

Integrated Water Resources Management Issues and Challenges: Case Study of Langat River Basin, Malaysia

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*Water in the Anthropocene:
Challenges for Science and Governance
Indicators, Thresholds and Uncertainties of the Global Water System
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INTRODUCTION

- *Water is vital for human survival and health, and it is a fundamental resource for sustaining human economic development. While water is a renewable resource, its availability in space (at a specific location) and time (at different periods of the year) is limited, being determined by climatic, geographical and political conditions, by affordable technological solutions that permit its exploitation, and by the efficiency with which water is conserved and used.*

INTRODUCTION

- **Today, the world's freshwater resources have become subjected to increasing pressure. Among the reasons why many people argue that the world is facing an impending water crisis are:**
 - ✓ **Water resources are increasingly under pressure from population growth, economic activity and intensifying competition for the water among users.**
 - ✓ **Water withdrawals have increased more than twice as fast as population growth and currently one third of the world's population live in countries that experience medium to high water stress.**
 - ✓ **Pollution is further enhancing water scarcity by reducing water usability downstream.**
 - ✓ **Shortcomings in the management of water, a focus on developing new sources rather than managing existing ones better, and top-down sector approaches to water management result in uncoordinated development and management of the resource.**
 - ✓ **More and more development means greater impacts on the environment.**
 - ✓ **Current concerns about climate variability and climate change demand improved management of water resources to cope with more intense floods and droughts.**

INTRODUCTION

- More and more countries are faced with increasing challenges related to water in their struggle for economic and social development, and Malaysia is no exception. With greater recognition of the IWRM process and its benefits in the context of sustainable development, IWRM has emerged as an accepted approach that can assist countries in their endeavour to deal with water issues in a cost-effective and sustainable way.*

Malaysian Context on IWRM

- *The Integrated Water Resources Management (IWRM) concept was first introduced in Malaysia in various forms in the early 1990s by water technical agencies such as the Department of Irrigation and Drainage (DID).*
- *It has already accepted as an innovative approach in managing its water resources.*
- *The formation of institutions such as the Malaysian Water Partnership (MyWP) in 1997 was also supported this initiative towards sustainable water resources management in Malaysia.*
- *Followed by the establishment of Malaysian Capacity Building Network for IWRM (MyCapNet) in 2001 to promote IWRM and capacity building in Malaysia.*

Malaysian Context on IWRM

- *IWRM is also in line with stated aspirations of Malaysian Government in different policy documents:*
 - ✓ *The Third Outline Perspective Plan, Malaysia (OPP3) 2001-2010*
 - ✓ *The 8th Malaysia Plan documents (MP8) 2001-2005*
 - ✓ *The 9th Malaysia Plan (MP9) 2006-2010*
 - ✓ *The 10th Malaysia Plan (MP10) 2011-2015*
- >> *emphasizes the need for IWRM and to build capacity for its implementation.*

National Policy Agenda on IWRM

Third Outline Perspective Plan (OPP3), Chapter 1, Paragraph 1.81:

“Effort to manage forests sustainably will be intensified and at the same time expanding the multiple use of forests, **steps will be taken to formulate integrated river basin management plans** to improve water quality and supply as well as managing water resources. To ensure sustainability of coastal resources **integrated coastal management plans** will be introduced in all states”

National Policy Agenda on IWRM

Eighth Malaysia Plan

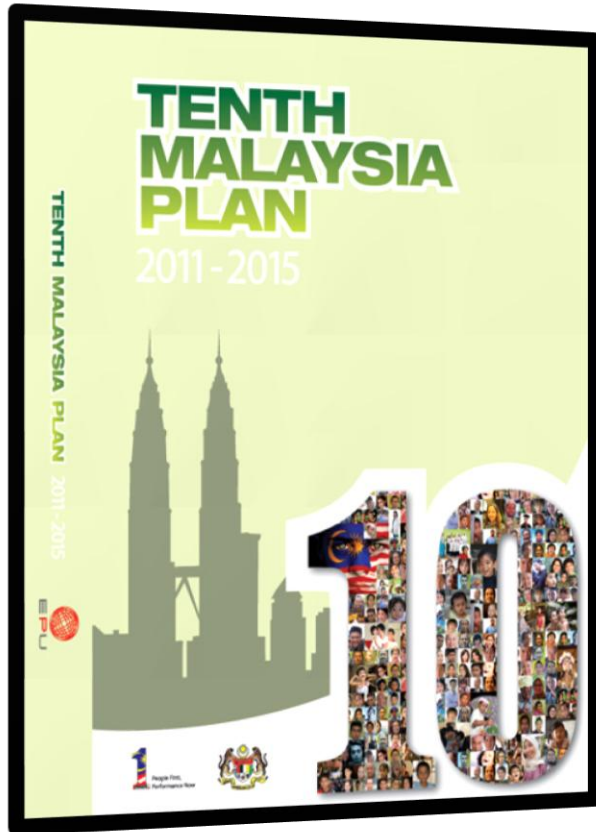
- IWRM approach has been endorsed under sustainable environmental management.

Ninth Malaysia Plan, Chapter 22, Paragraph 22.22:

The utilization of the integrated river basin management (IRBM) approach will be intensified to improve river and ground water quality. Besides, this plan also emphasized on following issues:

- To make efforts to protect and conserve land, water, biodiversity;
- To promote sustainable natural resource management practices in relation to land, water, forest, energy and marine resources;
- To make closer cooperation with stakeholders and non-governmental organizations (NGOs) in addressing environment and natural resource concerns; and
- To enhance protection of the environment and conservation of natural resources and contribute towards improving the quality of life.

10th Malaysia Plan



- Commitments through 10th Malaysia plan:

“The management of resources across the entire water cycle will be reassessed and that is from where water is drawn to how water is treated and supplied to citizens and how wastewater is returned to the environment.”

“To expand the implementation of Integrated Water Resources Management (IWRM) and Integrated River Basin Management (IRBM) approaches in planning, managing, protecting and rehabilitating water resources.”

Malaysia Water Vision

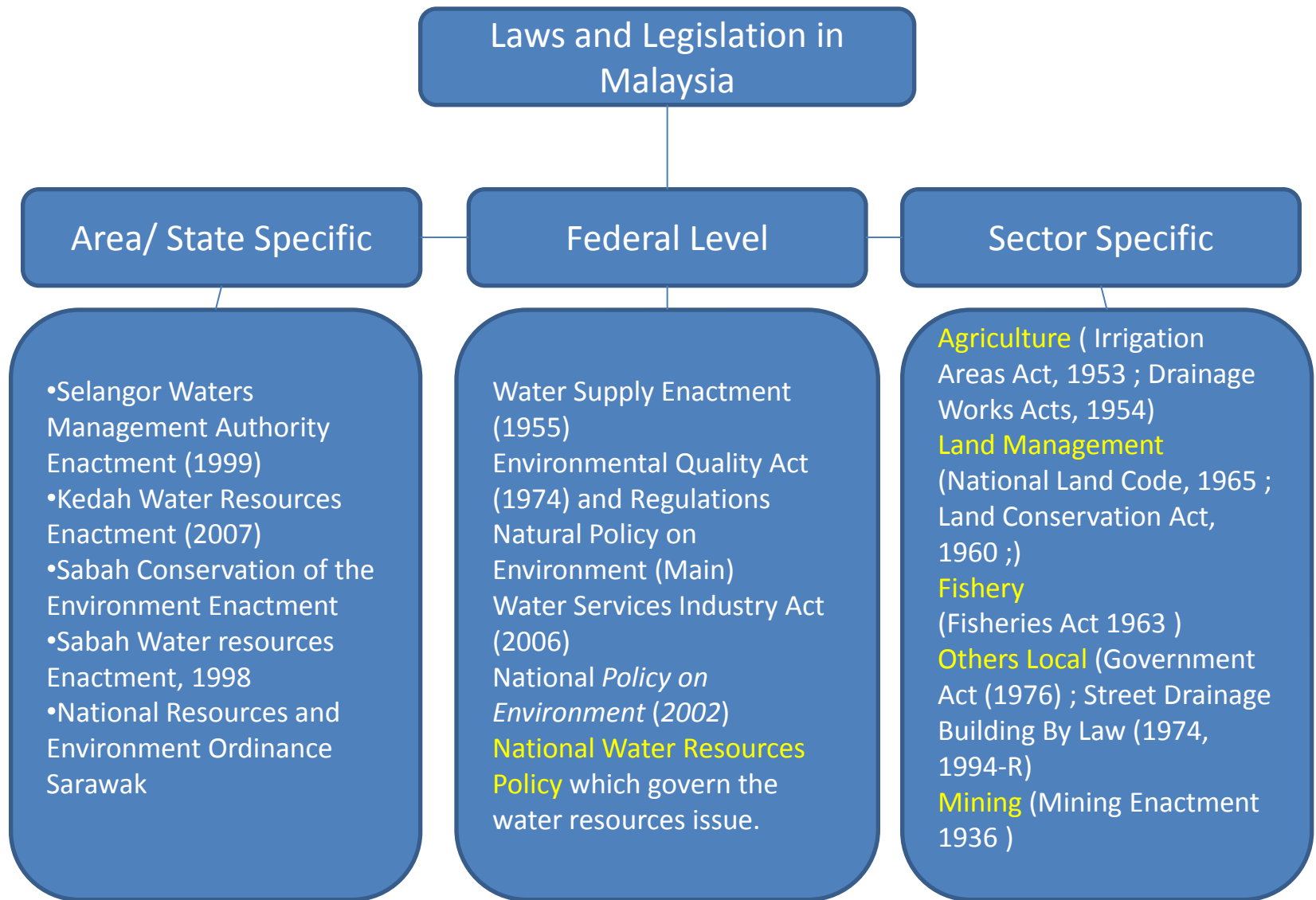
“In support of Vision 2020 (towards achieving developed nation status), Malaysia will **conserve and **manage** its water resources to **ensure adequate and safe water for all** (including the environment)”**

Key Objectives of the Vision

The key objectives of the vision are as follows:

- ***Water for people***: all have access to safe, adequate and affordable water supply, hygiene and sanitation.
- ***Water for food and rural development***: provision of sufficient water that will ensure national food security and promote rural development.
- ***Water for economic development***: provision of sufficient water to spur and sustain economic growth within the context of a knowledge-based economy and e-commerce.
- ***Water for the environment***: protection of the water environment to preserve water resources (both surface water and groundwater) and natural flow regimes, bio-diversity and the cultural heritage, along with mitigation of water-related hazards.

