

The logo for NARBO (Network of Asian River Basin Organizations) features the word "NARBO" in a bold, blue, sans-serif font with a yellow outline. To the right of the text is a stylized globe with blue and white segments, representing the Asian continent.

Network of Asian River Basin Organizations

NARBO 8th Training Programme



Enhanced Water Security Through IWRM–Mahaweli Experience

27th November –4th December 2013

MAS Fabric Park Thulhiriya,
Sri Lanka

Group Presentation

Group 10 Nepal (Bagmati River Basin)

4th December , 2013

Group Members

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Presentation Content

- ▶ Introduction
- ▶ Current Issues on Water Resource management
- ▶ Potential Issue in Futures
- ▶ Keys for Success
- ▶ Implementing IWRM
- ▶ IWRM spiral
- ▶ Differences in spiral and basin
- ▶ Discussion

Introduction

➤ Country divided into three physiographic regions

- Terai (Plains)
- Mid-hills
- High Himalayas

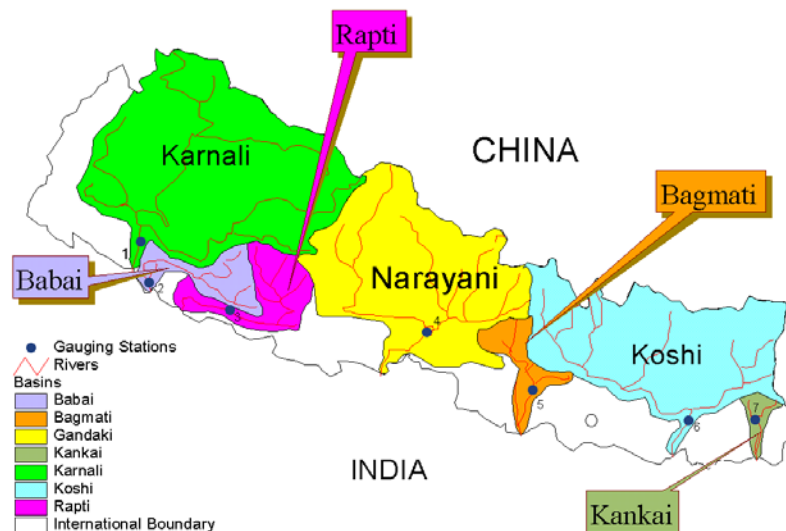
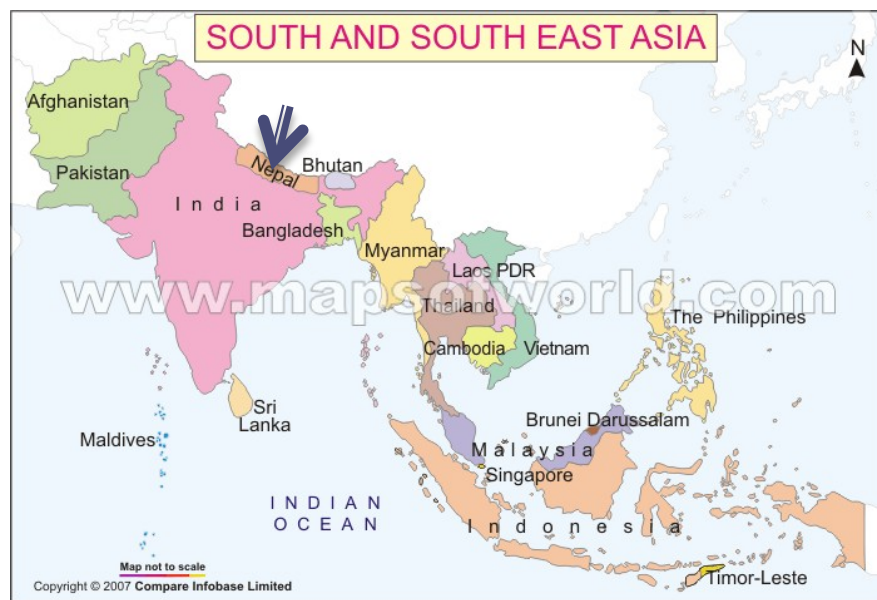
➤ about **6000 rivers** in Nepal

➤ **surface water** available in the country is estimated to be about **225 billion m³** annually

➤ estimated **ice reserve of 481 km³**

➤ shallow and deep aquifers are estimated to be **8.8 BCM** annually

☐ only **15 BCM per annum** is in use.

