# NARBO Training Course on RBM / RBO

## 25th – 29th April 2005

# Maha Oya Basin

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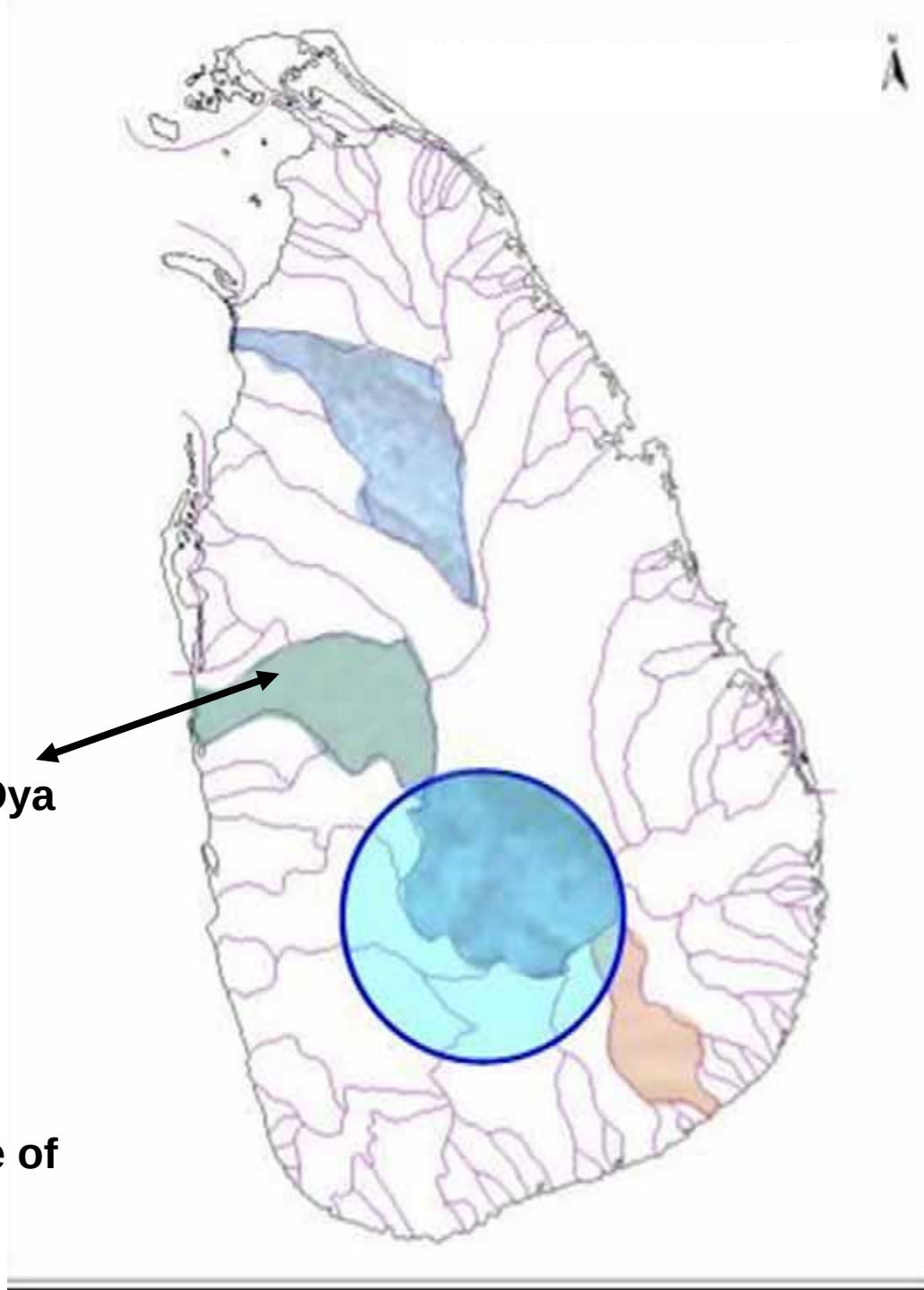
Sri Lanka Water Partnership