Laws and legislations



IWRM IMPLEMENTATION IN MALAYSIA

- *Malaysia is a signatory to several declarations of major global conferences (namely, the International Conference on Water and the Environment (in Dublin, 1992), Earth Summit (in Rio de Janeiro, 1992), World Summit on Sustainable Development (in Johannesburg, 2002) and World Water Forums (in Marakesh (1997); in the Hague (2000); in Kyoto (2003); in Mexico City (2006); in Istanbul (2009) and in Marseille (2012)) that acknowledged the international consensus on IWRM as the way forward for sustainable management of water resources.*
- *Consequent to this, Malaysia has embraced the IWRM concept and approach. The Department of Irrigation and Drainage (DID) together with the Malaysian Water Partnership (MyWP) have been the key drivers spearheading the initial IWRM movement in Malaysia.*

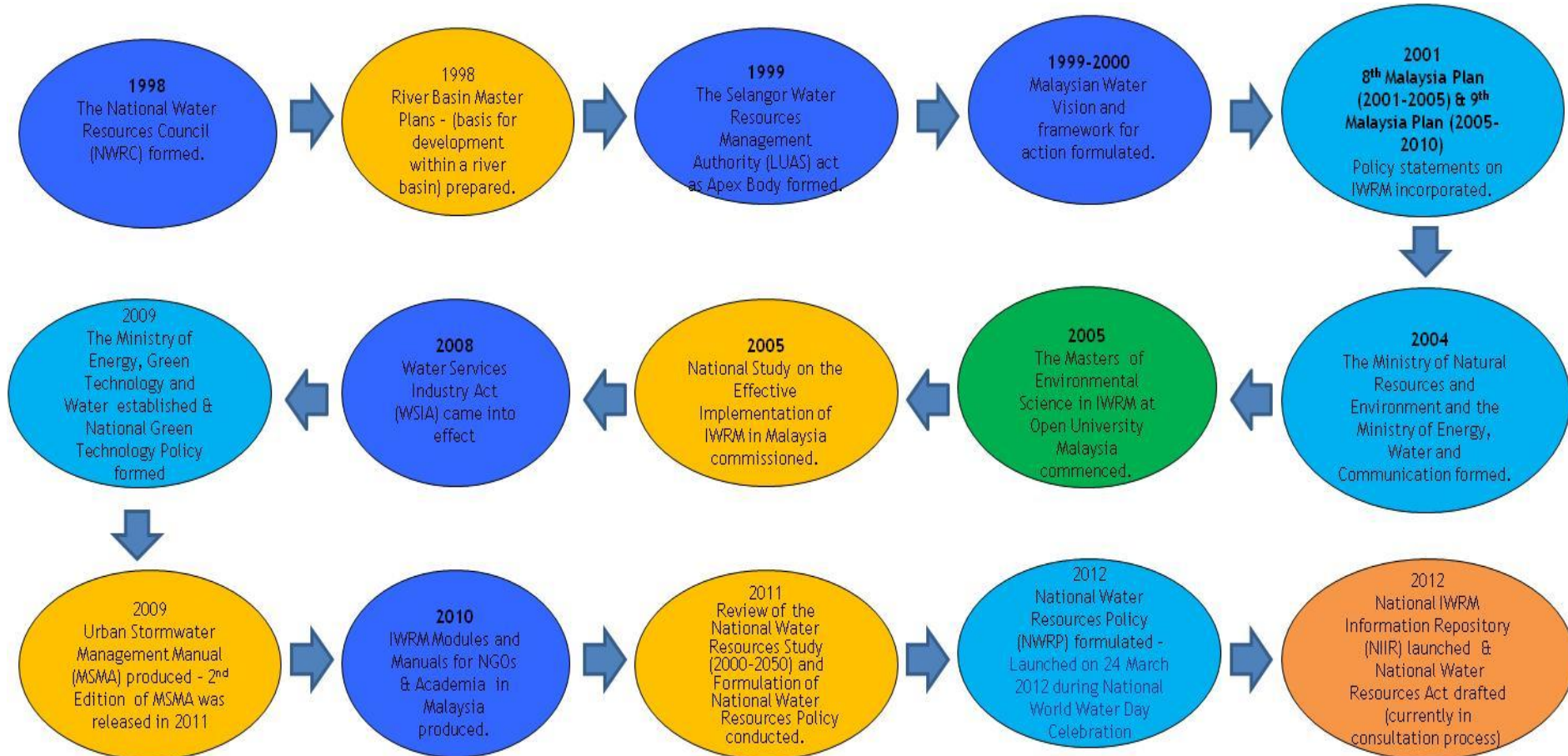
IWRM IMPLEMENTATION IN MALAYSIA

- *To date, the country has made considerable progress, especially at the national level, in applying and realising IWRM implementation.*
- *While Malaysia has achieved promising progress in realising IWRM to address the country's water resource management challenges, there is still a lot more issues that remain to be tackled and this would require continued effort.*

IWRM IMPLEMENTATION IN MALAYSIA

- *To date, the country has made considerable progress, especially at the national level, in applying and realising IWRM implementation.*
- *While Malaysia has achieved promising progress in realising IWRM to address the country's water resource management challenges, there is still a lot more issues that remain to be tackled and this would require continued effort.*
 - ✓ Water excesses - **during wet season**
 - ✓ Water shortages - **during dry season**
 - ✓ Water pollution
 - ✓ Threats from climate change
 - ✓ Current state of water governance

Key Milestones on Malaysia's Progress in IWRM Implementation



Langat HELP River Basin

Integrated water resources and river basin management concepts and approaches have been adopted and implemented in managing water resources in Langat River Basin, Malaysia. There are some issues and challenges faced in managing Langat River Basin. At the same times, there are also some initiatives and approaches undertaken to deal with these issues.



Overview of Langat River Basin

- One of UNESCO-IHP HELP Basins since 2004, classified as Evolving HELP Basin, out of 91 catchments from 67 countries in the world.
- Transboundary river basin – covers 3 states
 - Selangor (78%)
 - Negeri Sembilan (19%)
 - Federal Territories of Putrajaya (3%)
- Total basin area - 2,938 Sq. Km & 200 km long
- Population - 1,184,917 million in 2000, Growth rate 7.64%
- Geographical location - longitude 101°11' E to 102°01' E and latitude 2°33' N to 3°18' N



What is HELP?

- **HELP (Hydrology for Environment, Life and Policy) is a cross cutting and transdisciplinary initiative of the UNESCO led by the International Hydrological Programme (IHP) with objectives to deliver social, economic and environmental benefits to stakeholders through sustainable and appropriate use of water by directing hydrological science towards improved integrated catchment management basins and also implementation of research in collaboration between scientists, managers and stakeholders.**
- **HELP is creating a new approach to integrated catchment management through the creation of a framework for water law and policy experts, water resource managers and water scientists to work together on water-related problems.**
- **The selection has been made based on the international programme that is a catchment based activity which is interfacing scientific research with stakeholders needs.**

HELP CATEGORIES

- **Group D: World Demonstration HELP Basin**
This is seen as demonstrating best practice in HELP and IWRM, with something to offer other basins.
- **Group O: Operational HELP Basin**
This is an established basin which may become a World Demonstration Basin in due course.
- **Group E: Evolving HELP basin**
This is a basin which is not yet fully operational.
- **Group P: Proposed HELP Basin**
Additional information is needed to re-classify this basin.



United Nations Educational,
Scientific and Cultural Organization



Hydrology for the Environment, Life and Policy

Home to Water Portal

- Home to HELP
- About HELP
- News
- You and HELP
- Archives

HELP Action Areas

- Water and Climate
- Water and the Environment
- Water Quality and Human Health
- Water and Food
- Water and Conflicts
- Improving Communication

HELP Basins

Africa



Asia



Australasia



[Home](#) > [Langat \(Malaysia\)](#) - Updated: 18-10-2004 9:41 am

The Langat basin has been classified as an Evolving HELP basin.

Basin Properties

Geographical properties:

Longitude at River Outlet: 101° 17' and 101° 58' E

Latitude at River Outlet: 2° 44' and 03° 16' N

Area of River Basin: 2938 km²

Length of River: 120 km long

Altitude Range: 914 m

Average Annual Rainfall: 2469 mm or 1521–2883 mm

Average Rain days: 190

Average Temperature: 32° C

North America:

- Lake Champlain (USA-Canada)
- Lake Ontario (USA-Canada)
- Mystic (USA)
- Upper Washita (USA)
- Willamette (USA)
- Upper San Pedro (USA-Mexico)
- Luquillo Mountains (Puerto Rico)

Central and South America:

- Lerma-Chapala (Mexico)
- Cupatitzio (Mexico)
- Chaguana (Ecuador)
- Panama canal (Panama)
- Jequetepeque (Peru)
- Tacuarembó (Uruguay)
- Sao Francisco Verdadeiro (Brazil)

Europe:

- Karjaanjoki (Finland)
- Eman (Sweden)
- Nestos/Mestas (Greece-Bulgaria)
- Dragonja (Slovenia)
- Upper Danube (5 countries)
- Pilica (Poland)
- Pays de Savoie/Lac Leman (France)
- Hérault (France)

- Rhône (France)
- Liguria-Veneto (Italy)
- Saale (Germany)
- Motala (Sweden)
- Oona (Ireland)
- Eden (UK)
- Frome-Piddle (UK)
- Welland (UK)

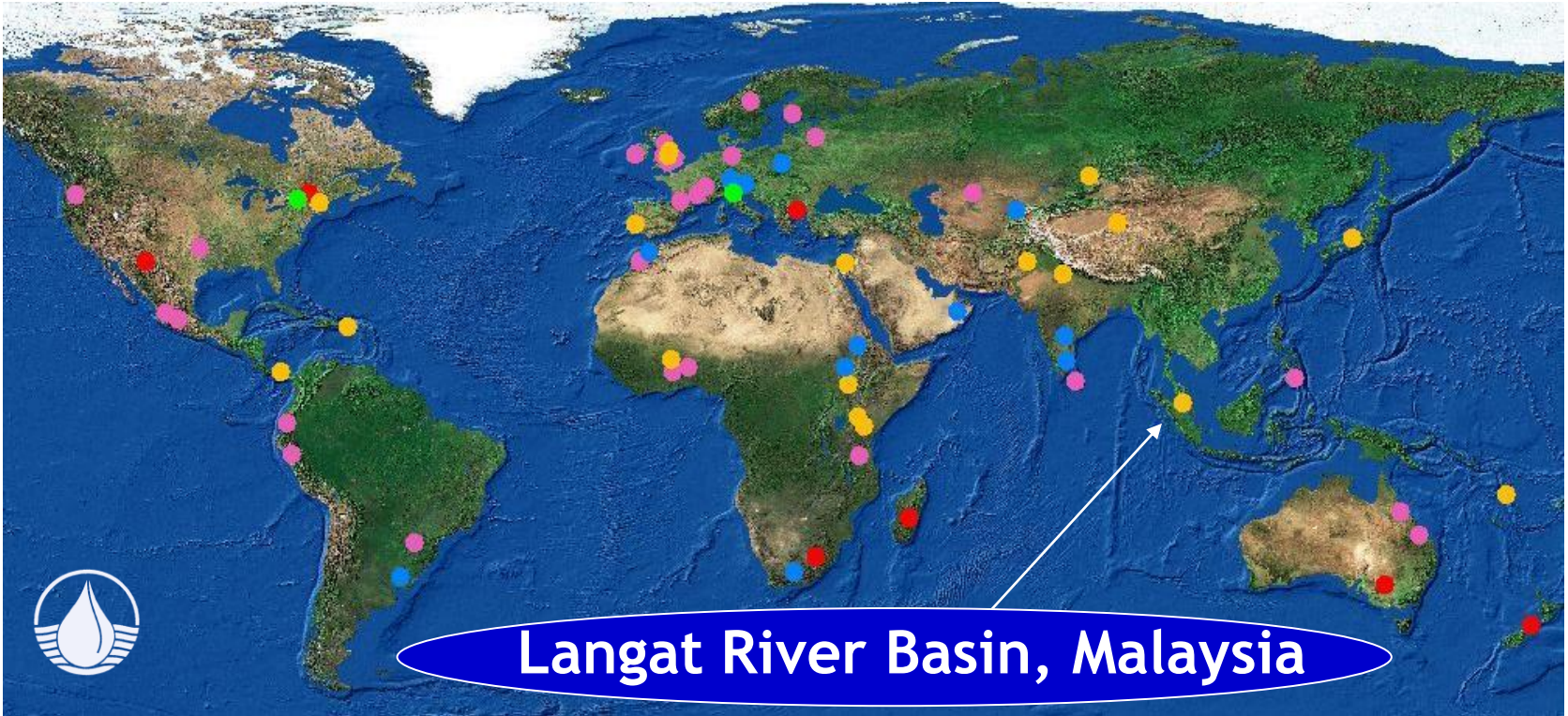
- Pang-Lambourn (UK)
- Tern (UK)
- Severn (UK)
- Thames (UK)
- Guadiana (Portugal)