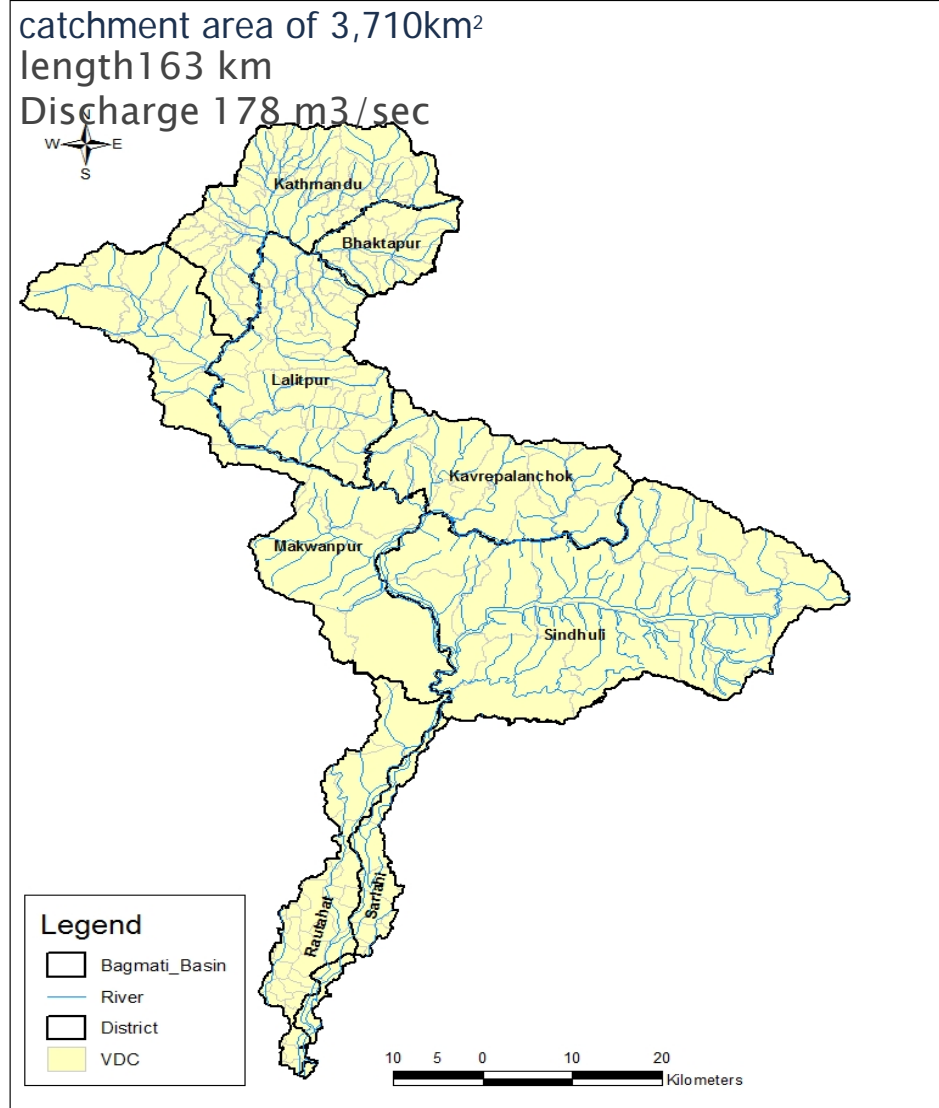


Current Issues on Water Resource management Bagmati River Basin

- Water Scarcity
- Unplanned Urbanization
- Pollution
- Degrading cultural heritage and sites
- River bank encroachment
- Sand mining
- Over extraction of ground water
- Watershed degradation and water induced disaster
- Lack of basin wide Integrated Water Resources Development and Management Master Plan
- Lack of River Basin Organizations

