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# Water Supply for Metro Manila

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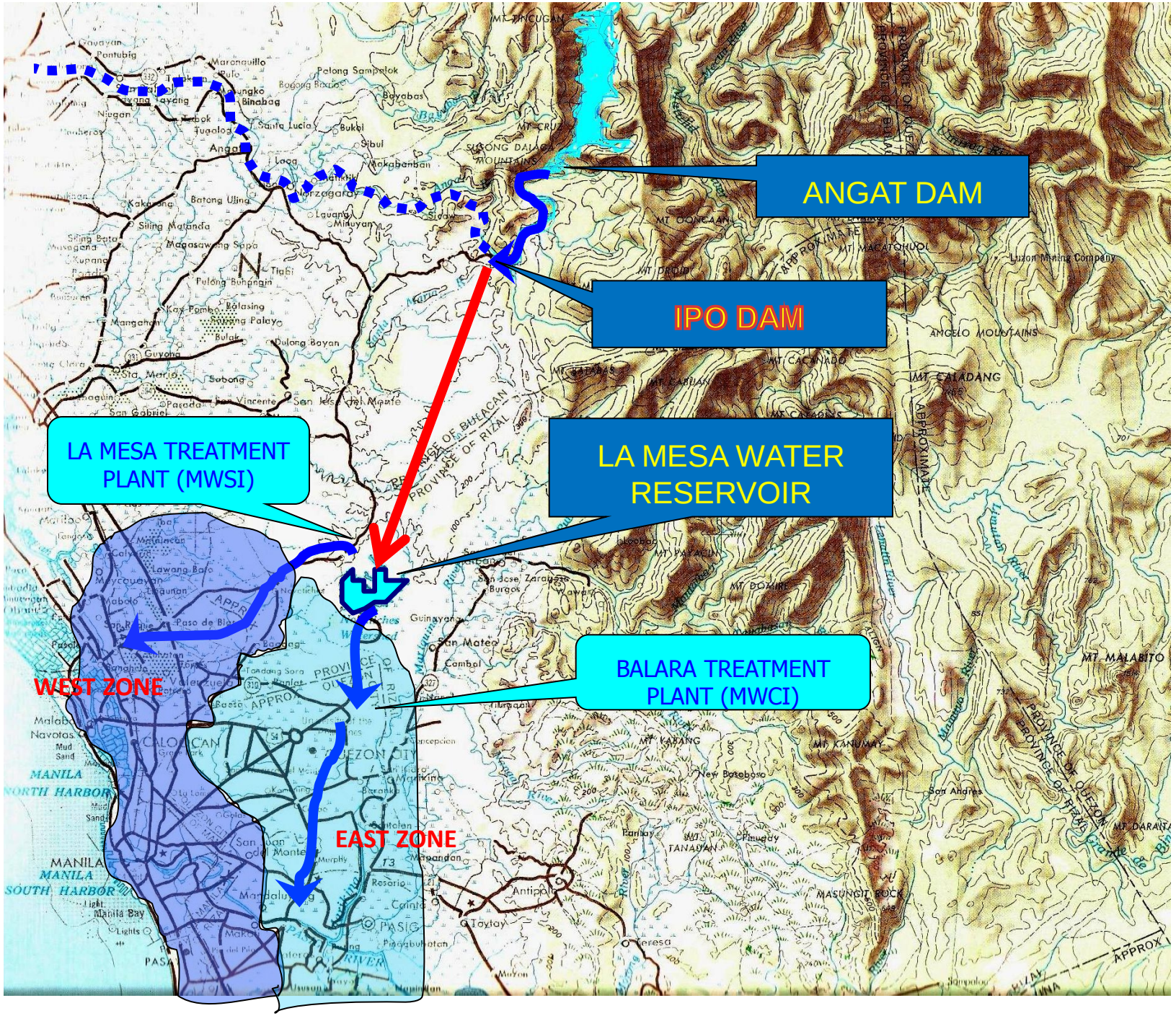
2013.09.06