Middle East:

- Khalil/Besor (Israel-Palestine)
- Barka (Oman)

HELP Basins Classification

-  Demonstration
-  Operational
-  Evolving
-  Proposed
-  Associated HELP Activities



Africa:

- Bouregreg (Morocco)
- Drâa (Morocco)
- White Volta (Ghana)
- Upper Ouémé (Benin)
- Atbara (Ethiopia-Eritrea-Sudan)
- Ewaso Ng'iro (Kenya)
- Lake Navaisha (Kenya)

- Nakambé (Burkina Faso)
- Gash (Sudan Ethiopia)
- Blue Nile (Sudan-Ethiopia)
- Mandaratsy (Madagascar)
- Olifants (South Africa)
- Thukela (South Africa)
- Greater Ruaha (Tanzania)

Asia:

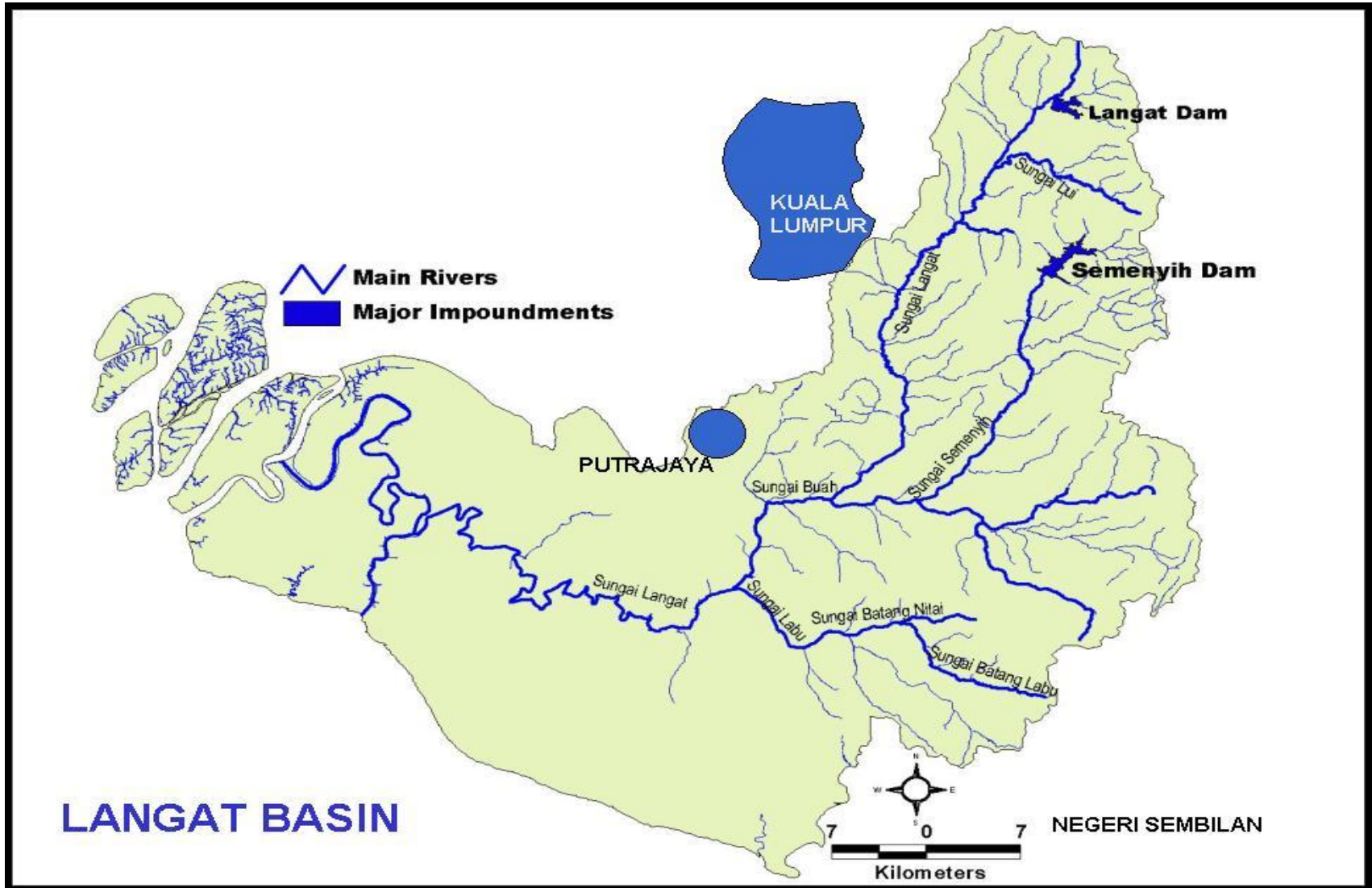
- Lake Peipsi/Chudskoe (Estonia-Russia)
- Indus (Pakistan)
- Aral sea (central Asia)
- Irtys (Kazakhstan-China-Russia)
- Chirchick (Uzbekistan)
- Tarim (China)
- Gagas (India)

- Kaluvelly (India)
- Brahmani-Baitarani (India)
- Langat (Malaysia)
- Uda Walawe (Sri Lanka)
- Davao (Philippines)
- Yasu (Japan)

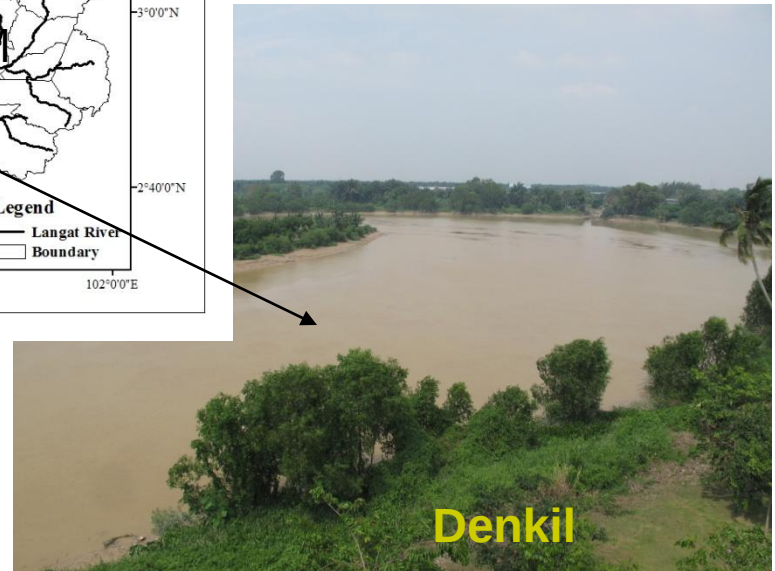
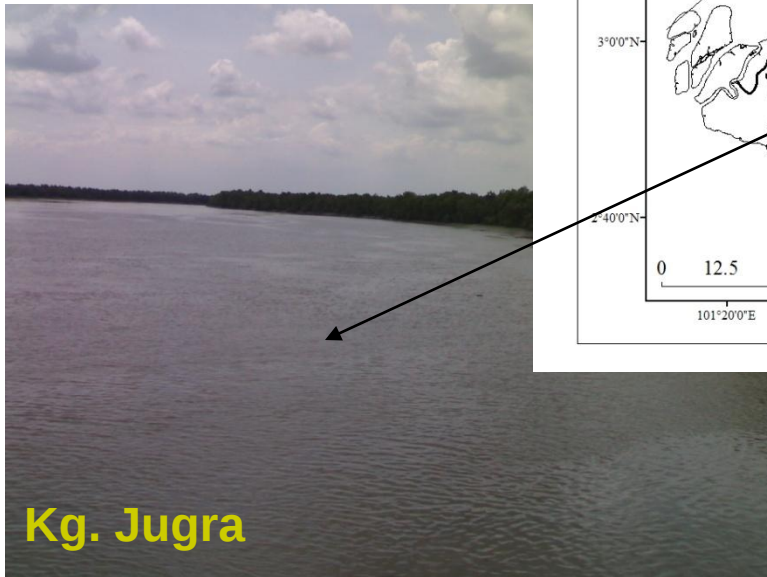
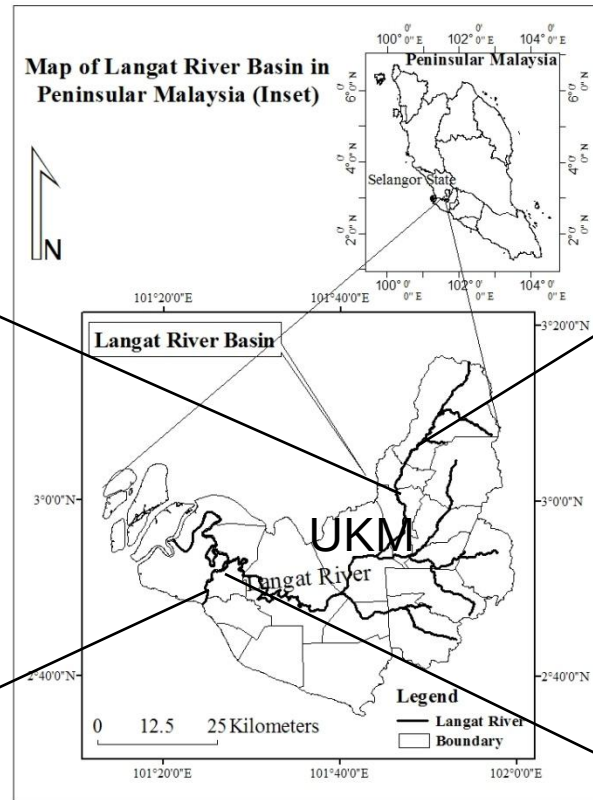
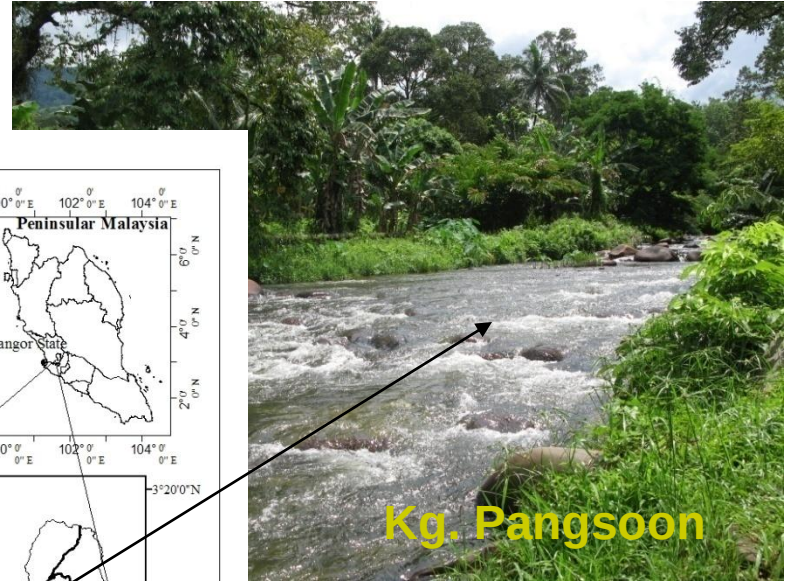
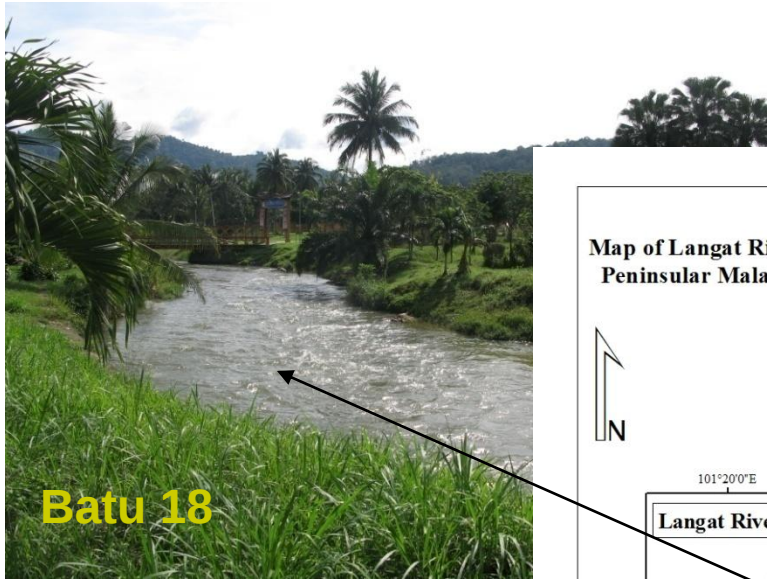
Australasia :

- Murrumbidgee (Australia)
- Fitzroy (Australia)
- Burdekin (Australia)
- Motueka (New Zealand)
- Talise (Vanuatu)

Where is Langat River Basin in Malaysia?



