NARBO
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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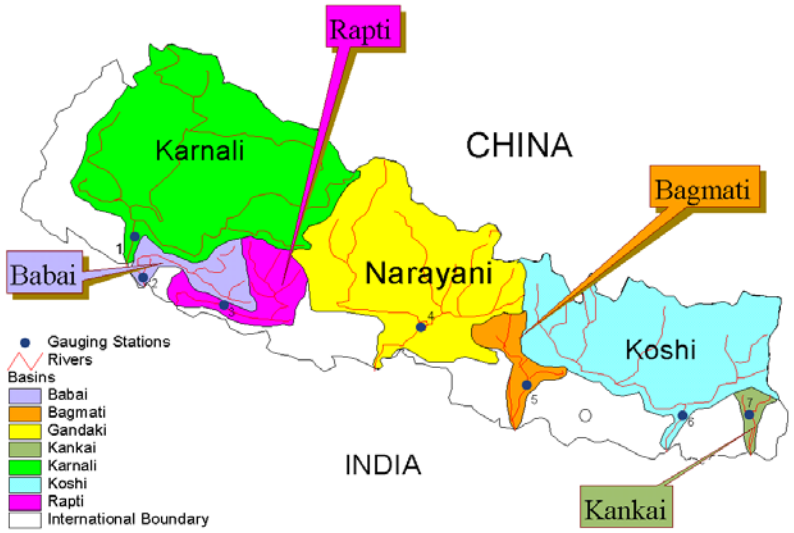
Water and Energy Commission Secretariat , Government of Nepal

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



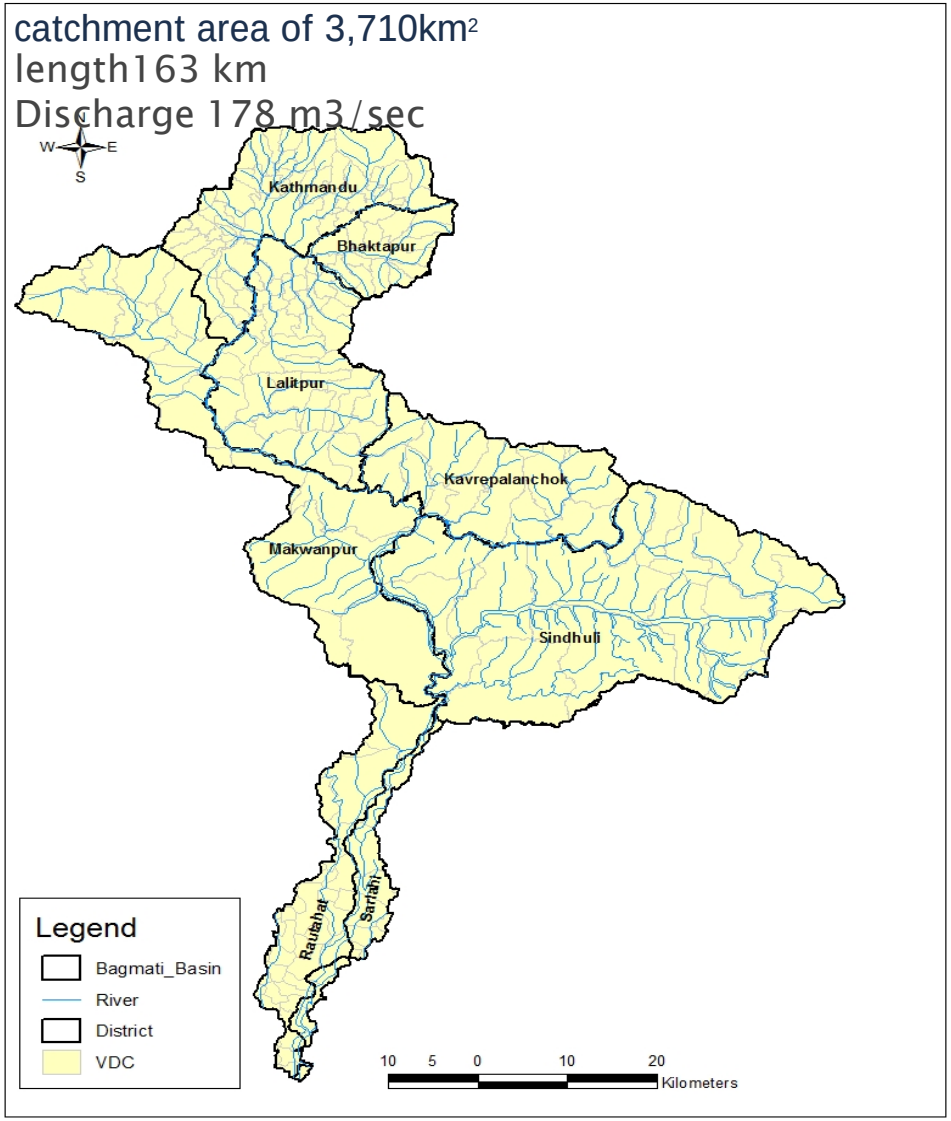
- **Country divided into three physiographic regions**
  - Terai (Plains)
  - Mid-hills
  - High Himalayas
- about **6000 rivers** in Nepal
- **surface water** available in the country is estimated to be about **225 billion m3** annually
- estimated **ice reserve of 481 km3**
- shallow and deep aquifers 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.