ANGAT DAM
IPO DAM
LA MESA TREATMENT PLANT (MWSI)
LA MESA WATER RESERVOIR
BALARA TREATMENT PLANT (MWCI)
WEST ZONE
EAST ZONE

Diverts water from Angat River through tunnels to Bicti and aqueducts to La Mesa

Provides 97% of Metro Manila's water supply

UMIRAY DIVERSION DAM (MWSS)

UMIRAY – ANGAT TUNNEL

ANGAT RESERVOIR (NPC)

IPO DAM (MWSS)

ALAT DAM (MWCI)

NOVALICHES DIVERSION WEIR

LA MESA RESERVOIR

60% Maynilad

2400 MLD

LMTP 2

LMTP 1

BTP2

BTP 1

40% MWCI

1600 MLD

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- 97% of Metro Manila's water supply comes from Angat.
- Metro Manila water demand has grown since privatization of MWSS operations in 1997.
- Most of the 'new water' supply in the last 16 years actually came from Non-Revenue Water (NRW) reduction.
- Water crisis within the next 5 to 10 years if no new water sources will be developed.

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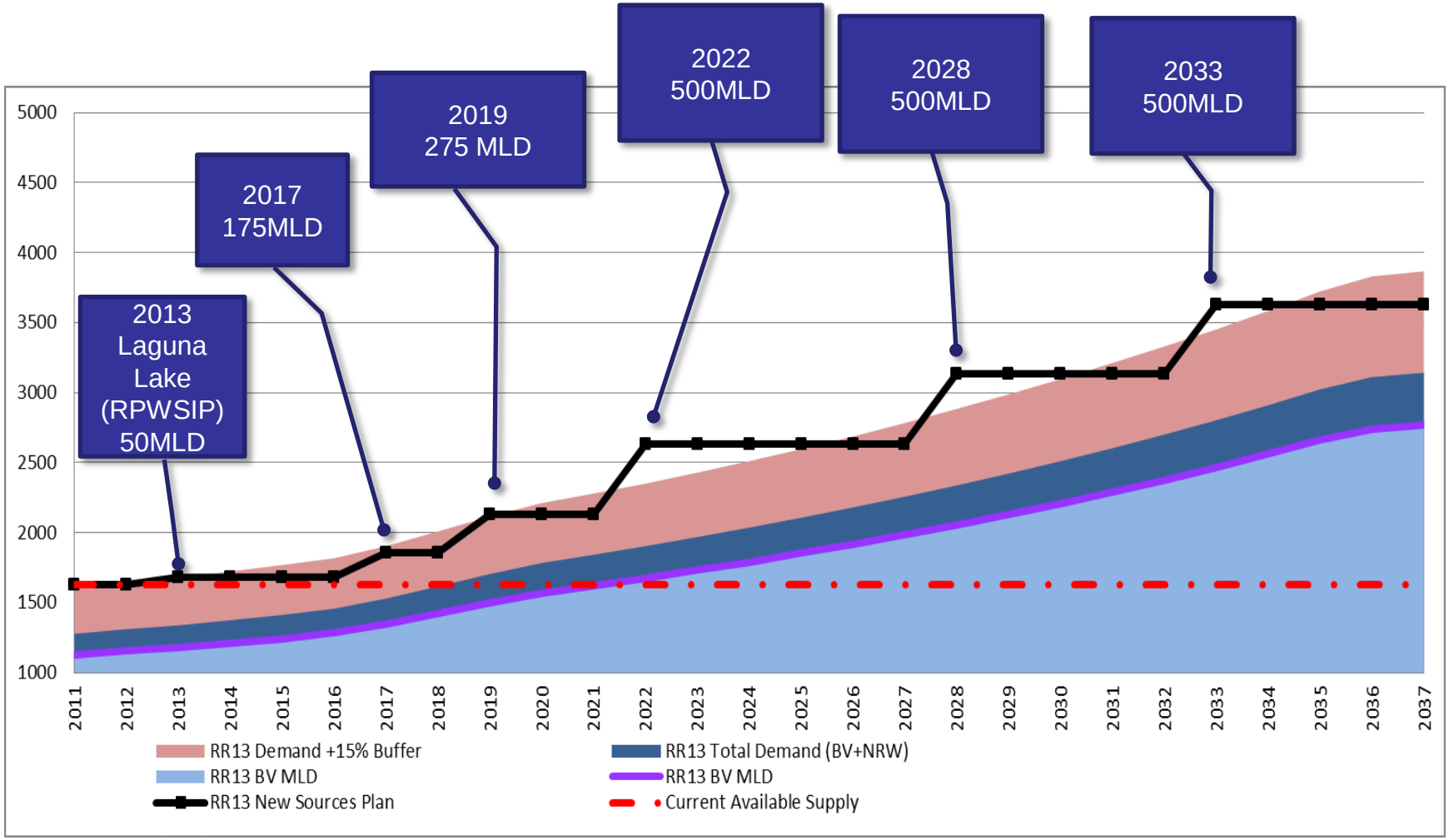
# Keeping up with the growing demand