Langat River



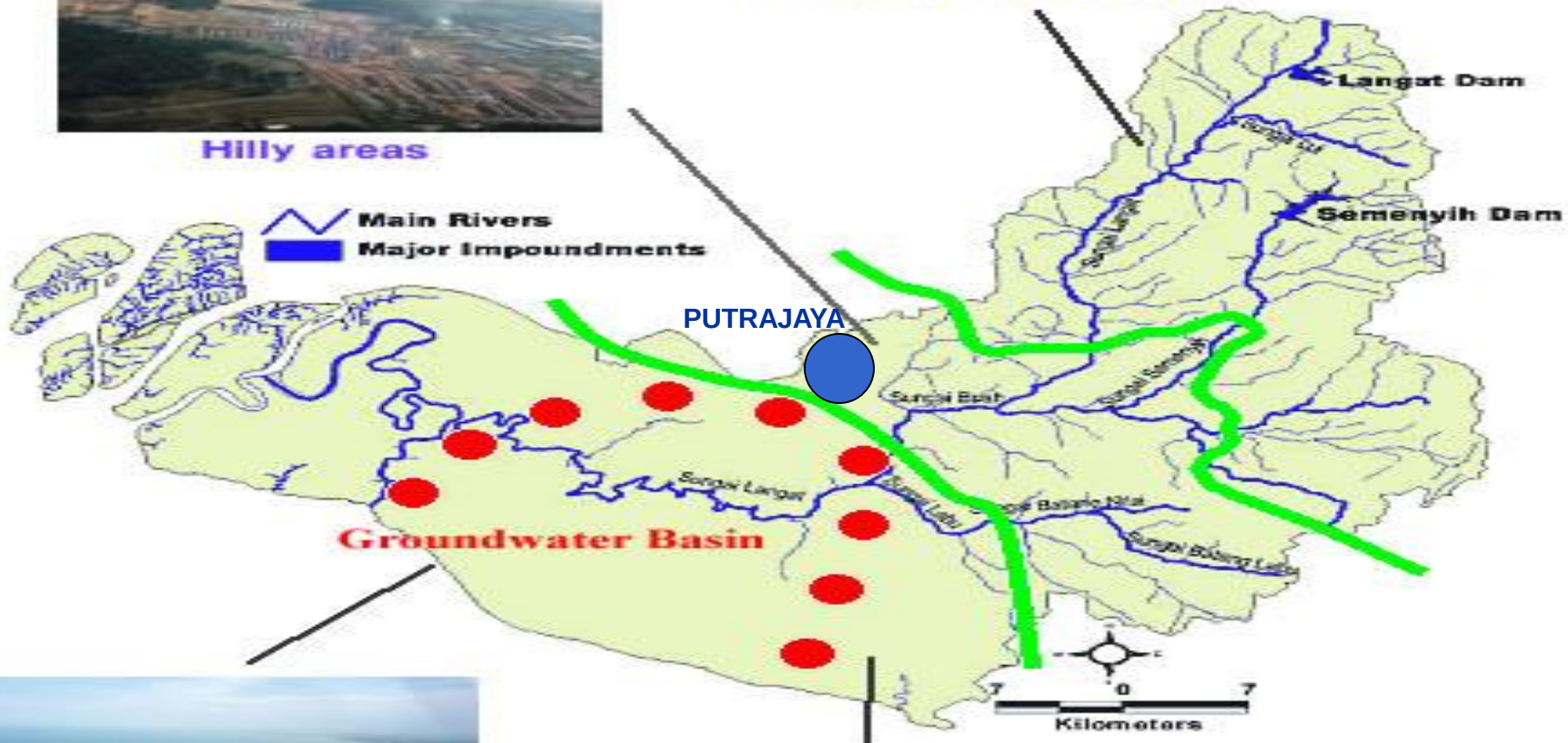
Topography & River System



Mountainous areas



Hilly areas



Seacoast



Flat lowlands

Langat River Basin – Socio-Economics

- The Langat River Basin, which is located adjacent to the highly developed Klang Valley metropolitan in Peninsular Malaysia is currently the fastest developing area in the country.
 - *The new township of Putrajaya (new Federal Government Administration Center)*
 - *The Multimedia Super Corridor (MSC) for the information technology industry*
 - *Cyberjaya (the paperless electronic village and township)*
 - *The Malaysian BioValley project for biotechnology research/industry*
 - *The Kuala Lumpur International Airport (KLIA)*
 - *The Formula One Grand Prix Circuit at Sepang*
 - *Several other institutions of higher learning including universities*

ISSUES AND CHALLENGES

- *The water in the basin is used mainly for agriculture/aquaculture and as water supply to major cities in the basin and to the adjacent Klang River basin where Kuala Lumpur is located.*
- *The demand for water for Year 2000 was 468 million liters/day and projected to increase to 2 141 million liters/day by 2050.*
- *The basin is able to produce 1 052 million liters/day currently but 65% of it is transferred to the adjacent Klang River basin.*
- *Water shortage is expected in the future as the population of the Langat Basin is estimated to double to two million by 2035.*

ISSUES AND CHALLENGES

- *The rapid urbanisation in the Basin has led to a large influx of people into the region.*
- *The Langat River is the main potable water resource for the whole Langat Basin and the Klang Valley (Kuala Lumpur) nearby where almost a million people depend on the Langat for drinking water.*
- *Many solutions and activities have been carried out to arrest the deterioration of the Langat River water quality but few have achieved success.*
- *The root to the problem is the absent of a truly integrated management system of water resources in the Basin.*

>> There is a need for IWRM practices and implementation at all levels.

Emerging Issues

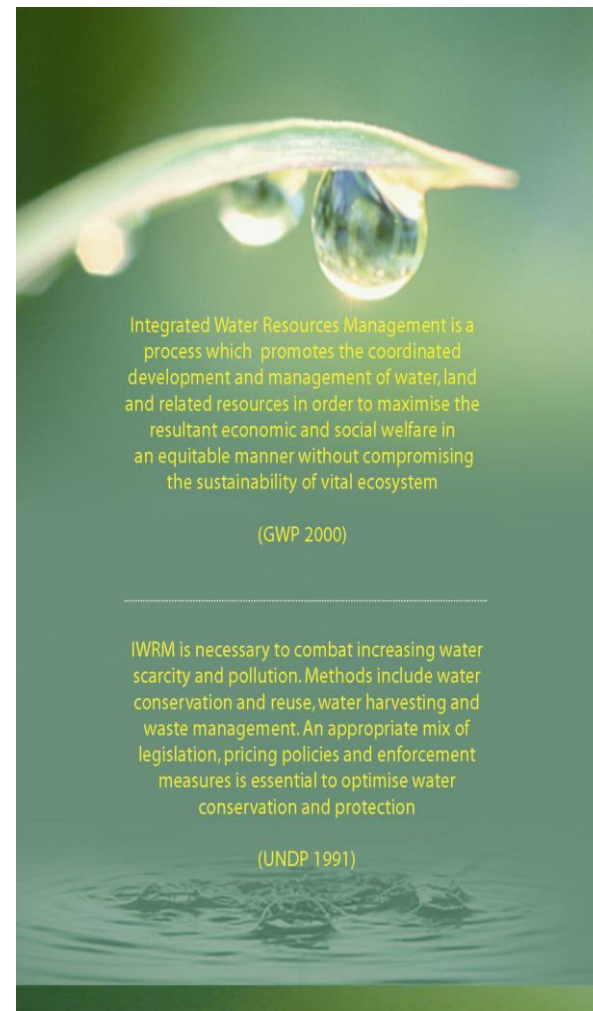
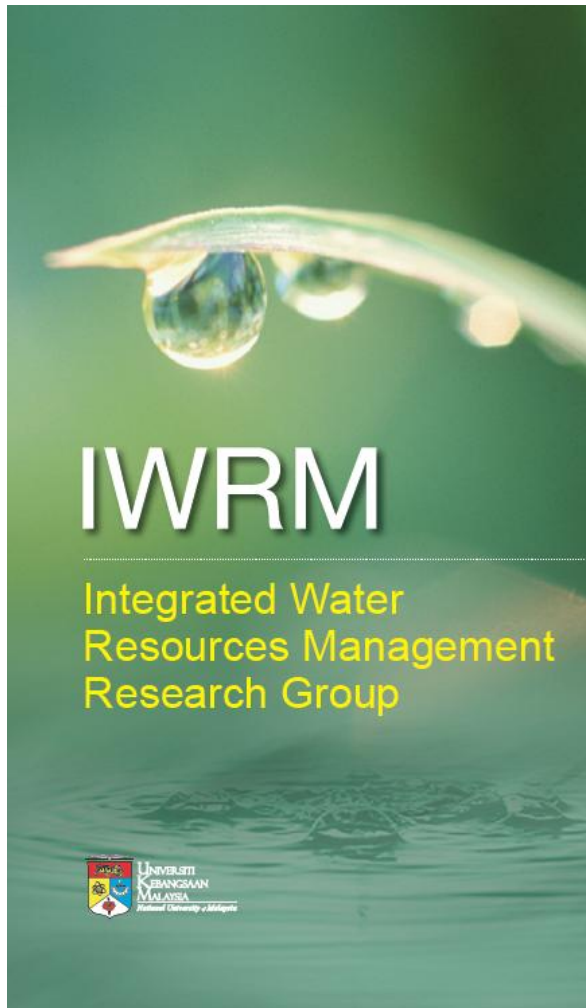
- *Conflict between federal and state governments*
 - *Water resource administration is fragmented*
 - *Coordinated approach to planning, development and management*
 - *Protection and conservation of water aspect*
 - *Land-use control and watershed management aspect.*
 - *A certain degree activities pertaining to realization of goals of an IWRM approach.*
- >> *The problem of integrated management lies in developing cooperation and collaboration among the agencies to ensure the well being of the basin itself.*
- >> *This includes issues of conflict resolution, information management and transboundary organization.*