# River Basins of Sri Lanka




**Area Water Partnership programme of**

**Sri Lanka Water Partnership**

# Sri Lanka

**Land Area –** 65,610 Sq.Km
Dry Zone : 49,200 Sq. Km
Wet Zone : 16,400 Sq. Km

**Area under water bodies–** 2,900 Sq. Km

**Agricultural Land –** 37,110 Sq. Km

**Area under Irrigation –** 6,000 Sq. Km
Gravity – 5,800 Sq.Km
Lift – 200 Sq. Km

**Area under forests /wildlife reserves –** 2.0 Mha

**Max elevation –** 2,500 M above MSL

**No. of river basins –** 103
(catchment range fm 9 Sq.Km. to 10,327 Sq. Km)

**Longest river –** Mahaweli (335km)

**Climate –** Tropical Monsoonal, Bimodal

**Temperature –** Range 100 – 350 C

**Evapotransiration**
Dry Zone : 1,500mm – 2,000mm
Wet Zone : 1,000mm – 1,700mm

**Rainfall (range) -1,000mm – 5,500mm**
Dry Zone : < 2,000mm
Wet Zone : >2,000mm

**Average mean rainfall** – 1,900mm

**Annual run off** - Dry Zone : 35%
Wet Zone : 60%

**Total annual run off** - 5.0MHM

**Run off to sea -** 3.0 MHM

**Per capita water availability** –2,400M3

**Ground water recharge**
7% to 30% of precipitation

# Water Sector Related Institutions

❖ Ministry of Agriculture, Lands, Irrigation and Livestock

**Agencies**

Irrigation Department (ID)

*Dev and Mgt of Major Irrigation Systems*
*Water Resource Planning/ Development*
*Flood Control*

Irrigation Management Division (IMD)

*Institutional Development in Major Systems*
*Integrated Agricultural production*

Dept. of Agrarian Development (DAD)

*Minor Irrigation*
*Agriculture Support Services and Supplies*

Water Resources Board (WRB)

*Ground Water Mapping, Monitoring and Development*

❖ Ministry of Mahaweli and River Basin Development

**Agencies**

Mahaweli Authority of Sri Lanka (MASL)

*Mahaweli System Management*
*Uda Walawe System Management*

Interim National Water Resources Authority (NWRA)

*Development of National Water Resources Policy and Law*
*Promote IWRM*
*Regulate Water Sector*

❖ Ministry of Urban Development and Water Supply

**Agencies**

National Water Supply and Drainage Board (NWSDB)

*Urban Drinking Water Schemes*
*Rural Water Supply Schemes*

❖ Ministry Environment and Natural Resources

**Agencies**

Central Environmental Authority (CEA)

*Environmental Conservation and Protection*

Forest Department (FD)