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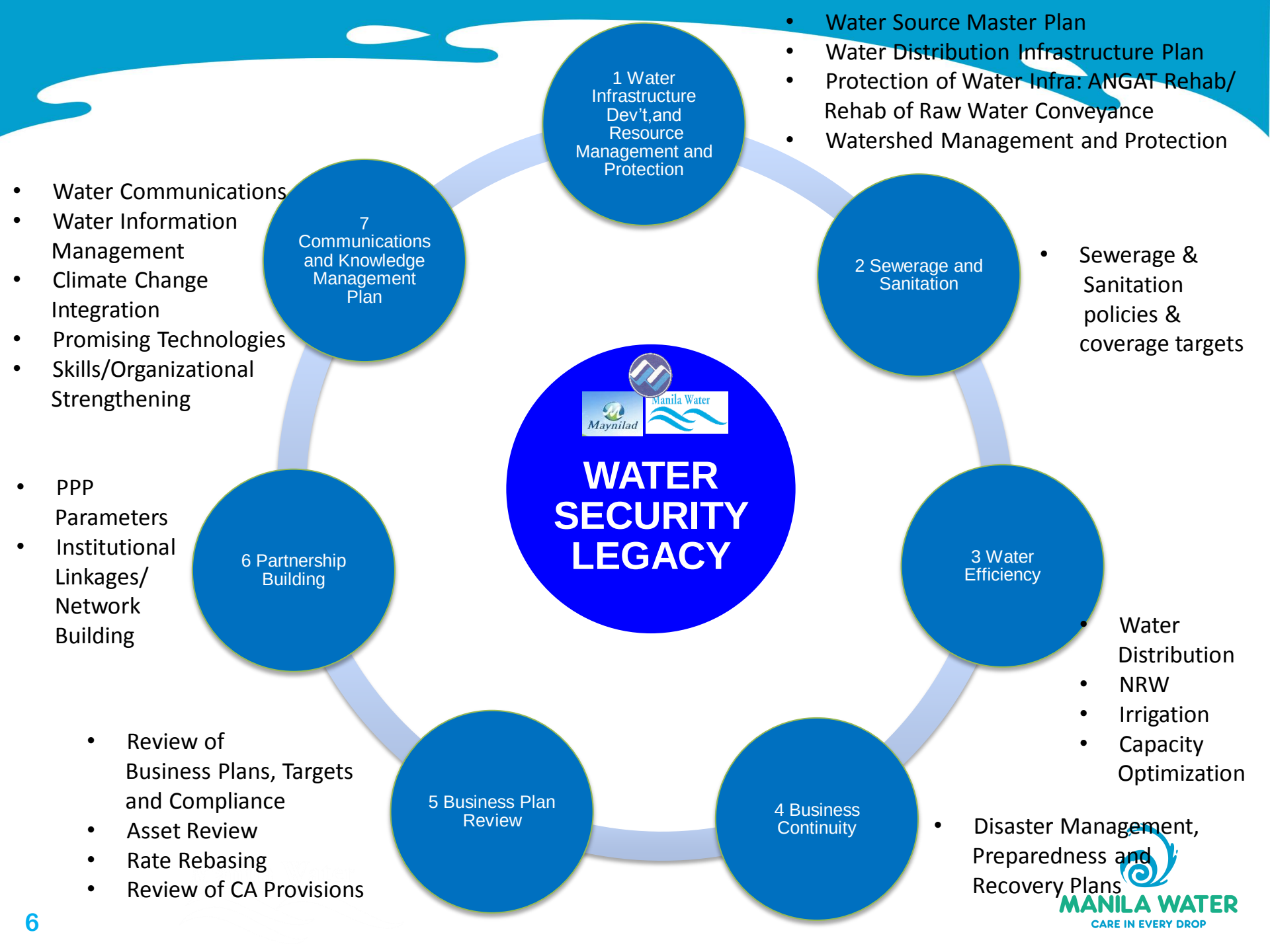


