HOLISTIC MANAGEMENT OF WATER RESOURCES IN MALAYSIA

14 – 16 DECEMBER 2015

BORNEO WATER & WASTEWATER EXHIBITION & CONFERENCE

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DEFINITION OF WATER IN CONTEXT OF NATIONAL WATER RESOURCES

SURFACE WATER
- Contained in Water Bodies (Natural or Artificial) e.g.
  - Rivers
  - Ponds
  - Estuaries
  - Canals
  - Lakes
  - Wetlands
  - Water Cathment

GROUND WATER

SEA WATER
- 3 Nautical Mile Width from Coastline

ATMOSPHERIC WATER
ANNUAL RAINFALL
3,000 mm / 990 Bm³

SURFACE RUNOFF
1,715 mm / 566 Bm³

ESTIMATED POTENTIAL GROUNDWATER STORAGE
15,152 mm / 5,000 Bm³

EVAPORATION
1,091 mm / 990 Bm³
WATER AVAILABILITY

Surface Runoff
- Peninsular: 147 Bm³
- Sarawak: 306 Bm³
- Sabah: 113 Bm³

Total Raw Water Supply: 566 Bm³

Water Demand
- 15.5 Bm³ (2.7%) to 20 Bm³ in 2020

Enough water to meet domestic, industrial, agricultural, energy production and environment needs.
WATER DEMAND

RIVERS PROVIDE 97% OF ALL THE WATER USED IN MALAYSIA
WATER DEMAND

WATER FOR ECONOMIC DEVELOPMENT

Provision of sufficient water to spur and sustain economic development

WATER FOR PEOPLE

Access to clean, adequate & affordable water

WATER FOR ENVIRONMENT

Protection of water environment to preserve water resources, bio-diversity, cultural heritage & mitigation water hazards

WATER FOR FOOD AND RURAL DEVELOPMENT

Provision of sufficient water to ensure national food security and rural development
EXISTING INSTITUTIONAL SETUP FOR WATER RESOURCES
PRESENT INSTITUTIONAL MANAGEMENT FOR WATER RESOURCES (SARAWAK)

Ministry of Planning and Resources Management

Natural Resources and Environment Board

Sarawak Water Resources Council

Planning and Management Committee

Public Awareness Committee

Water Catchment Area

State Water Authority

Ministry of Public Utilities

Water Supply Authority
PRESENT INSTITUTIONAL MANAGEMENT FOR WATER RESOURCES (SABAH)
WATER RESOURCES - ISSUES & CHALLENGES

• INCREASING DEMAND
• WATER AVAILABILITY
• FRAGMENTATION MANAGEMENT & JURISDICTION
• POLICIES ARE DIFFICULT TO IMPLEMENT
• LACK OF LEGAL & INSTITUTIONAL MECHANISM
<table>
<thead>
<tr>
<th>States</th>
<th>Land Area sq km</th>
<th>Total Consumptive Water Demand (MCM)</th>
<th>Effective rain (MCM/Year)</th>
<th>Excess/deficit (MCM) - Unregulated Flows</th>
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<td>2020</td>
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<td>1,985</td>
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<td>Total Malaysia</td>
<td>330,803</td>
<td>14,785</td>
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**IN RED BOXES: WATER DEFICIT**

Source: Review of National Water Resources Study 2015 - 2050
WATER RESOURCES – ISSUES & CHALLENGES

1. WATER DEMAND

- Increasing demand due to growing population, higher standard of living, expanding economy
- Competing uses of water from various sectors
- Uses and users varies from state to state
- Lack of effort on water demand management to reduce consumption & waste / NRW, reuse and recycle
- No control on abstraction and usage
- Competing demand
2. WATER AVAILABILITY VS DEMAND

- Abundant water resources
- Yet water resources are increasingly vulnerable / stressed by rapidly demand of water and shortage during dry periods as supplies are struggling to keep up with demand
- These challenges are even more pressing as we confront the treats of climate change, water and environmental degradation
- Deterioration of water quality and no sign of improvement
- Untapped alternative water sources
- Ground water largely untapped
- Frequent floods due to rapid urbanisation and development
- No more new sources due to insufficient surface water which are readily available and socially & economically acceptable
- Uncontrolled development encroaching catchment area resulted in depleting and unsustainable storage
3. MANAGEMENT & JURISDICTION