*State Forest Development Management and Conservation*

❖ Ministry of Power and Energy

**Agencies**

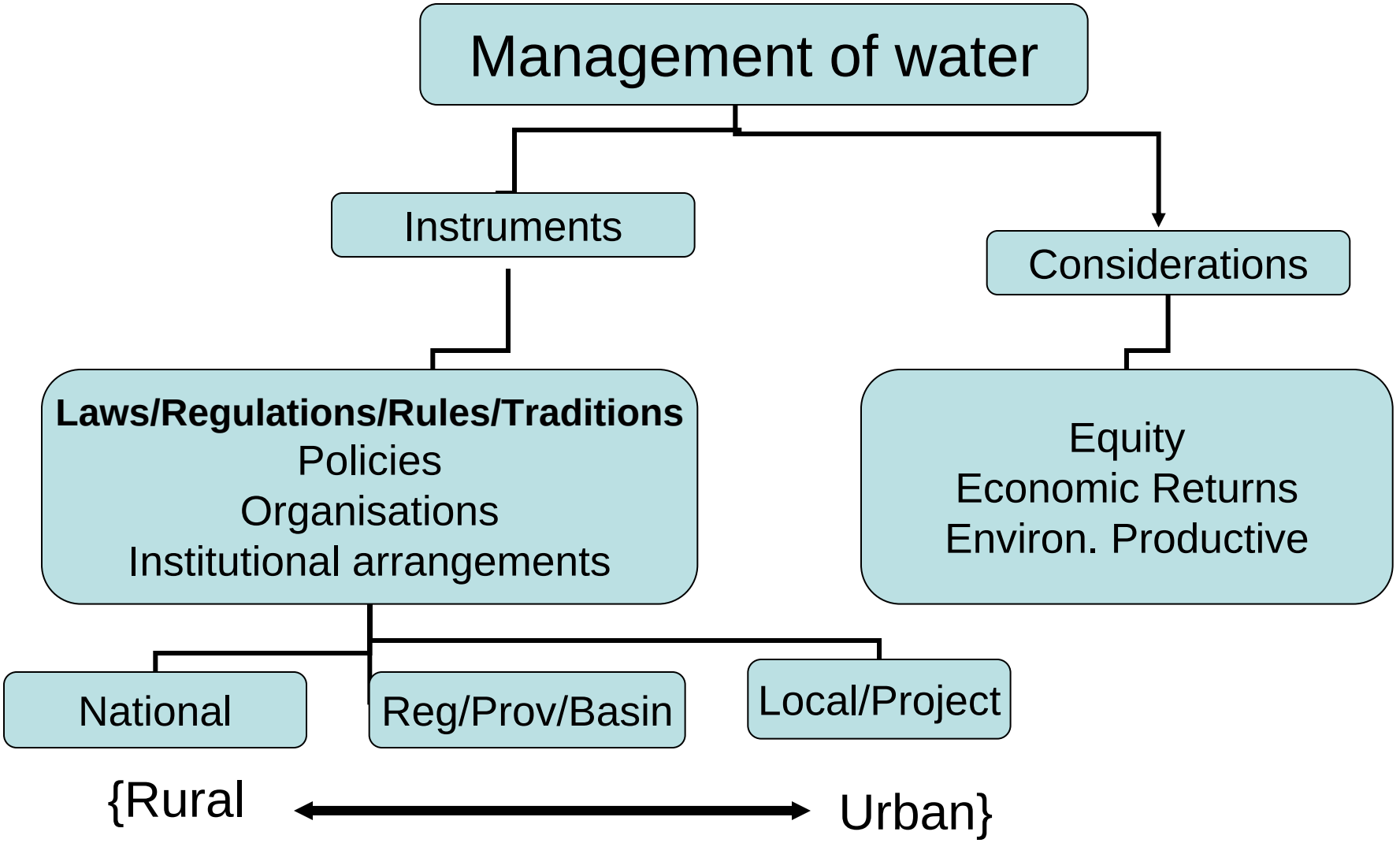
Ceylon Electricity Board ( CEB)

*Hydropower*

❖ Provincial Councils / Local authorities

*Management / Regulation of Provincial Waterways, Irrigation.*
*Provincial Land / Natural resource Management.*
*Waste disposal, health sanitation*.