Bagmati River Basin

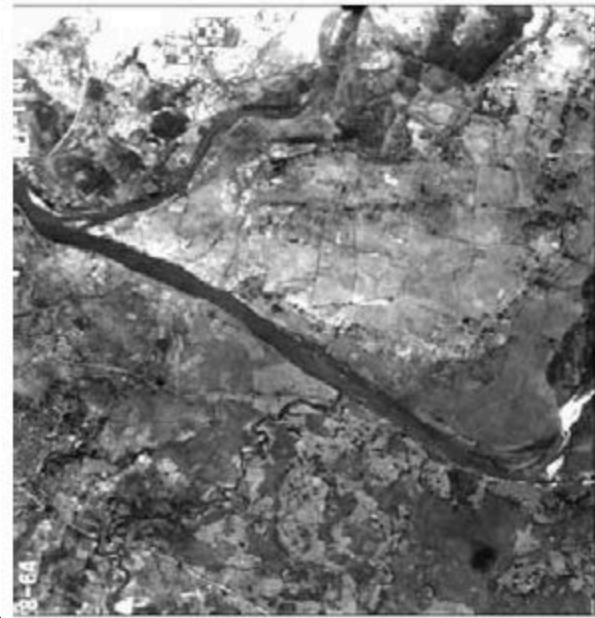
- originating from the north of the Kathmandu valley in the Shivapuri hills and flows to Ganges River .
- It is very important for Nepal strategically, religiously, culturally, economically, socially and environmentally.
- Available water is utilized for water supply, irrigation, hydropower, religious, cultural, industrial and recreational use within the basin.



Key issues and challenges

Upper Reach

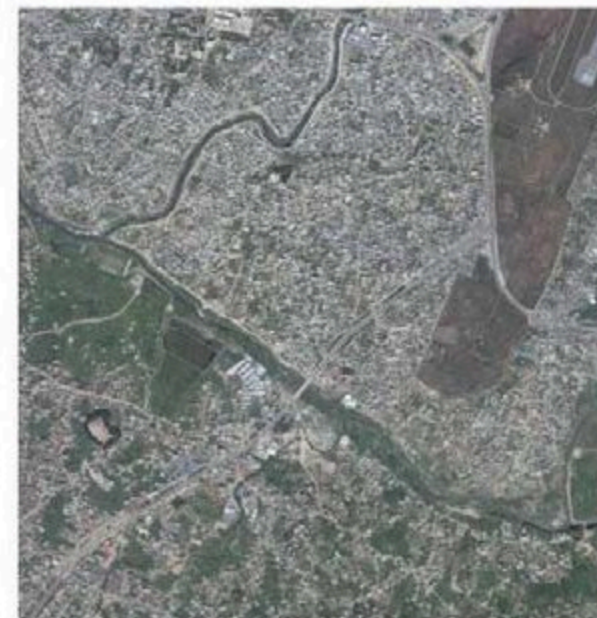
- ▶ **Unplanned haphazard urbanization**
(Migration due to high level of insecurity, lack of job opportunities, health & education facilities)



1964



2001



2007

Key issues and challenges (Cont...)

➤ Pollution



Key issues and challenges (Cont...)

➤ Water Scarcity



Key issues and challenges (Cont...)

- Degrading Cultural and heritage sites



Key issues and challenges (Cont...)