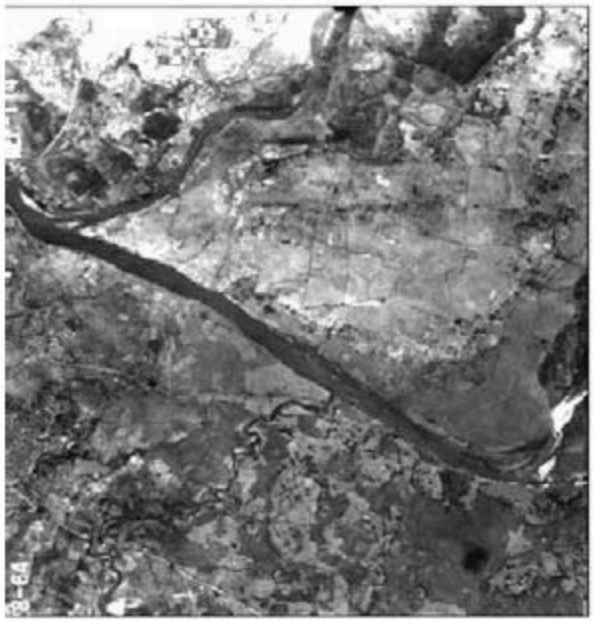


Key issues and challenges

Upper Reach

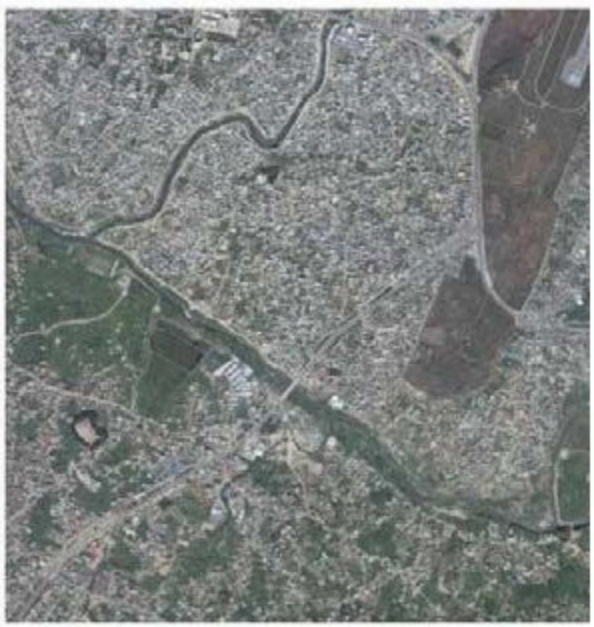
- Unplanned haphazard urbanization

  (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

Live cremations on the Banks of Bagmati River

Key issues and challenges (Cont…)