**50 Acts 40 Agencles deal with water.**



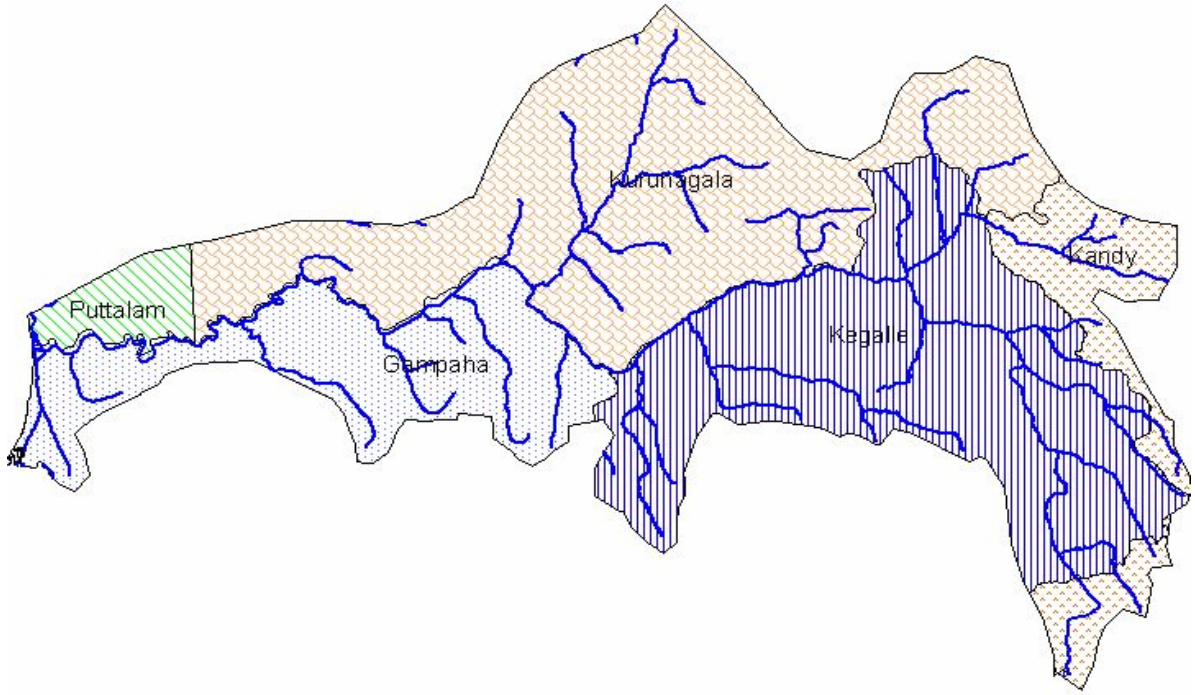

| | | |
|---|---|---|
| **National** | **:** | **CCCIM, SCWSS** |
| **Regional** | **:** | **DCC, DAC, DAC Sub Committee,SDA** |
| **Basin** | **:** | **MASL – Water Panel** |
| **Local/Project** | **:** | **PMC, “Kanna” Meeting AWP** |

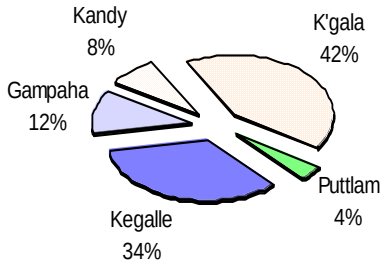
# Existing Institutional Arrangements for Coordination in Water Sector

| | Type | Legally Constituted | Administratively Formed |
|---|---|---|---|
| National Level (Legislative) | Parliament | Parliamentary Consultative Committee | Economic Affairs / infrastructure Sub Committees |
| National Level Policy Implementation | Cross cutting | ____ | a)Development / Secretaries Committee<br>b)Committee Integrating Environment & Development Policy (CIEDP)<br>c)Committee on Environmental Policy Management (CEPOM – for Water) |
| | Sectoral | | a)Central Coordinating Committee on Irrigation Management ( CCCIM )<br>b) National Committee on Water Supply & Sanitation ( NWSS) |
| | Project Based ( Time Bound ) | | a)National Steering Committees for Project Implementation |
| | Special | Cabinet appointed | Task force for pollution mitigation (Kelani/ Maha Oya) |
| Regional / Basin | Cross cutting | | MASL Water Panel |
| Provincial | Cross cutting<br>Cross cutting<br>Sectoral | | a)Provincial Coordinating Committee<br>b)Provincial Environmental Coordinating Committee<br>c)Provincial Coordinating Committee for Water and Sanitation |
| District / Division | Cross cutting | Environment and Law Enforcement Committee | a)District Coordinating Committee(DCC)<br>b)Divisional Coordinating Committee |
| | Sectoral<br>Sectoral | District Agriculture Committee (DAC)<br>Sub Committee of DAC | |
| Major Irrigation Projects | Project based / Sectoral | Project Management Committee ( PMC ) | ____ |

# Maha Oya Basin

Maha Oya is the 3rd largest Basin in Sri Lanka, with a catchment area of 1,528 sq.km and a stream length of 130km. Covers 4 Provinces, 5 Districts and 24 Divisons.




**Districts/ Basin Area Distribution**

# Maha Oya Basin

## Population

1.100,000 (approx. 5.6% of National )

Population density – 710 persons per $km^2$. (National 28.5$km^{2)}$

Population growth 1.3% p.a (National 1.3% )

## Labour Force

400,000 (approx. 6% of National)

## Employment

| | |
|---|---|
| Agriculture | 32% |
| Manufacturing | 21% |
| Construction | 6% |
| Services | 36% |
| Other | 5% |

# LAND USE

## Upper Section

- ✓ Hilly Terrain, High Rainfall
- ✓ Kandyan mixed forest gardens and home gardens
- ✓ small holder tea and rubber plantations (even on steep and >60% slopes)
- ✓ vulnerable to soil erosion

## Middle Section

- ✓ Productive rubber plantations and home gardens
- ✓ Small coconut holdings

## Lower Section

- ✓ Most productive coconut lands, rain fed paddy farming, and home gardens
- ✓ Brick making, sand / Clay mining

