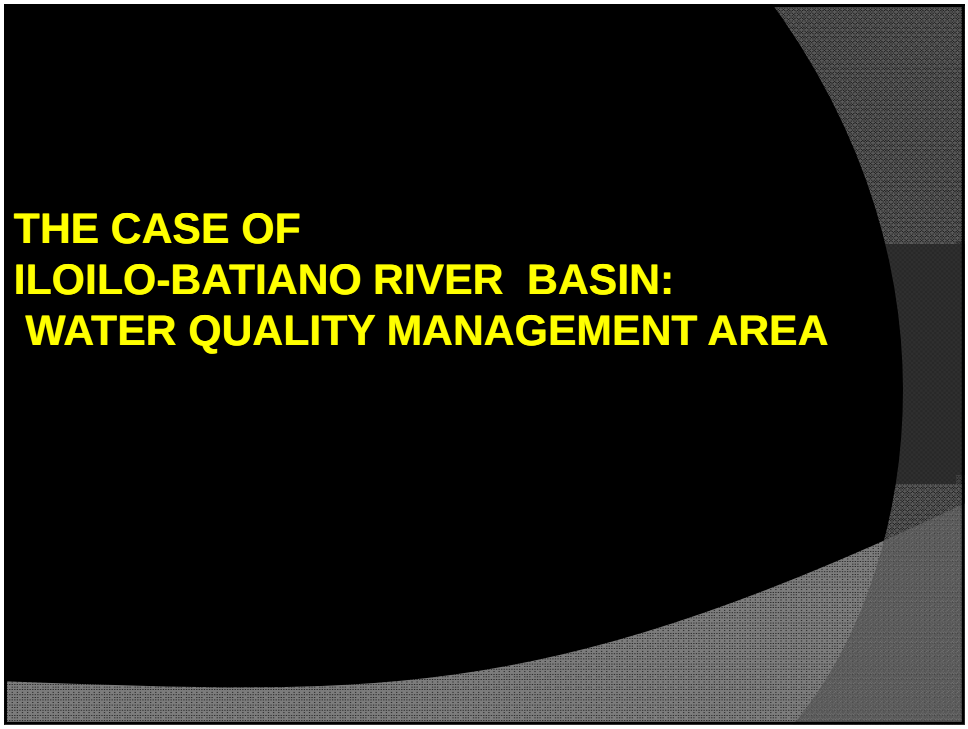
- designate certain areas as water quality management area appropriate physiographic units such as watershed, river basins or water resources regions
- similar hydrological, meteorological or geographic conditions which affect the physiochemical, biological and bacteriological reactions and diffusions of pollutants in water bodies or otherwise share common interest or face similar development programs, prospects, or problems



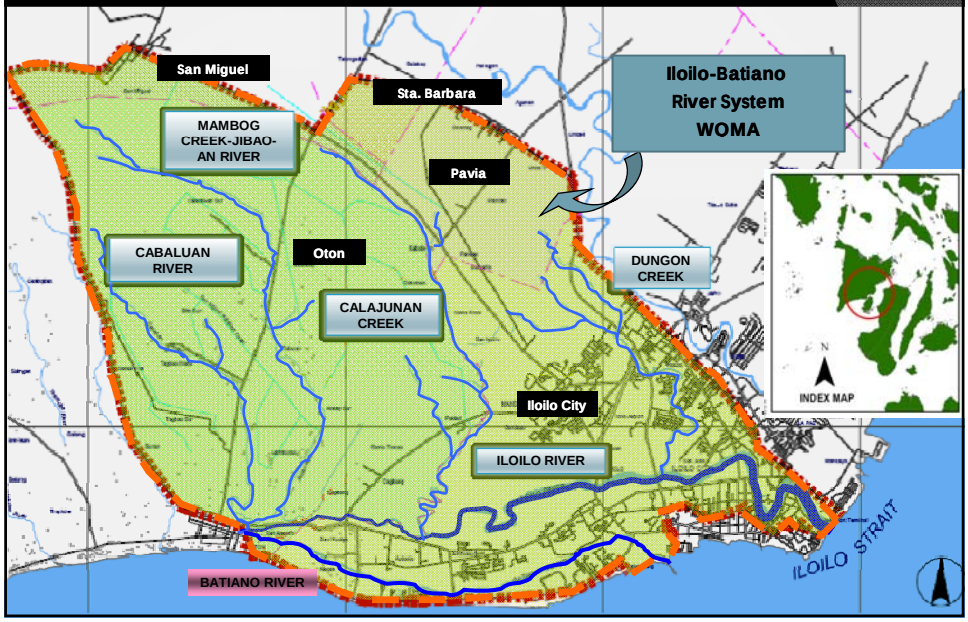
Why Water Quality Management in the context of Basin Management is better approach?