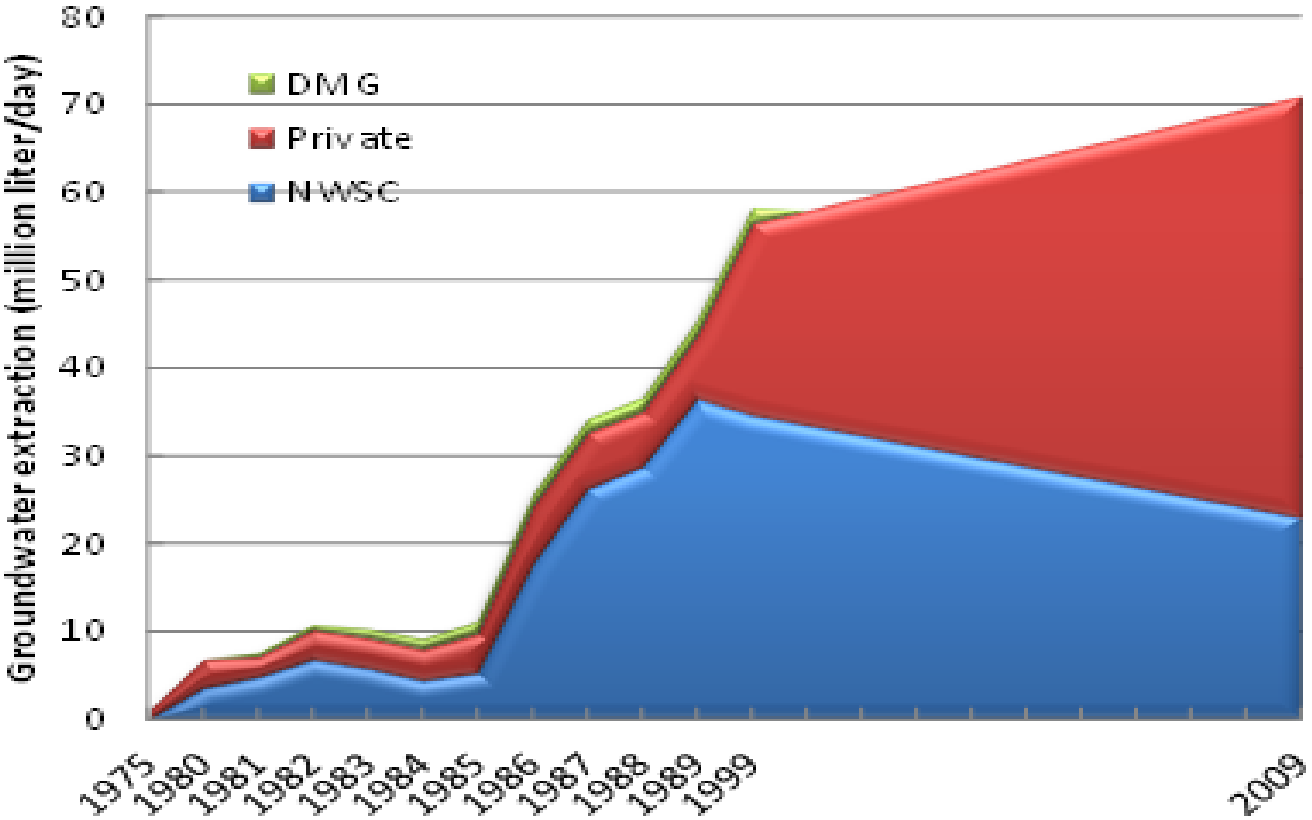
- River banks encroachment

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

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

Source: Water Resources of Nepal in the Context of Climate Change,2011 WECS &WWF

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:

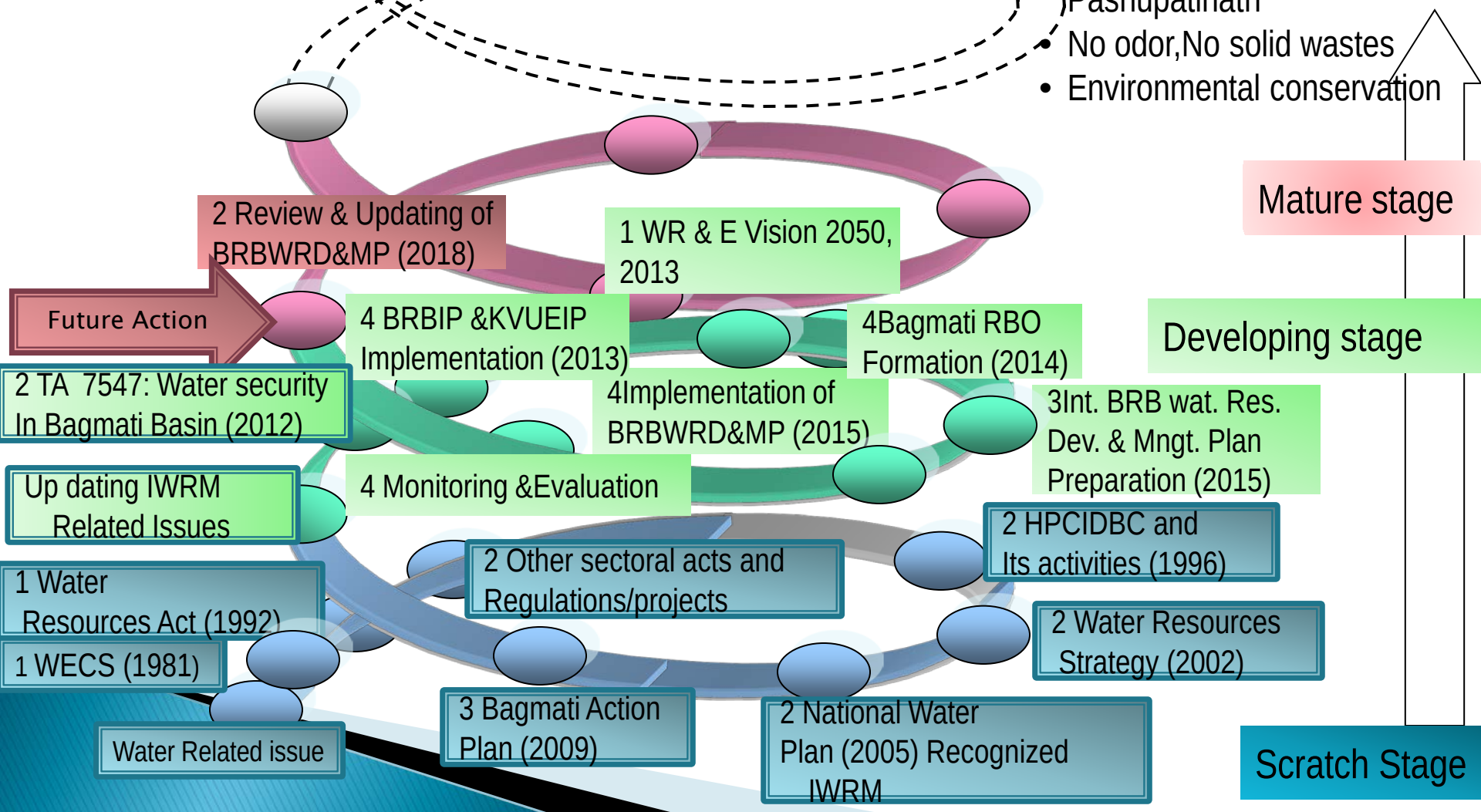
1. Systems and capacity for integrated and participatory **river basin management established (WECS component)**
   - 1.1 Legal and Institutional Strengthening for IWRM
   - 1.2 Support for formation of a RBO
   - 1.3 Preparation of IRBDMP
   - 1.4 Establish a Central Water Resources Information System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