➤ River banks encroachment



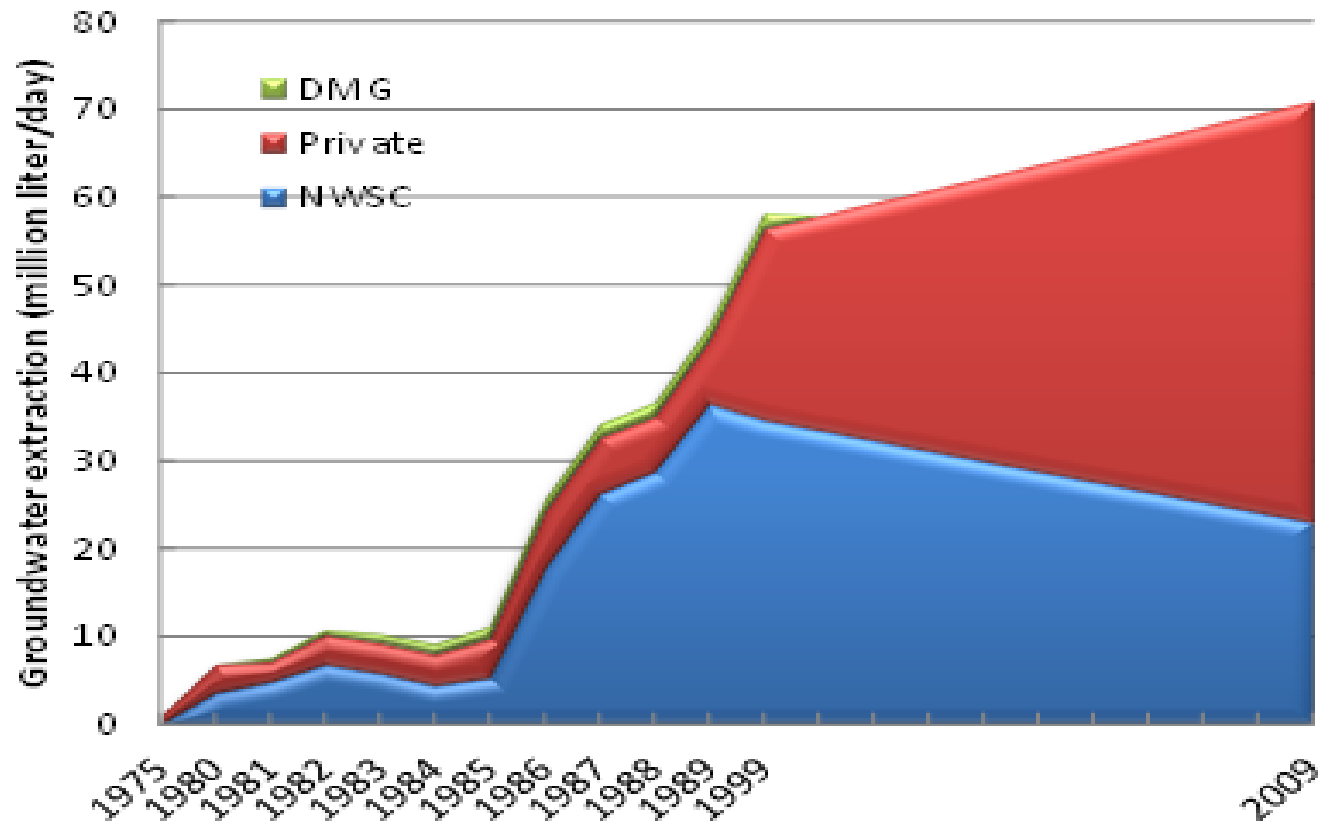
Key issues and challenges (Cont...)

➤ Sand mining



Key issues and challenges (Cont...)

➤ Over extraction of groundwater



Key issues and challenges (Cont...)