STRATEGIC APPROACH

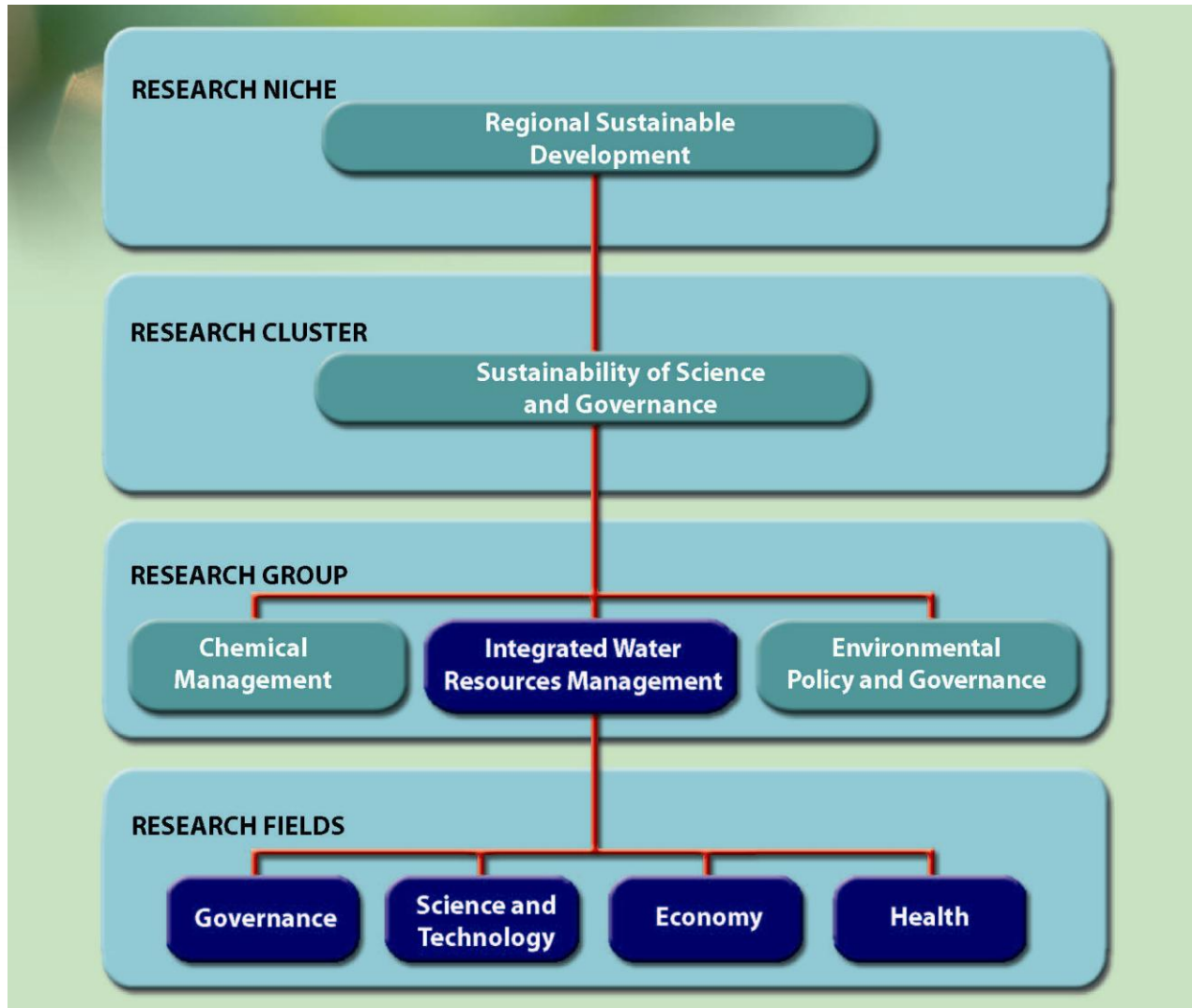
Integrated Water Resources Management Research Group of UKM

- The UKM's IWRM Research Group was formed in December 2007 under the Framework of Regional Sustainable Development Research Niche of UKM. The group consists of **lecturers and researchers from various faculties and institutes in UKM who are engaged in IWRM research and activities.**
- The research are mainly focused on four research fields, namely, **governance, science and technology, economy and health.**
- Some activities related to IWRM have already been **conducted and carried out at various levels involving multi disciplines and multi stakeholders as initiatives to move forward towards the implementation of IWRM in Malaysia.**
- The philosophy of the IWRM-UKM is that water is a finite resource to be managed sustainably to achieve a balance between competing water demand and supply through the application of knowledge and holistic institutional and ecosystem approach.

IWRM Research Group



IWRM RG Research Structure



STRATEGIC APPROACH

Research and Development on Langat Basin

- Focus on **Ecosystem Health** of the Langat River Basin
- Focus on **Integrated River Basin Management (IRBM)** of Langat
- Focus on **Water Quality** Monitoring and Improvement of Langat
- Focus on **Integrated Catchment Management** of Putrajaya Lake and Wetland (as part of Langat River Basin)
- Focus on **National Water Resources** Study (Including Langat)
- Focus on Participatory Management for IWRM through **Collaborative Decision Making (CDM)**
- Focus on **Developing Capacity** of Stakeholders in Malaysia (NGOs, Academia, Government Officer, Media, etc)
- Focus on **Regional River Basin** Issues
- Focus on **Water Borne Diseases** Management
- Focus on **Social Learning**
- Focus on **Harmonising Environmental Considerations** with Sustainable Development Potential of River Basins
- Focus on **Decision Support System (DSS)**
- Focus on **Watershed Sustainability Index (WSI)** at Catchment Level

STRATEGIC APPROACH

Participatory Management for IWRM through Collaborative Decision Making (CDM)

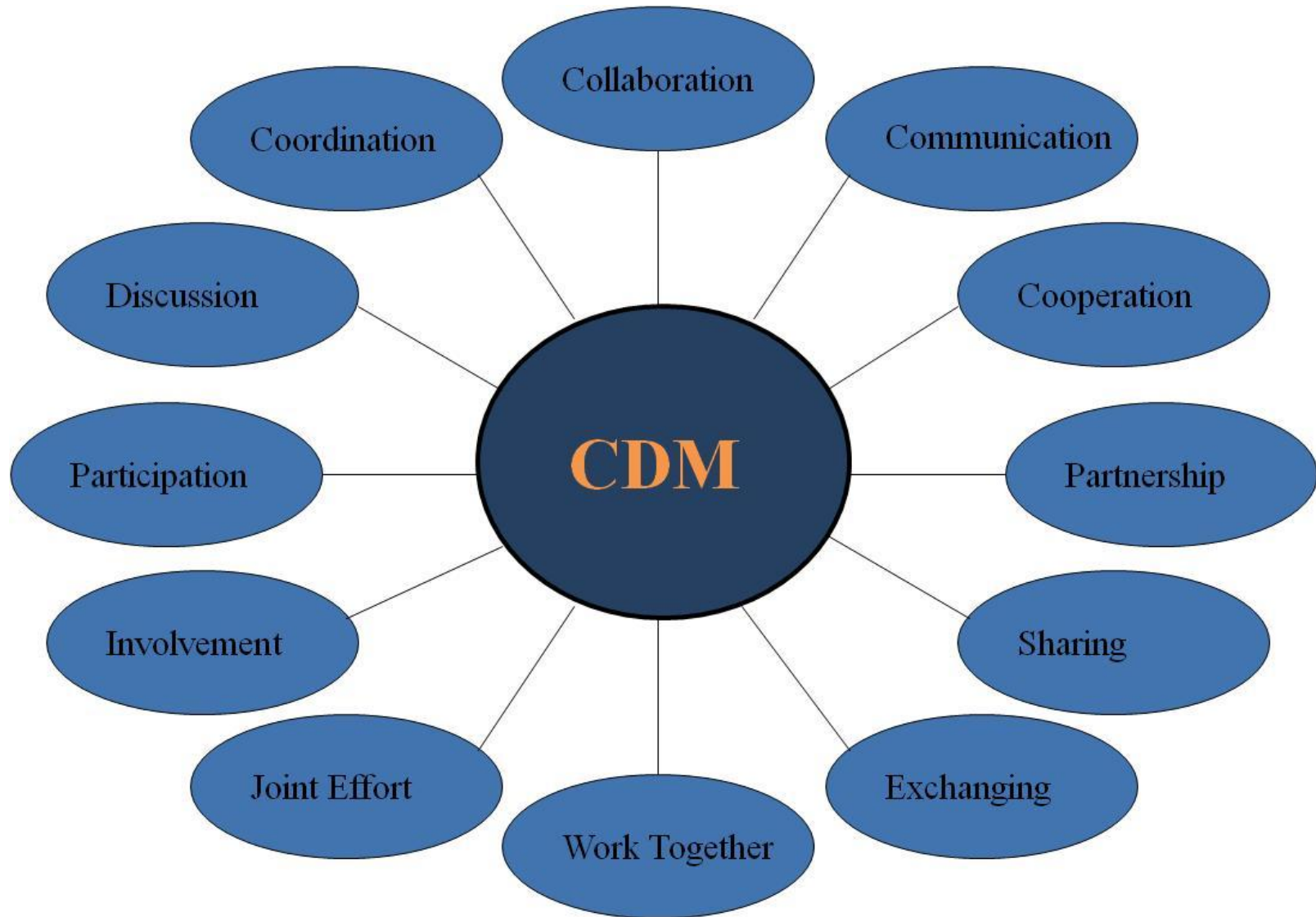
- CDM is an approach where individuals and organizations recognize their interdependence, communicate and agree to work together in **resolving environmental problems** and it can be used in water resources management related issues.
- It is an important mechanism in water resources management because of its potential in **improving the present water resources management system**.
- It is define as “**a joint effort among government agencies, private sectors, NGOs, the public, universities and other relevant stakeholders** aimed at improving the present management system through increased information exchange among the various parties in the community and improved decision support tools”.
- It require the **participation and involvement from stakeholders** within a larger context of shared understanding.
- Particular attention is paid to the issues that emerge as a result of **multiple stakeholder involvement** within environmental problem situations.