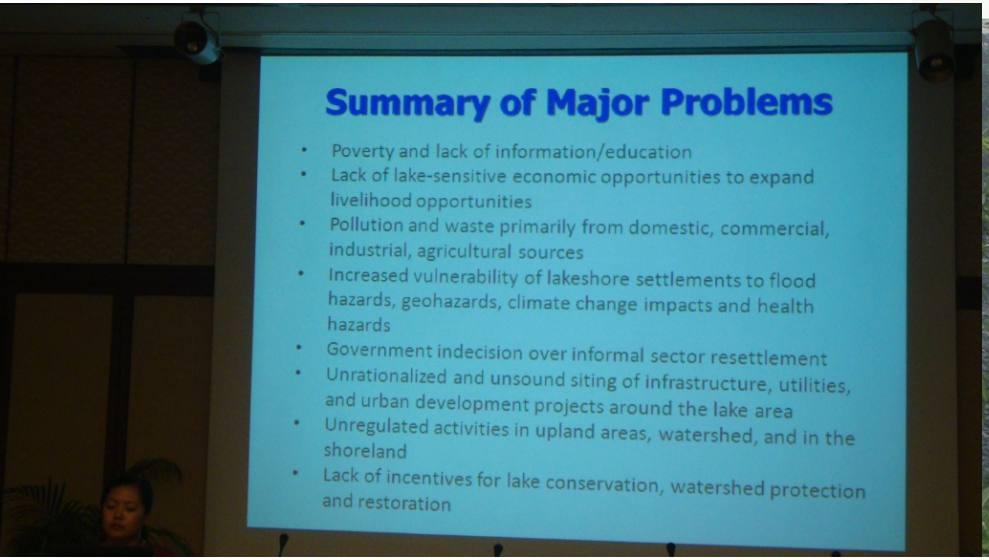
Mature stage

Developing stage

Scratch Stage

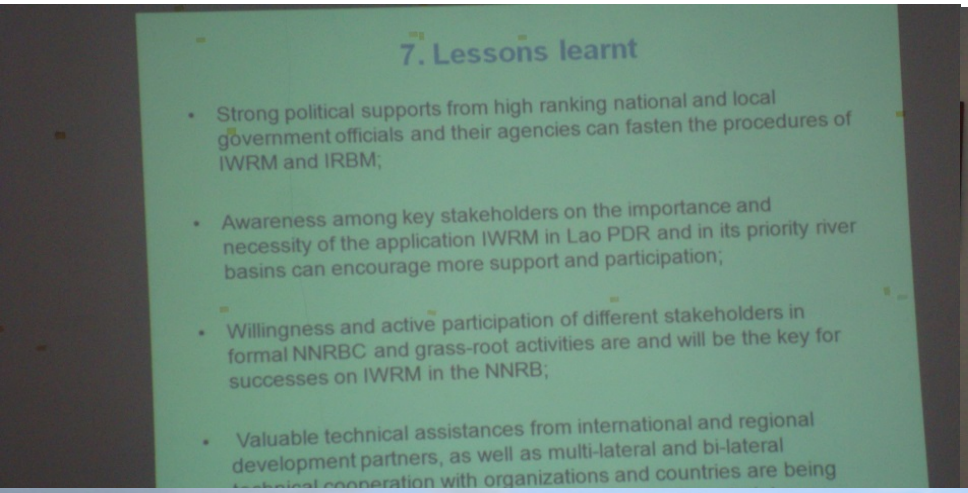
Differences in spiral and basin

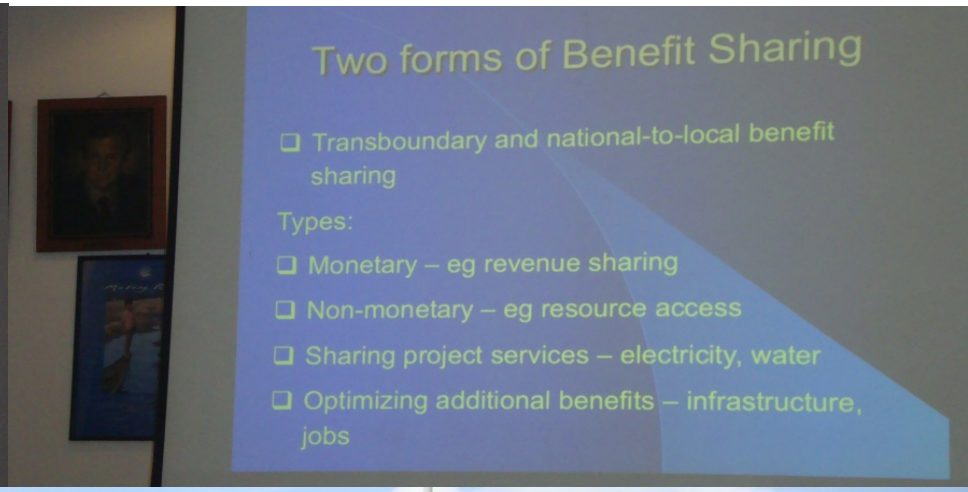
10/2/2012 Laguna Lake Philippine



Differences in spiral and basin cont..