Middle and Lower Reach

- Watershed degradation and water induced disasters



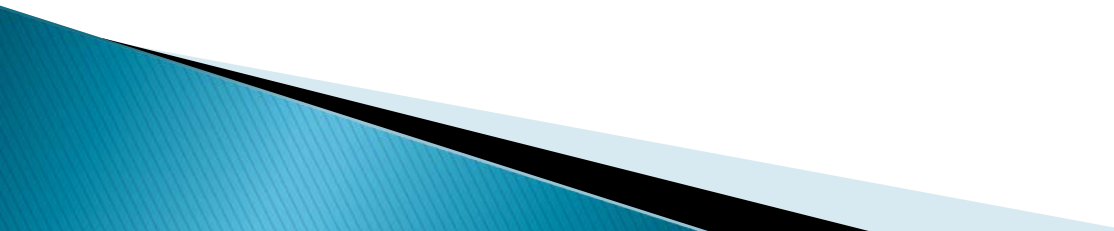
Bagmati during monsoon 1966 AD



Potential Issue in Futures

1. Water availability and quality will be the main issue
2. Federalism and conflict among riparian communities
3. Climate change
 - impacts already seen in Nepal in the form of drought, downstream flooding, intense rainfall, shifting of monsoon period
 - The annual average **precipitation** over Nepal is **decreasing** at the rate of **9.8 mm/decade**
 - The impact on snow and glacier is found to be very high. **Negative trends** are observed in the **glacier mass balance**. Glacial Lakes are expanding and the threats of Glacial lake Outburst Floods (GLOF) are ever increasing.
 - **Maximum temperature** in Nepal is **increasing** at the rate of **0.06 per year** even this is higher in higher Himalaya region

Key for success

1. Committed and strong political will
 2. Adequate institution, resource and legal mandate
 3. Integrated River Basin Master Plan with Clear Vision and implementation Plan
 - International Knowledge and Experience Sharing
 - Capacity building of people associated with basin
- 

Implementing IWRM

- Utilize the opportunities available to meet the challenges
 - Proper implementation of Bagmati River Basin Improvement Project (BRBIP) and Kathmandu Valley Urban Environment Improvement Project (KVUEIP)
 - Preparation of Integrated River Basin Development Master plan (IRBDMP) is the main activity that governs the other sectoral (irrigation, Hydropower, water supply and sanitation) plans. The initiation required is
 - Preparation of IRBMP
 - Institutional Reform
 - Establishment of RBO's (RBO's to provide technical support to basin/Sub basin committee)
 - Policy Reform
 - Preparation of sectoral plan
 - Preparation of implementation plan
 - Preparation of operational Plan
 - **DSS inputs and IWRM implementation with regional Cooperation.**

Implementing IWRM cont.

Asian Development Bank -BRBIP

- **Total project cost 36.0 million US \$**
- Loan 25.5 million , Grant 4.5 & Government 6.0 million US \$
- **WECS component 2.6 million US \$**
- Project implementation Period **2013-2018**

BRBIP Outputs:

1. Systems and capacity for **integrated** and participatory **river basin management established**
2. **River banks** are beautified and **maintained** by **riparian communities** in Upper Bagmati River
3. **Increased Water Availability** in the Basin during the Dry Season
4. **Flood forecasting and early warning system** in the Bagmati River Basin is functional
5. Project is **efficiently managed with effective stakeholder communication**

Implementing IWRM cont

WECS BRBIP Outputs:

1. Systems and capacity for integrated and participatory **river basin management established (WECS component)**
 - 1.1 Legal and Institutional Strengthening for IWRM
 - 1.2 Support for formation of a RBO
 - 1.3 Preparation of IRBDMP
 - 1.4 Establish a Central Water Resources Information System and DSS
 - 1.5 Mobilization and awareness raising of basin