- Water Source Master Plan
- Water Distribution Infrastructure Plan
- Protection of Water Infra: ANGAT Rehab/ Rehab of Raw Water Conveyance
- Watershed Management and Protection

- Sewerage & Sanitation policies & coverage targets

- Water Distribution
- NRW
- Irrigation
- Capacity Optimization

- Disaster Management, Preparedness and Recovery Plans

- Review of Business Plans, Targets and Compliance
- Asset Review
- Rate Rebasing
- Review of CA Provisions

- PPP Parameters
- Institutional Linkages/ Network Building

- Water Communications
- Water Information Management
- Climate Change Integration
- Promising Technologies
- Skills/Organizational Strengthening

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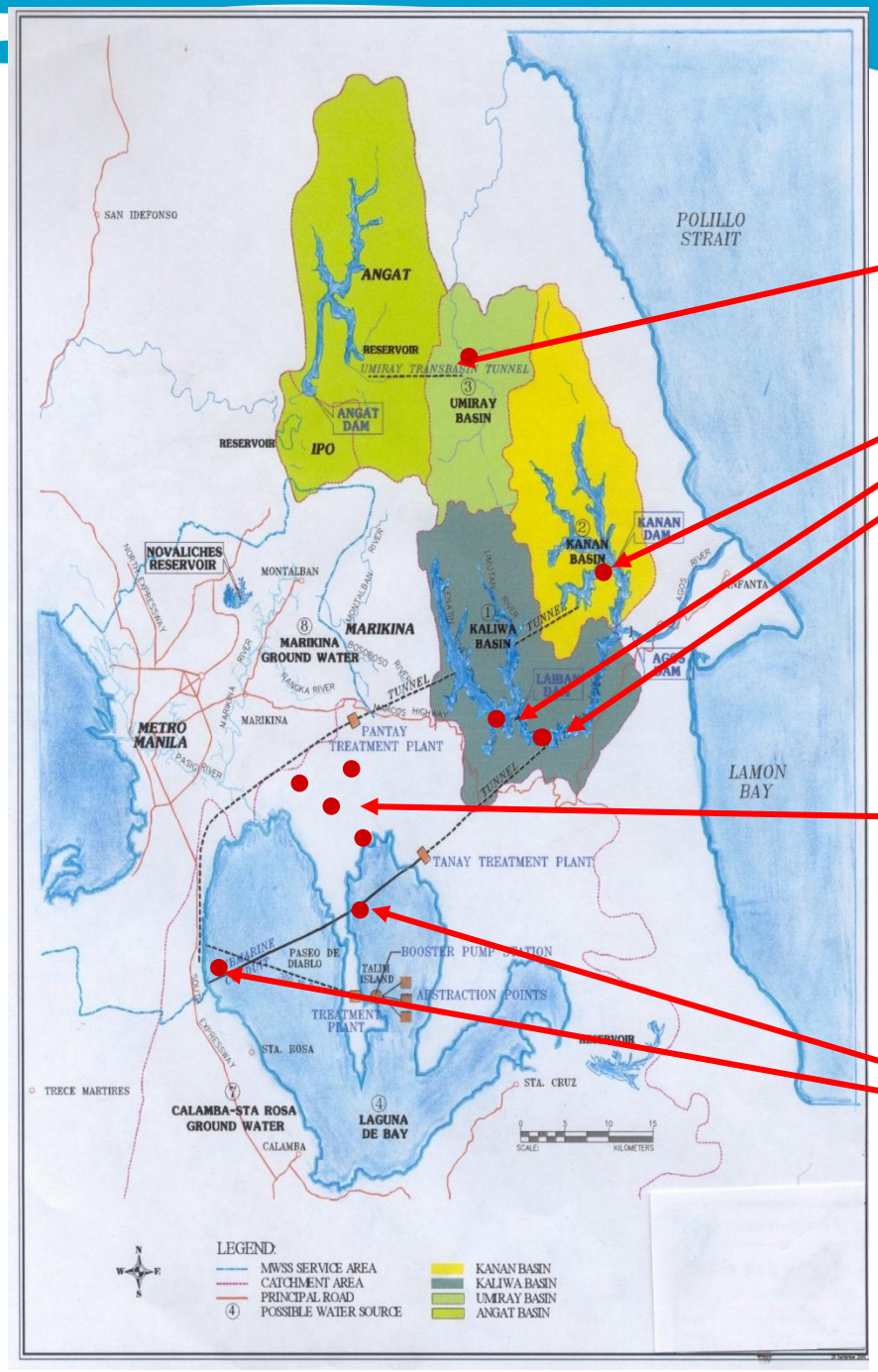
# MWSS - New Water Sources