STRATEGIC APPROACH

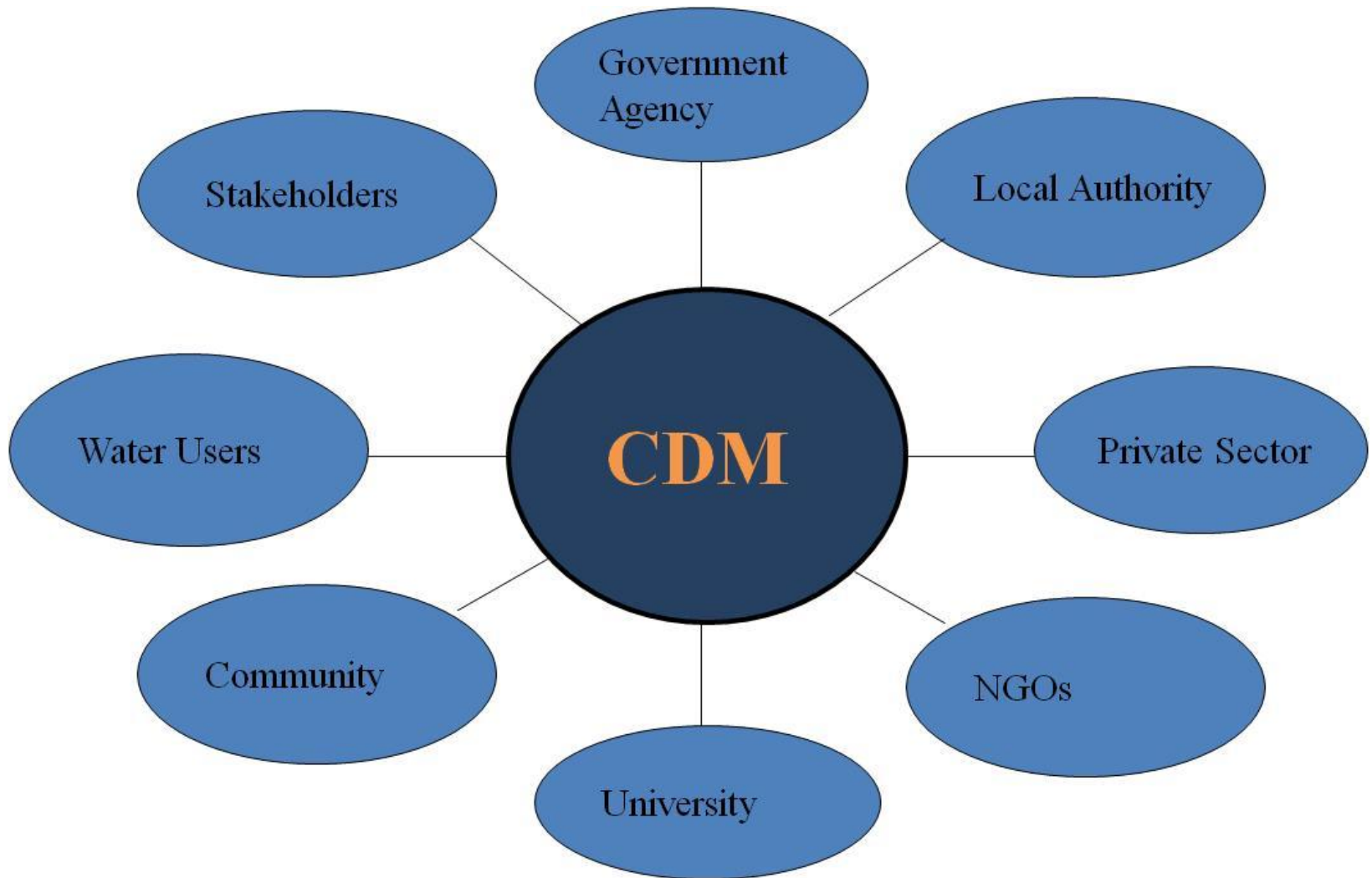
Participatory Management for IWRM through Collaborative Decision Making (CDM)

- CDM can be used as a tool in water resources management that needs involvement from various parties in making a decision or problem solving on issues that are related to water resources management in this country.
- In order to improve the existing water resources management system and to get a better decision in achieving the objectives that had been decided together.
- Not only will the CDM efforts improve efficiency in the water resources management, promoting better allocation of resources and improved water resources management, but also most important are the potential enhancements to get a better decision in every plan or action that will be made.
- Furthermore, CDM mechanism is implemented as a tool for resolving transboundary waters management issues and an approach towards sustainability of water governance. It is necessary for the concepts of IWRM and IRBM to be clearly understood and accepted as important components in the water resources and river basin management of Langat.