- Fragmentation of institution and legislation
- Sectoral in approach & gaps in jurisdiction
- Difficulties and deficiency in executing National Water Resources Policy
- Lack of legislative empowerment
- Lack of centralised database, manpower and personnel for water resources development and management
- No ‘one-stop agency’ for effective water management – working in co-ordination with the management of other natural resources such land, forest, minerals, biodiversity etc
- At state level – Difference in pace and approach in governance of water resources
- Uncoordinated use of water resources, abstraction of water
- Uncontrolled return of used water into the river system / receiving waters
- Insufficient attention given to needs of water for river system and environment
Droughts

Dry spell can hit Kedah’s 63,000 padi farmers soon

Planting season delayed by a month

By Abdul Razak Ahmad

Kuala Lumpur, Wed. — The current dry spell, which has not yet to water shortages in several states, soon, affect Kedah's 63,000 padi farmers. The planting season is usually followed by April and May. The soil moisture level is crucial for the start of the month, as it could lead to shortages during the next planting season.

The soil moisture level is currently at 30 per cent, which is considered to be critically low. The total rainfall is at 95 per cent, with the critical level at 65 per cent.

Senior citizens hard hit by water rationing

Cloud-seeding an uphill task

Malacca folk prepared for water rationing
Dams in S’gor drying up fast
Floods

Kuching 2003

Padang Kelab Selangor.... 1949

Kuala Lumpur, 2005

Shah Alam 2000

PJ, 2000

Tmn Sri Muda, Alam, Dec 1995
Major Flood Hit The State Of Kelantan In December 2014

Areal Photographs
THREATS FROM CLIMATE CHANGE

- Global warming created extreme variability in the climate
- This impact causes sea level rise and further extremes in the flood and drought situations of the country
WATER RESOURCES MANAGEMENT ISSUES

HOW DO WE MANAGE OUR WATER RESOURCES??

WHOSE RESPONSIBLE TO MITIGATE ALL THESE??

WHO REALLY MANAGE OUR WATER RESOURCES??
WATER REFORM TO IMPROVE WATER RESOURCES MANAGEMENT

• National Water Resources Council Formed in 1998

• National Water Policy Approved 2012

• Federal Constitution amended 2005 – transfer water supply services to the Concurrent List
  – Water as Resources – Planning, integrated and holistic approach - NRE
  – Water as Services – efficiency and improving service delivery- KeTTHA
  – Water for food - MOA
ISSUES PLAGUING WATER RESOURCES MANAGEMENT

- Legal Instrument – FRAGMENTED ??????
- Financial Instrument – NONE ???????
- Planning Instrument – IWRM → IRBM Plans → Implementation Effectiveness ???????
- Change focus from supply enhancement to DEMAND MANAGEMENT – NO CHAMPION ????
- Education & Public Awareness – ADHOC BASIS????
- PROGRESS WITH CURRENT PRACTICE IS TOO SLOW
Not all state complied
Good laws, but lax enforcement

THE Sabah Water Resources Enactment passed by the State Assembly in 1998 introduces various powers and responsibilities for water resources management, which includes the management of catchments.

Section 34(3) of the enactment, among others, specifies that a catchment management plan must include “a summary of all Federal and State legislation, relevant to water resources, including related land management legislation for protecting, using and developing land in the catchment”.

Another part of the clause states the need for “measures to address impacts on riparian and aquatic environment caused by changes to runoff rates and water quality”.

However, a cruise down Sabah’s longest river, the Kinabatangan, proved we have good laws, but not enough is being done to enforce them.

Oil palm trees and other crops, which have been planted right up to river banks, not only cause erosion but contribute to chemical waste...
CRITICISMS OF WATER LAW

“Malaysia suffers from a plethora of sector-based water laws, both at federal and state levels, and the lack of comprehensive water law. At present, water legislation is contained within the laws that are enforced by the various water related government agencies, and many of these laws are outdated, redundant or ambiguous. This diversified water legislation focuses on limited aspects of water resources and water supply directly related to the responsibilities of the respective government agencies and thus difficult to enforce effectively.”