# Present Water Extraction and Demand Forecast

| Water Users | Demand Present (1994) (MCM /p.a) | Demand 2005 (MCM/p.a) | Demand 2015 (MCM/p.a) | Demand 2025 (MCM/p.a) |
|---|---|---|---|---|
| **Drinking Water Supply** (Served Population – 200,000)<br>**No. of WSS 14 (pipe borne)**<br>Bambukuliya, Divulapitiya, Dankotuwa, Pannala, Giriulla, Alwwa, Polgahawela, Mawanella , Asupiniella ( Hemmargagama wss), Hiriwadunna, Asupiniella (Aranayaka / Mawanella proposed), Rambukkana, Aranayaka, Kegalle<br>**Present Service Area** (Negombo MC, KIA, KEPZ, Kegalle UC, Mawanella PS, 04 Industrial Parks (Dankotuwa, Makadura, Meerigama & Divulapitiya) | 15.48 | 25.73 | 35.15 | 56.61 |
| **Demand for Industrial Estates**<br>No. of IP 04 (Dankotuwa, Makadura, Mirigama, Divulapitiya ) | 2.83 | 3.11* | 3.42* | 3.76* |
| **Demand for BOI Industries** ( outside the Industrial Parks, 22 BOI registered individual industries) | 1.91 | 2.10* | 2.31* | 2.54* |
| **Demand for Non BOI industries** ( 05 major Non BOI industries & Tile & Bricks Factories ) | 0.10 | 0.11* | 0.12* | 0.13* |
| **Food Production** (Paddy cultivation & mixed crops) | 15.5 | 17.05* | 18.76* | 20.62* |
| **Others** | 5.0 | 5.5* | 6.05* | 6.66* |
| **Total** | **40.82** | **53.60** | **65.81** | **90.32** |

***Note:** Future water demands other than water supply use have been extrapolated on an assumed 10% (provisional) growth rate basis.

# Demand / Supply Situation

| Component | Unit | Present | 2005 | 2015 | 2025 |
|---|---|---|---|---|---|
| **Resources Average Year** | | | | | |
| Total Resources (Average Year) | MCM | 1485 | 1485 | 1485 | 1485 |
| **Dependable Resources** | | | | | |
| Total dependable Resources | MCM | 847 | 847 | 847 | 847 |
| **Water Extraction** | | | | | |
| Irrigation (Paddy Cultivation) | MCM | 36.35 | 36.35 | 36.35 | 36.35 |
| water Supply ( Domestic, Pipe Borne) | MCM | 11.38 | 26.64 | 36.5 | 59 |
| Water Supply (Domestic, Other Sources) | MCM | 15.28 | 15.17 | 16.6 | 25.6 |
| Water Supply (Industrial) | MCM | 4.38 | 5.37 | 17.7 | 24.1 |
| Hydropower | MCM | 0 | # | # | # |
| Trans Basin Exports | MCM | 3.59 | # | # | # |
| Total Extraction | MCM | 70.98 | 83.53 | 107.15 | 145.05 |
| Total Extraction (% of Dependable Resources) | % | 8.38 | 9.86 | 12.65 | 17.13 |
| **Return Flows** | | | | | |
| Total Return Flows | MCM | 38.88 | 47.14 | 61.42 | 81.65 |
| **Consumption Use and Downstream Transfer** | | | | | |
| Consumotive Use | MCM | 32.1 | 36.39 | 45.73 | 63.4 |
| Consumptive Use ( % od Dependable Resources) | % | 3.79 | 4.29 | 5.40 | 7.48 |
| Transfer to Downstream (75% Probability) | MCM | 840 | 811 | 802 | 784 |
| Downstream uses and ecological requirements | MCM | 94.6 | 94.6 | 94.6 | 94.6 |
| Excess Water at Outlet | MCM | 745 | 707 | 707 | 689 |

Low flows less than 5 m3/ s over a period of 12 weeks per annum during dry periods, insufficient to meet domestic / environmental needs.

# Maha Oya Views at Old Mawanella Bridge – Eroded & Polluted River (Actual Situation)

# Eroded Banks

**Sand Mining in Lower Reaches**


# Urban Waste Disposal – Lower Reaches

# Lowered River Bed

**Mechanised Sand Clay Mining**

Thank you