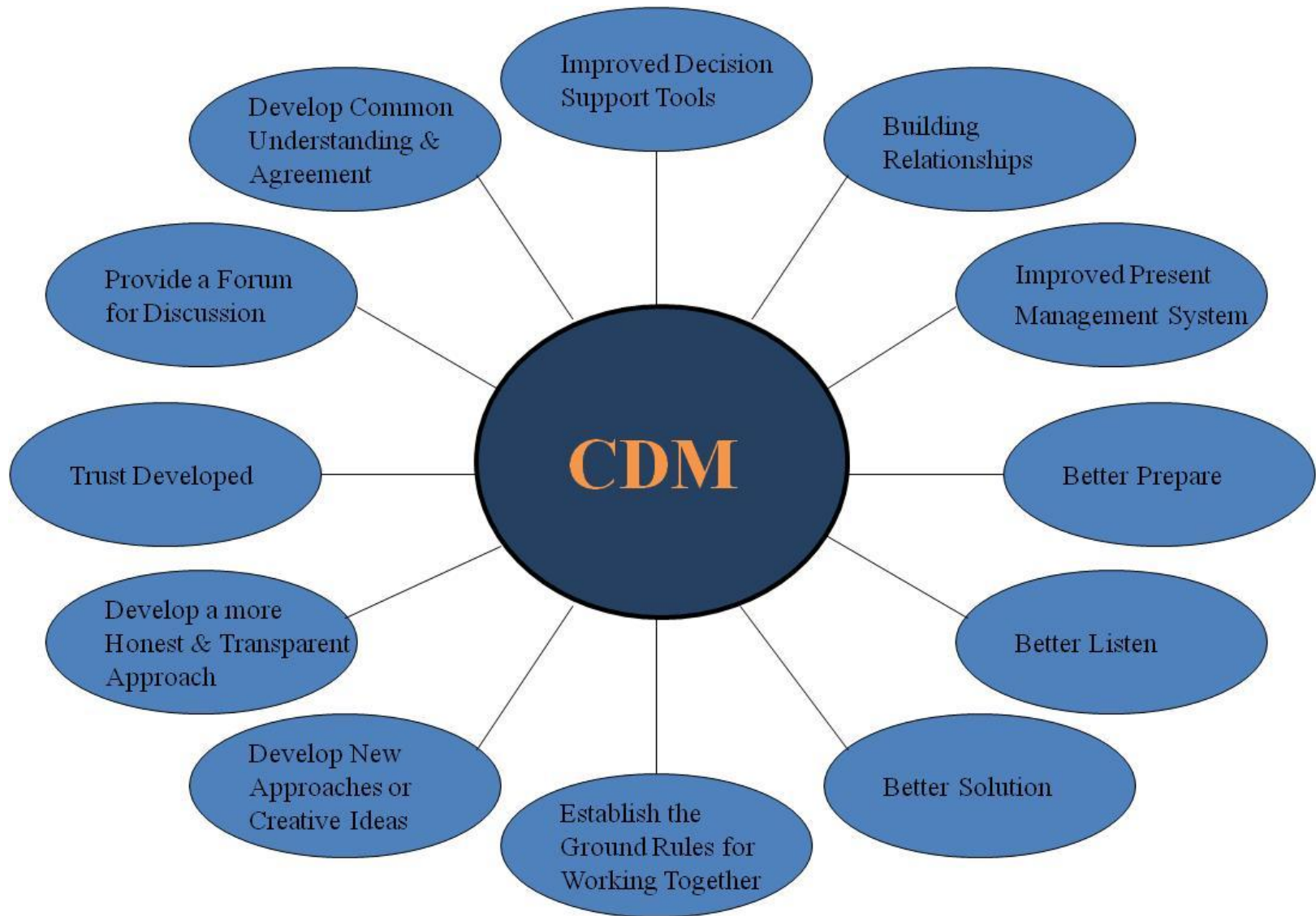
Key Elements of CDM



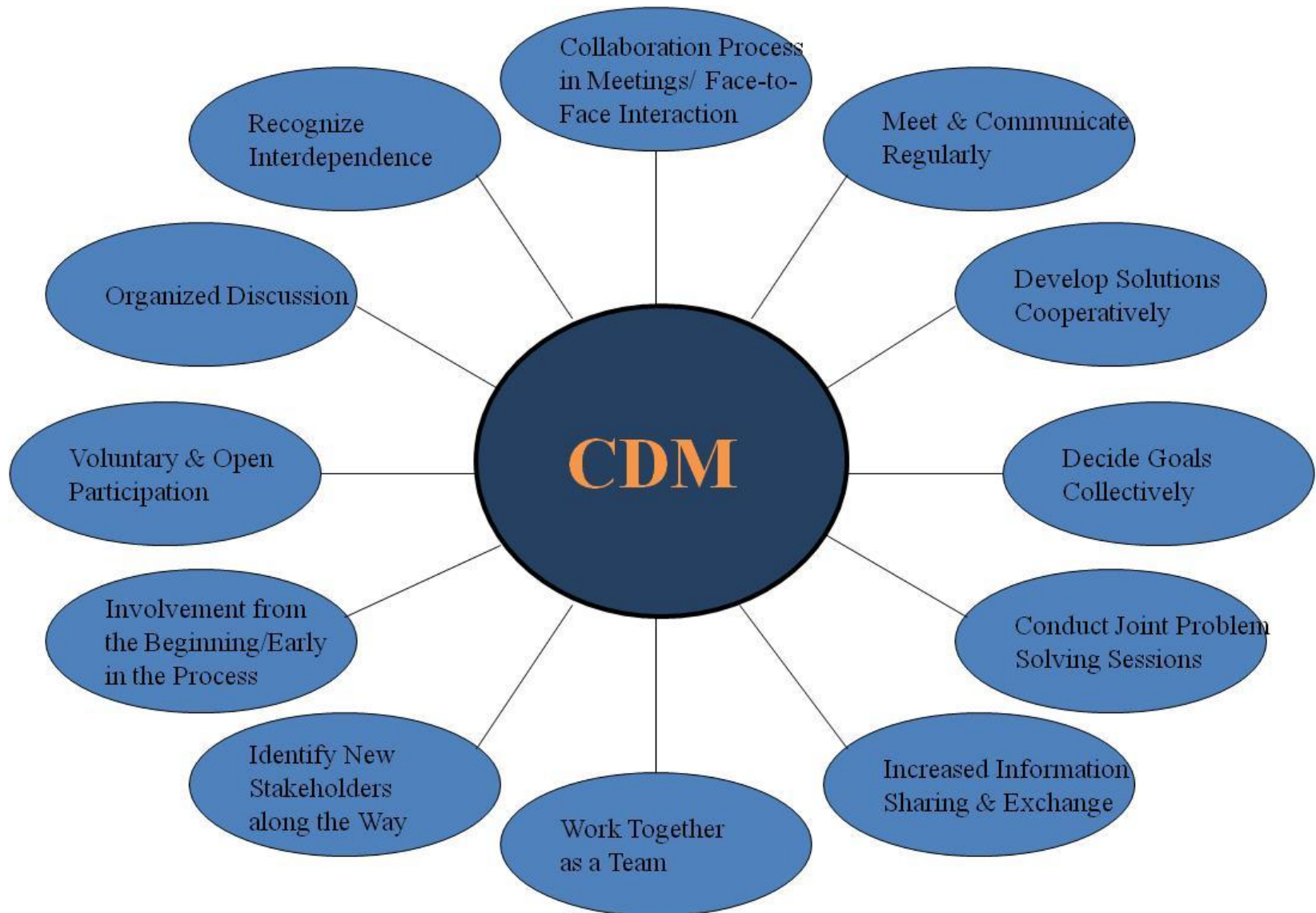
Participants of CDM



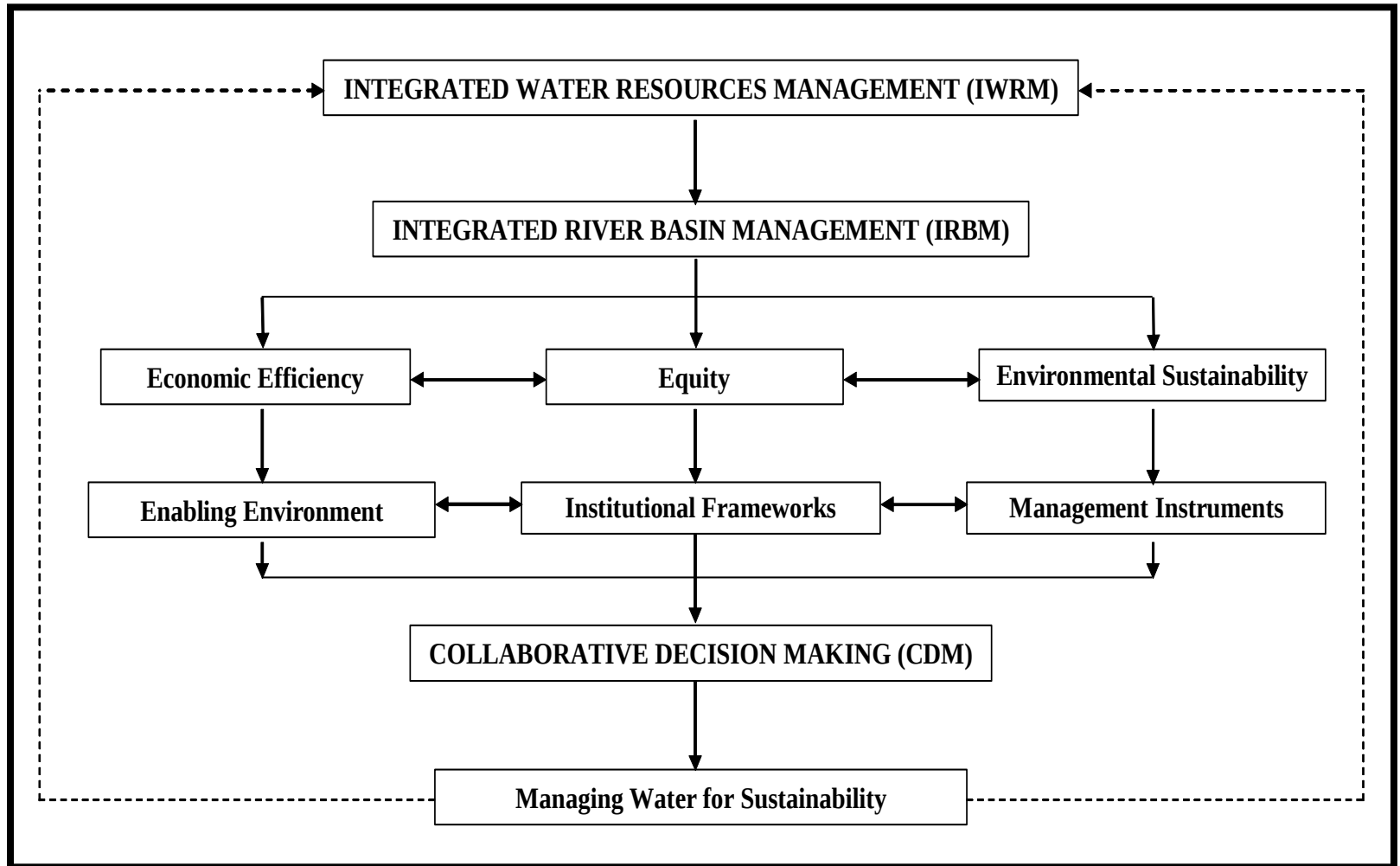
Importance of CDM



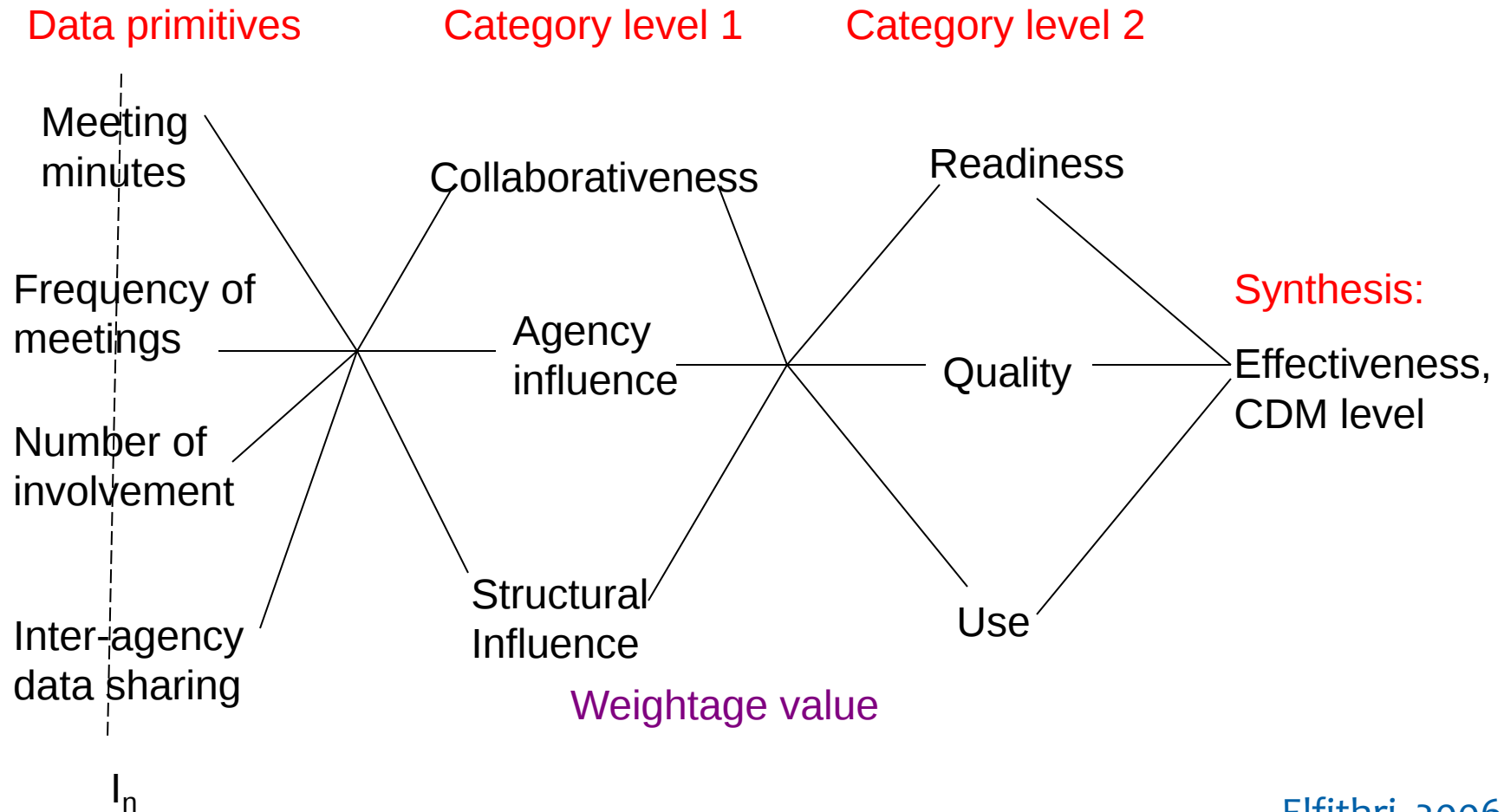
Mechanisms of CDM



FRAMEWORK OF IWRM AND IRBM THAT SHOWED THE IMPORTANCE OF CDM



Example of data mining procedure for CDM

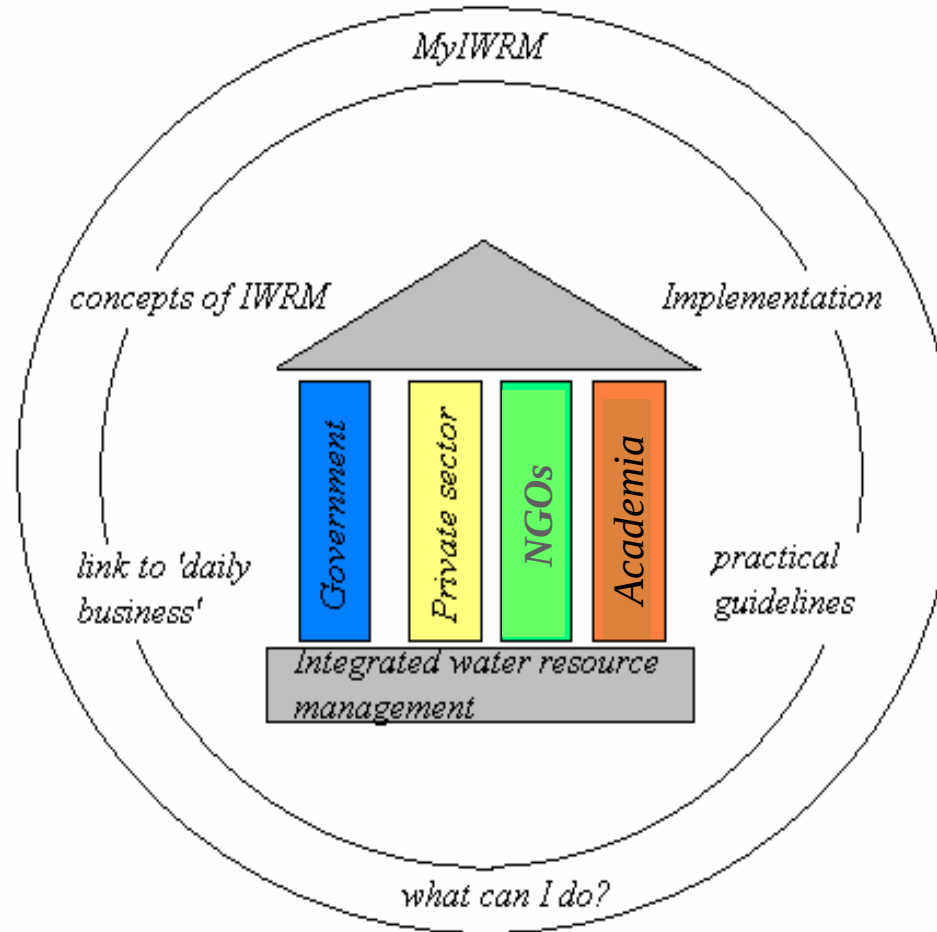


STRATEGIC APPROACH

“MyIWRM, what can I do? Developing Capacity for the Practical Implementation of IWRM in Malaysia”

- To really implement IWRM effectively in Malaysia, **all sectors need to be aware** what they can and should contribute to sustainably use the finite water resources in Malaysia.
- **Framework for the implementation of IWRM** as an overarching approach for sustainable use of water resources.
- Involving Federal and State Governments, private water supply companies, industries, agriculture, water treatment industry, universities, schools and NGOs.

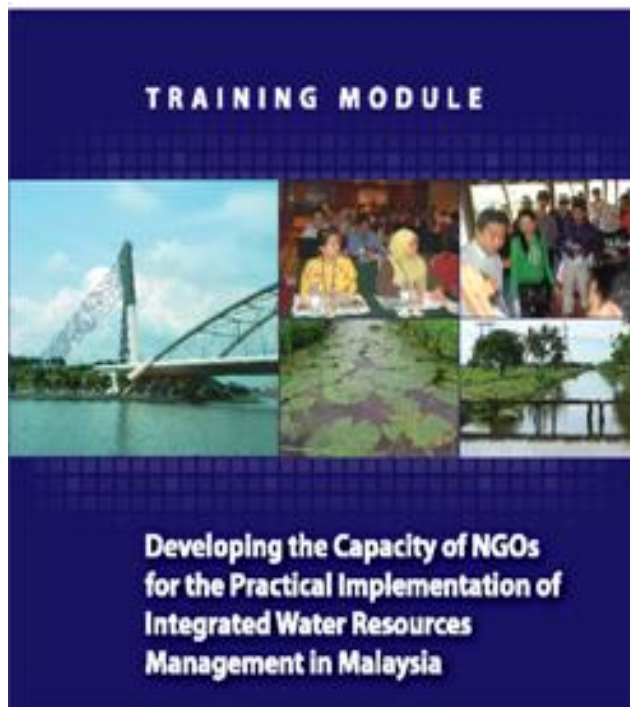
Relationship between the different parts of “MyIWRM, what can I do?”