ISSUES IN WATER LAW AND GOVERNANCE

• NUMEROUS FEDERAL LEGISLATION IN RELATION TO WATER

• BUT NO SINGLE COMPREHENSIVE WATER LEGISLATION

• EXISTING LAW GENERALLY CAME ABOUT AS BY-PRODUCT OF LEGISLATION THAT DEAL WITH OTHER SUBJECT MATTERS i.e. CONSERVATION OF ENVIRONMENT, FISHERIES, TOWN AND COUNTRY PLANNING, FORESTRY ETC.

• A LOT OF LOOP HOLE AND DIFFICULT IN ENFORCEMENT
RATE OF RIVER AND WATER POLLUTION CONTINUE TO RISE

- River water quality deteriorated with development – both point and non point source
- Out of 473 rivers monitored:
  - 278 = 59 % clean
  - 161 = 34 % slightly polluted
  - 34 = 7 % polluted

Sources: Environmental Quality Report, 2012
MALAYSIA : RIVER WATER QUALITY TREND

Sources: Environmental Quality Report, 2012
WHAT NEXT
HOLISTIC WATER RESOURCES MANAGEMENT FRAMEWORK

RESOURCE MANAGEMENT

Water in its Raw State
As a Resource

Returns Flow
As a Resource

STATE/ FEDERAL CUSTODIAN ROLE
• Access / Monitor Resources Availability
• Assure Resources Sustainability
• Allocate / Regulate
• Hazards Management
• Technical / Scientific Support, Awareness

SERVICES MANAGEMENT

Uses / Users:
Potable, Industries,
Agriculture, Mining,
Fisheries, Navigation,
Hydropower, etc

As a Services

SERVICE PROVIDER
Federal & State,
Private Entities
KETTHA, MOA, TNB etc
SPAN etc

Tools, Policy, Institution Arrangement
NWRP, IWRM, IRBM etc
HOLISTIC WATER RESOURCES MANAGEMENT

ENFORCEMENT

INSTITUTION

LEGISLATION

FINANCE

PUBLIC AWARENESS

PLANNING

PREVENTIVE

CURATIVE
ACTION PLAN

• ALL WATER RESOURCES FUNCTION TO BE CONSOLIDATED INTO ONE AGENCY
• CREATE OF MERGE EXISTING AGENCY WITH WATER RESOURCES FUNCTION CALLED WATER RESOURCES DEPARTMENT OR JABATAN PENGURUSAN SUMBER AIR (JPSA)
• RECONCILE EXISTING LAW REGARDING WATER BOTH AT FEDERAL AND STATE LEVEL CREATE SPECIFIC LAW FOR WATER
MODEL FRAMEWORK FOR INSTITUTIONAL ARRANGEMENT

- NATIONAL WATER RESOURCES COUNCIL (NWRC)
- MINISTRY OF NATURAL RESOURCES & ENVIRONMENT (NRE)
- NATIONAL WATER RESOURCES DEPARTMENT (NWRD)

USE SIMILAR MODEL AS FORESTRY OR LAND ADMINISTRATIVE ARRANGEMENT
MAIN FUNCTION OF PROPOSED WATER RESOURCES DEPARTMENT

**FEDERAL LEVEL**

- Policies and coordinating all state in water resources function
- Water resources assessment
- Water resources sustainable management
- Water resources allocation and regulation
- Water hazards management
- Water resources technical and scientific support
- Intra, inter and international water resources services

**STATE LEVEL**

- Implementing all water resources function
- State water resources assessment
- State water resources sustainable management
- State water resources allocation and regulation
- State water hazards management
- State water resources technical and scientific support
- State linkage with NWRD and others
CONCLUSION

• As Malaysia develops, problems relating to water and environment is expected to intensify

• Existing mechanism in managing water resources is inadequate and fail to protect

• To ensure sustainable development, water resources need to be managed in an integrated and holistic manner

• Political and administrative framework and commitment is vital to ensure success

• Management instrument with comprehensive legal framework are necessary
"Only after the last TREE has been cut down, only after the last RIVER has been poisoned, only after the last FISH has been caught, only THEN will you find that money CANNOT be eaten."

Cree Indian Prophecy

THANK YOU