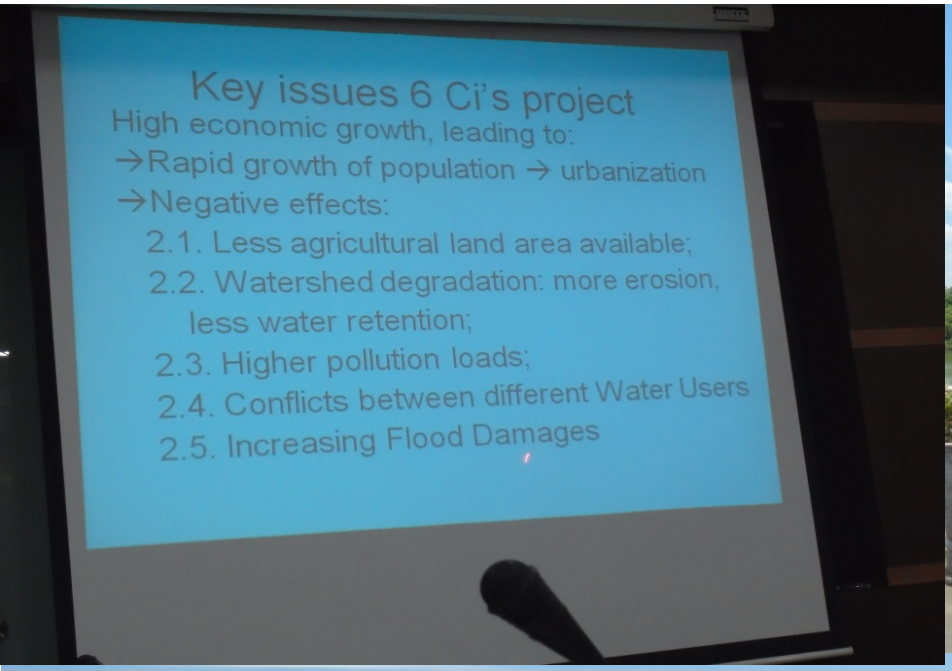
10/5/2013 Namngum River Lao PDR





Differences in spiral and basin cont..

2/28/2012 Solo river basin Indonesia



Differences in spiral and basin cont..

11/30/2013 Mahaweli River basin Sri Lanka

E-flow calculation methods

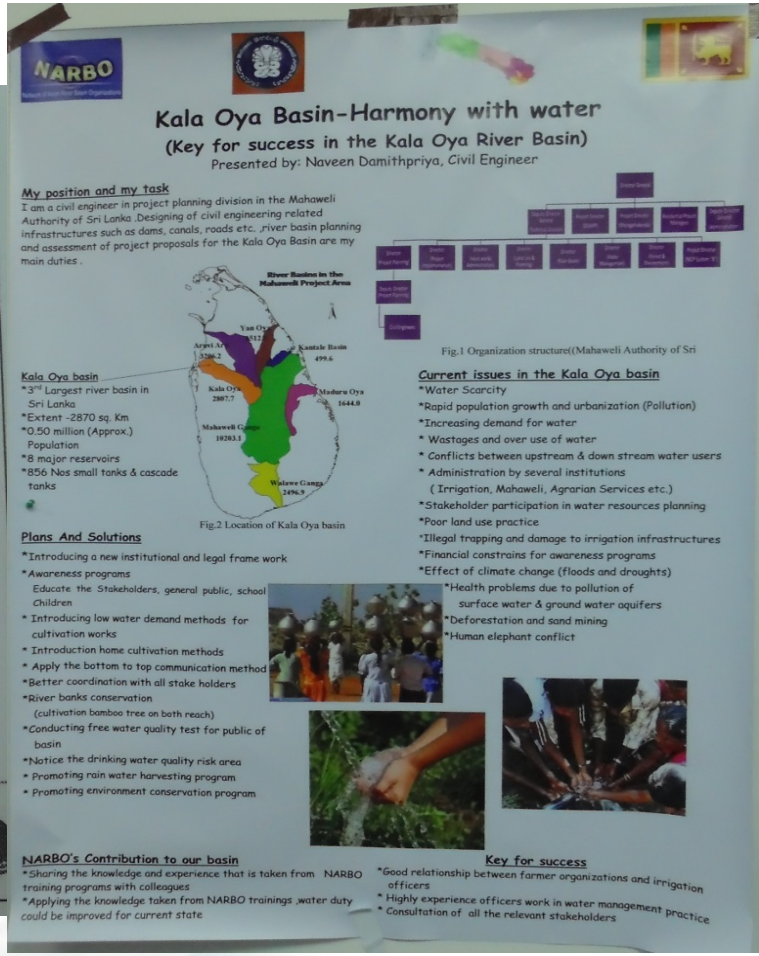
Approach has moved on from min flow (10-15%) to rigorous methods:

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

IWMI International Water Management Institute

Water for a food-secure world

www.iwmi.org



NARBO

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 .

Fig.1 Organization structure((Mahaweli Authority of Sri

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

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
* 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

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

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

Maduruoya Reservoir Project

Thank You For the Kind Attention

Discussion

Any Questions??

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