WATER DIVERSION

NEW DAMS

GROUNDWATER?

LAGUNA LAKE PROJECTS

**Interim New Water Sources**

**Long-Term New Water Sources**

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# Water Tariff model
## Full cost recovery

$$\text{Water Tariff} = f(CAPEX\ recovery, OPEX\ recovery)$$

- CAPEX and OPEX related to the service of abstraction from source, conveyance, water treatment and distribution
- Does not incorporate value of ecosystem services (provisioning & regulating) that provided the raw water in the first place

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# Water Tariff model
## with raw water price

$$\text{Water Tariff} = f(CAPEX\ recovery, OPEX\ recovery) + \boldsymbol{raw\ water\ price}$$



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# Recall the Dublin Principles…

- Fresh water is a finite and vulnerable resource, essential to sustain life, development and the environment.
- Water development and management should be based on a participatory approach, involving users, planners and policy-makers at all levels.
- Women play a central part in the provision, management and safeguarding of water.
- Water has an economic value in all its competing uses and should be recognized as an economic good.

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# Fundamental issues on raw water pricing

- Water is a human right. Shouldn't it be free?
- How is the intrinsic value of the water determined?
- Is raw water price applicable only to water extracted? What about uses of water *in situ*?
- How is water quality considered in the valuation?
- Is raw water price based on how much it costs to manage the water source/ecosystem effectively? How about valuating other ecosystem services?
- Who should be charged? To whom should it be paid?

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# LLDA valuation approach

$$RC = \frac{MC + AE}{WC} \times multiplier$$

- RC = raw water charge
- MC = management cost; a percentage of LLDA annual budget
- AE = annual expenditures; total annual costs in implementing LLDA's work plan
- WC = water consumption
- Multiplier based on the nature of the water use (e.g. domestic, industrial…)

# LLDA valuation approach

$$RC = \frac{MC + AE}{WC} \times multiplier$$

- What is the basis for choosing 10% as a multiplier for MC?
- Is all the AE directly related to the work plan for managing the quantity and quality of the lakewater itself? Is this amount actually being spent annually?
- What is the basis for the WC? Does this pertain to all the water that is in the lake and passes through the lake in one year, or just the total water extracted in one year? Is this applicable to all lakewater users, present and future?
- What is the legal or scientific basis for the multiplier?

# Moving Forward

- Agree on the fundamental issues first before working on the numbers
- Adopt a science-based methodology
- Involve all water users / beneficiaries
- Develop key performance indicators for whoever collects the fees



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