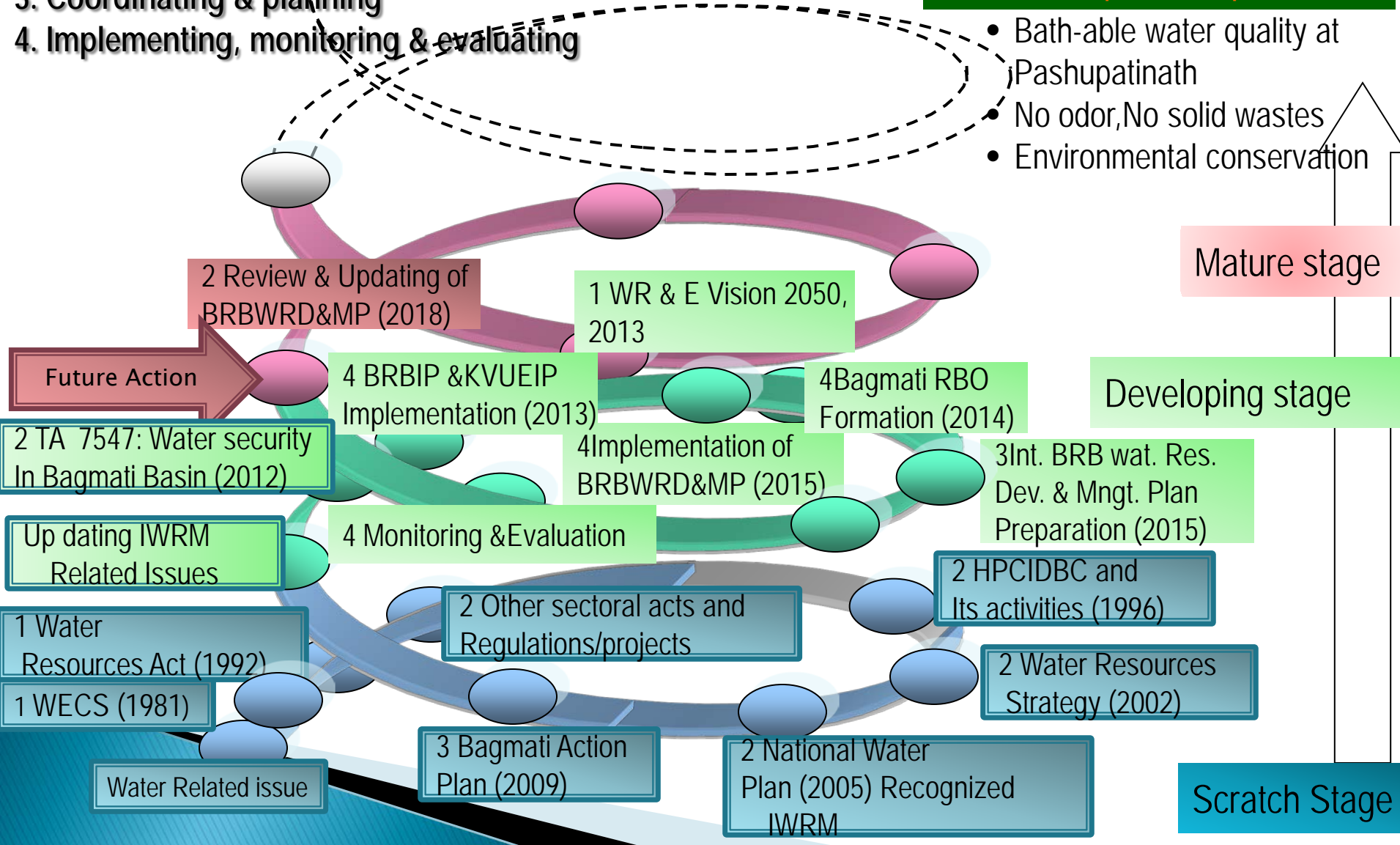
stakeholders; Capacity building and technical training for raising the RBO's competence;

IWRM spiral

1. Recognizing & identifying
2. Conceptualizing
3. Coordinating & planning
4. Implementing, monitoring & evaluating

Guidelines Part2-1 The 'IWRM Spiral' Conceptual Model

- Bath-able water quality at Pashupatinath
- No odor, No solid wastes
- Environmental conservation



Differences in spiral and basin

10/2/2012 Laguna Lake Philippine

Summary of Major Problems

- Poverty and lack of information/education
- Lack of lake-sensitive economic opportunities to expand livelihood opportunities
- Pollution and waste primarily from domestic, commercial, industrial, agricultural sources
- Increased vulnerability of lakeshore settlements to flood hazards, geohazards, climate change impacts and health hazards
- Government indecision over informal sector resettlement
- Unrationalized and unsound siting of infrastructure, utilities, and urban development projects around the lake area
- Unregulated activities in upland areas, watershed, and in the shoreland
- Lack of incentives for lake conservation, watershed protection and restoration



River Warriors



© ABS-CBN Foundation - Jericho Von Muelena



Differences in spiral and basin cont..