- Manageable Planning Area
- Focused intervention or actions designed to address specific water quality issues in each basin area
- Management area with similar hydrological, hydroecological, meteorological, and geographical characteristics
- Ease of monitoring the state of water quality


Stakeholders
Institutions
Environment
Participation
Ownership
Voice and Representations
Poverty Reduction
Laws and Policy
Capacity Building
Financial Sustainability
Quality
Life Support System
Productivity
Integrity
Dynamics of Water Quality, River Basin Management and Governance in the Philippines


THE CASE OF
ILOILO-BATIANO RIVER BASIN:
WATER QUALITY MANAGEMENT AREA

ILOILO-BATIANO RIVER BASIN

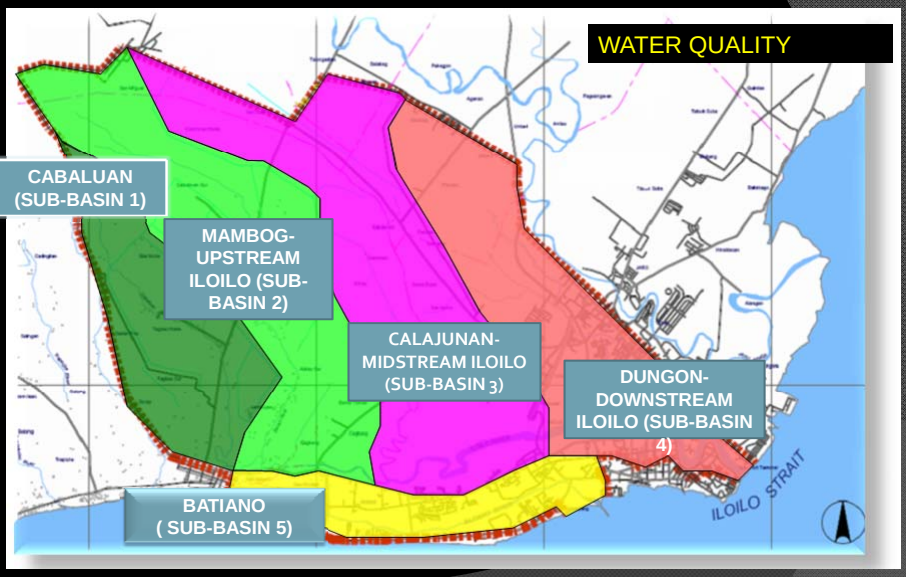


River Streamflow dynamics during high tide

Backflow of water

River Streamflow dynamics during low tide

Delineation of WQMA and Sub-Basins Area



Establishment of Water Quality Monitoring Stations

Monitoring Stations

- 6 Stations Along Iloilo River (all in Iloilo City)
- 4 Stations Along Batiano River
- 3 Stations Along Calajunan Creek
- 2 Stations Along Dungon Creek
- 1 Station in Mambog Creek

WATER QUALITY MONITORING STATIONS

Identification, Collection and Analysis of Water Quality Parameters

Parameters Analyzed

Biochemical Oxygen Demand, pH, Total Dissolved Solid, Total Suspend Solid, Dissolved Oxygen, Color and Temperature

Summary

Any effort to effectively and efficiently manage water quality of any water bodies can be achieved through river basin as a planning unit.

The stakeholders and institution play major role in achieving effective water quality management using basin approach.

Challenges and Recommendation

- Integration of water quality strategies and action plans at the river basin level integrated framework/master plan
- Establishment and operationalization of River Basin Integrated Information Management System (RBIIMS) incorporating water quality parameters
- Intensify law enforcement to apprehend violators of Clean Water Act
- Strengthen participation and partnership in water quality and river basin management
- Creation and mobilization of River Basin Organization (RBO) in all river basin

THANK YOU!!!