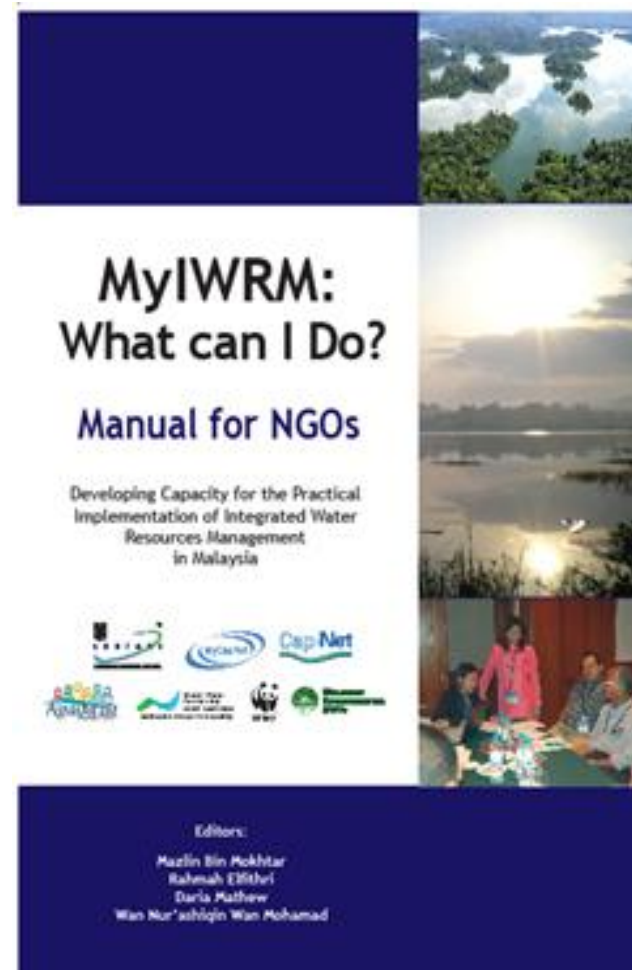
Training Course on Developing the Capacity of NGOs for the Practical Implementation of IWRM in Malaysia



Training Module and Manual for NGOs



Editors:
Mazlin Bin Mokhtar | Rahmah Elithari
Daria Mathew | Wan Nur'ashiqin Wan Mohamad

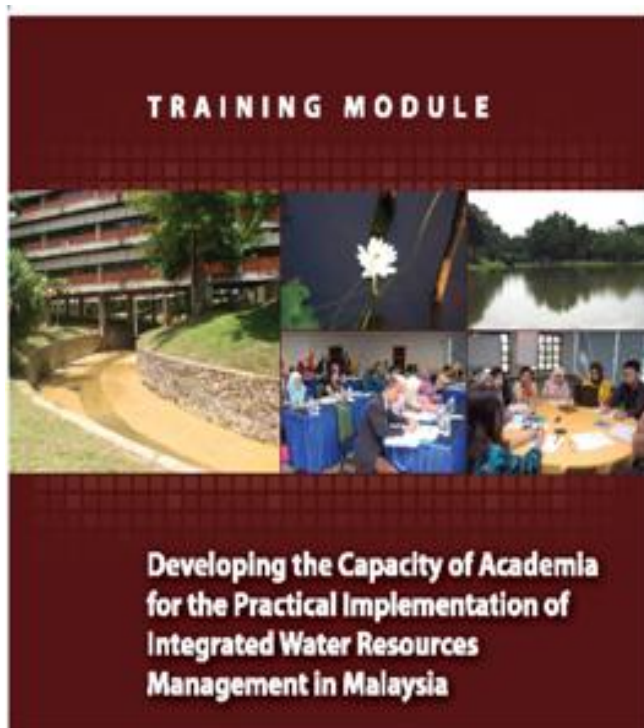


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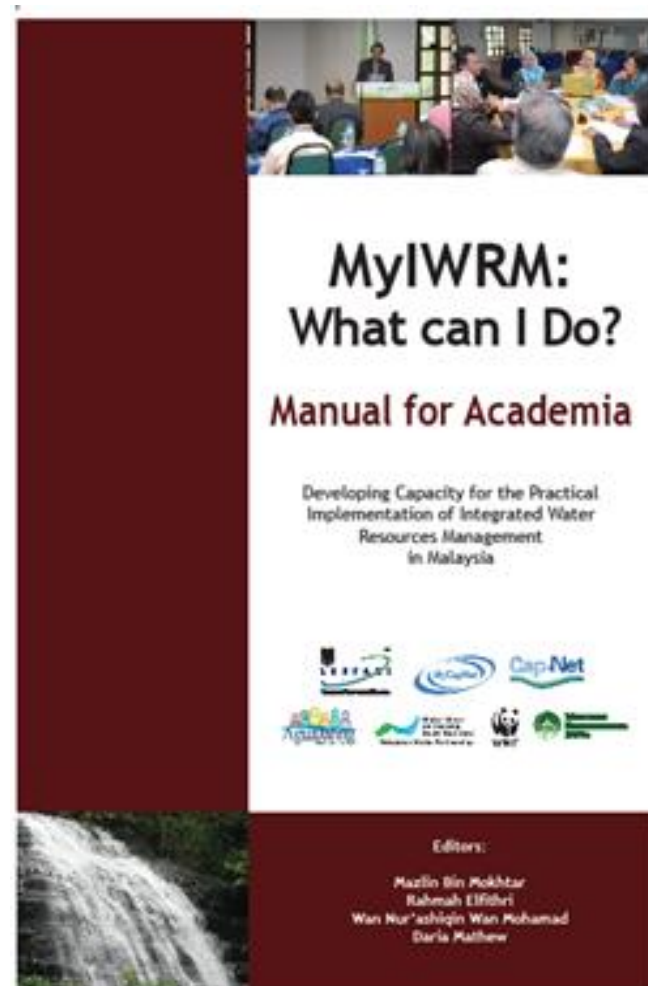
Training Course on Developing Capacity of Academia for the Practical Implementation of IWRM in Malaysia



Training Module and Manual for Academia



Editors:
Mazlin Bin Mokhtar | Rahmah Elfidri
Wan Nur'ashiqin Wan Mohamad | Darla Matthew



MyIWRM: What can I Do? Manual for Academia

Developing Capacity for the Practical
Implementation of Integrated Water
Resources Management
in Malaysia



Editors:

Mazlin Bin Mokhtar
Rahmah Elfidri
Wan Nur'ashiqin Wan Mohamad
Darla Matthew

Training Course on

DEVELOPING CAPACITY OF GOVERNMENT OFFICERS FOR THE PRACTICAL IMPLEMENTATION OF INTEGRATED WATER RESOURCES MANAGEMENT IN MALAYSIA

2nd & 3rd November 2010

Puri Pujangga, UKM, Bangi, Selangor



TRAINING OBJECTIVES

1. To develop capacity of Government Officer for the practical implementation of IWRM in Malaysia.
2. To increase awareness of Government Officer on IWRM concepts and principles.
3. To highlight issues and challenges of IWRM in Malaysia.
4. To further scrutinize the role of Government Officer in IWRM and enhance numbers of Government Officer to be involved and participated fully in IWRM and IRBM processes.
5. To provide knowledge for effective management of water resources in Malaysia, through a case study.

TARGET GROUP

All Government Officer especially Department of Irrigation and Drainage (DID) officer for the whole Malaysia (including Peninsular Malaysia and Borneo Part of Malaysia) will be trained using the available Training module and Manual that will be modified to suit the government needs.

DATE & VENUE

The Training Courses will be organised on 2-3 November 2010 (Tuesday and Wednesday) at Puri Pujangga, UKM Bangi, Selangor.

Organised by :





Workshop on Water and Media :Rising up to the Challenge

In Conjunction with Malaysia World Water Day 2011
21-22 March 2011 | Perbadanan Putrajaya

Organised by



Institute for Environment and
Development



UNESCO-IHP Malaysia



Department of Irrigation
and Drainage



Malaysian Country Water Partnership
Malaysian Country Water
Partnership



Perbadanan Putrajaya

In Collaboration with



Ministry of Natural
Resources and Environment



Ministry of Energy, Green
Technology and Water



Ministry of Housing and
Local Government



International Symposium _{on} Harmonising Environmental Considerations with Sustainable Development Potential _{of} River Basins

In Conjunction with Malaysia World Water Day 2010

Organizer



Hydrology for the
Environment, Life and Policy



24th - 26th March 2010
Prince Hotel & Residence
Kuala Lumpur, Malaysia

Symposium Objectives

- Identify issues and challenges related to water governance, environmental and sustainable development potential of river basin from the perspectives of various stakeholders.
- Priorities issues for possible adaptation and business opportunities for water sector to integrate into an expanding environmental services industry.
- Provide a platform introducing HELP programme and sharing ideas between the HELP Basins in the world about the implementation of existing challenges, knowledge and activities within the local condition.



UNESCO-IHP HELP SYMPOSIUM ON Harmonising Environmental Considerations with Sustainable Development Potential of River Basins, 24-26 March 2010, Kuala Lumpur, Malaysia

What We Have Achieved on Langat River Basin (LRB)?

- LRB is recognized as HELP Evolving River Basin under UNESCO HELP Programme.
- IRBM process has been introduced in LRB since 1999
- Research network has been developed
- Inter-organizational network has been functional through LUAS
- River Basin Enactment has been enacted since 1999
- HELP principles have been followed for river basin management
- LRB has its own IRBM plan
- IRBM Plan is under implementation by concerned agencies
- Water supply service and sanitation services have been improved
- Self financing ability is improving within LUAS
- Certain level of stakeholders are involved in decision making
- Different agencies are reporting their activities in the respective annual reports
- Higher level research like Masters and PhD level research work have been carried out on Langat River Basin.
- Stakeholder participation issues are brought under formal higher level research.
- Already experiencing IRBM implementation by following IRBM plan.

What More Should Be Done?

- The main challenge of the basin is on how to improve the current status of Evolving River Basin to become operational or demonstration basin in the future.
- It involves the “know how” to **dialogue with stakeholders** in Langat River Basin which involved various stakeholders in different area and jurisdiction, the “know how” to **interface the water law and policy and governance**, the “know how” to **undertake the necessary scientific research** where basin scientific infrastructure is lacking, the “know how” to **develop criteria to better define “vulnerable” basins to global change**, the “know how” to **address upstream-downstream issues within IWRM from both a technical, management and policy perspective**, and the most important thing is the “know how” to **use the HELP approach to address national and transboundary basins policy issues** connected with intra and inter basin conflicts connected with surface water and groundwater.
- Some achievements have been made to bring Langat at the national and international arena, need to be further improved.

WAY FORWARD

- *The Langat Basin needs a very careful management and development plans for its water resources to ensure its sustainability.*
- *Sustainable efforts and commitments are very important and need to be further strengthened in order to sustain the water resources management in this basin.*
- *IWRM is needed to be implemented as a practical approach toward sustainable water resources management in this basin.*
- *The collaboration and cooperation from all related stakeholders in Langat River Basin are very important to upgrade the present status of Evolving HELP Basin to Operational HELP Basin or Demonstration HELP Basin for Langat River Basin.*
- *There is a need critical mass for organisational change at catchment level and also commitment from all levels to solve the problem at the Langat River Basin.*
- *All these contributions would be useful to the improvement of R & D work on Langat River Basin.*

CONCLUSION

- *Water as a Resources need to be conserved and preserved sustainably.*
- *Management of water and river basin is based on the physical/geographical boundaries and not on the administration boundaries.*
- *IWRM is achieved by collaboration and partnerships.*
- *Effective implementation of IWRM contributes to the realization of water security and water sustainability for the country and the world.*

THANK YOU

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Integrated approach; way forward.....