10/5/2013 Namngum River Lao PDR

7. Lessons learnt

- Strong political supports from high ranking national and local government officials and their agencies can fasten the procedures of IWRM and IRBM;
- Awareness among key stakeholders on the importance and necessity of the application IWRM in Lao PDR and in its priority river basins can encourage more support and participation;
- Willingness and active participation of different stakeholders in formal NNRBC and grass-root activities are and will be the key for successes on IWRM in the NNRB;
- Valuable technical assistances from international and regional development partners, as well as multi-lateral and bi-lateral technical cooperation with organizations and countries are being

Two forms of Benefit Sharing

- ❑ Transboundary and national-to-local benefit sharing

Types:

- ❑ Monetary – eg revenue sharing
- ❑ Non-monetary – eg resource access
- ❑ Sharing project services – electricity, water
- ❑ Optimizing additional benefits – infrastructure, jobs



Differences in spiral and basin cont..

2/28/2012 Solo river basin Indonesia

- Key issues 6 Ci's project
- High economic growth, leading to:
- Rapid growth of population → urbanization
 - Negative effects:
 - 2.1. Less agricultural land area available;
 - 2.2. Watershed degradation: more erosion, less water retention;
 - 2.3. Higher pollution loads;
 - 2.4. Conflicts between different Water Users
 - 2.5. Increasing Flood Damages





Differences in spiral and basin cont..

11/30/2013 Mahaweli River basin Sri Lanka

E-flow calculation methods

Approach has moved on from min flow (10-15%) to rigorous methods:

- identification of environmental **assets** of a river,
- use of conceptual **flow models** to maintain those assets,

Kala Oya Basin-Harmony with water

(Key for success in the Kala Oya River Basin)
Presented by: Naveen Damithpriya, Civil Engineer

My position and my task
I am a civil engineer in project planning division in the Mahaweli Authority of Sri Lanka. Designing of civil engineering related infrastructures such as dams, canals, roads etc., river basin planning and assessment of project proposals for the Kala Oya Basin are my main duties.

Kala Oya basin

- *3rd Largest river basin in Sri Lanka
- *Extent -2870 sq. Km
- *0.50 million (Approx.) Population
- *8 major reservoirs
- *856 Nos small tanks & cascade tanks

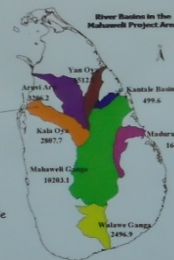




Fig.2 Location of Kala Oya basin

Plans And Solutions

- *Introducing a new institutional and legal frame work
- *Awareness programs
 - Educate the Stakeholders, general public, school Children
- *Introducing low water demand methods for cultivation works
- *Introduction home cultivation methods
- *Apply the bottom to top communication method
- *Better coordination with all stake holders
- *River banks conservation (cultivation bamboo tree on both reach)
- *Conducting free water quality test for public of basin
- *Notice the drinking water quality risk area
- *Promoting rain water harvesting program
- *Promoting environment conservation program

Current issues in the Kala Oya basin

- *Water Scarcity
- *Rapid population growth and urbanization (Pollution)
- *Increasing demand for water
- *Wastages and over use of water
- *Conflicts between upstream & down stream water users (Irrigation, Mahaweli, Agrarian Services etc.)
- *Administration by several institutions (Irrigation, Mahaweli, Agrarian Services etc.)
- *Stakeholder participation in water resources planning
- *Poor land use practice
- *Illegal trapping and damage to irrigation infrastructures
- *Financial constrains for awareness programs
- *Effect of climate change (floods and droughts)
- *Health problems due to pollution of surface water & ground water aquifers
- *Deforestation and sand mining
- *Human elephant conflict

NARBO's Contribution to our basin

- *Sharing the knowledge and experience that is taken from NARBO training programs with colleagues
- *Applying the knowledge taken from NARBO trainings, water duty could be improved for current state

Key for success

- *Good relationship between farmer organizations and irrigation officers
- *Highly experience officers work in water management practice
- *Consultation of all the relevant stakeholders

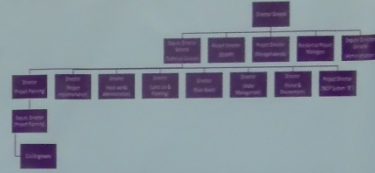


Fig.1 Organization structure (Mahaweli Authority of Sri Lanka)



Water for a food-secure world
www.iwmi.org



Maduruoya Reservoir Project



Thank You For the
Kind Attention



Discussion



Any Questions??

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