Dependence of Drinking Water On The Water Bodies in Sri Lanka

D.S.D. Jayasiriwardene

National Water Supply & Drainage Board

Contents

- Role of NWSDB
- Domestic Water Sector Coverage & Targets
- National Policy on Drinking Water
- Drinking Water Sources
- Lessons Learned
- The Way Forward
- Dream .....

Role of National Water Supply & Drainage Board

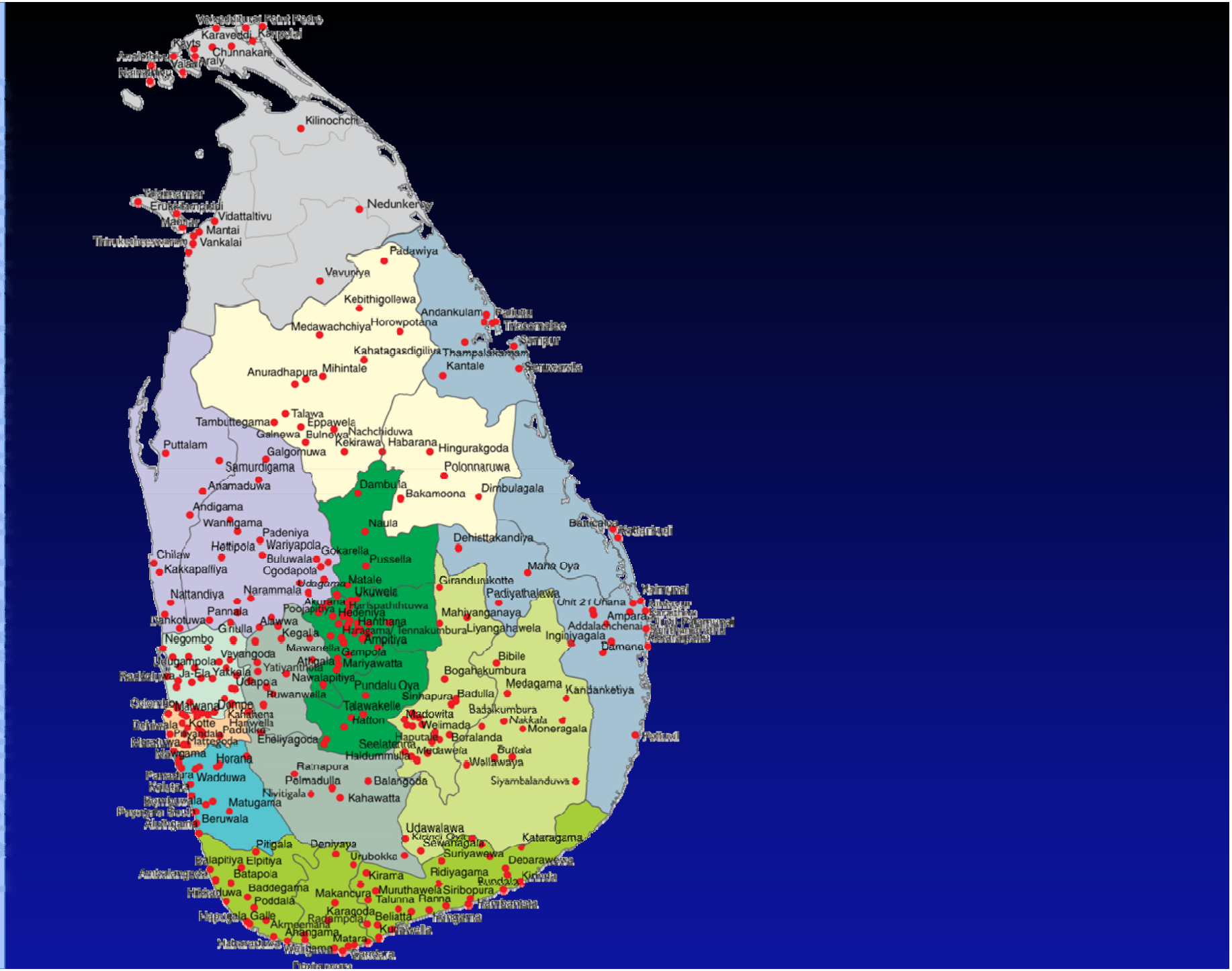
- Operation and maintenance of urban and small town water supply systems and waste water systems

- Project formulation and development
  - Identification
  - Planning and Master Planning
  - Pre-Feasibility & Feasibility Studies

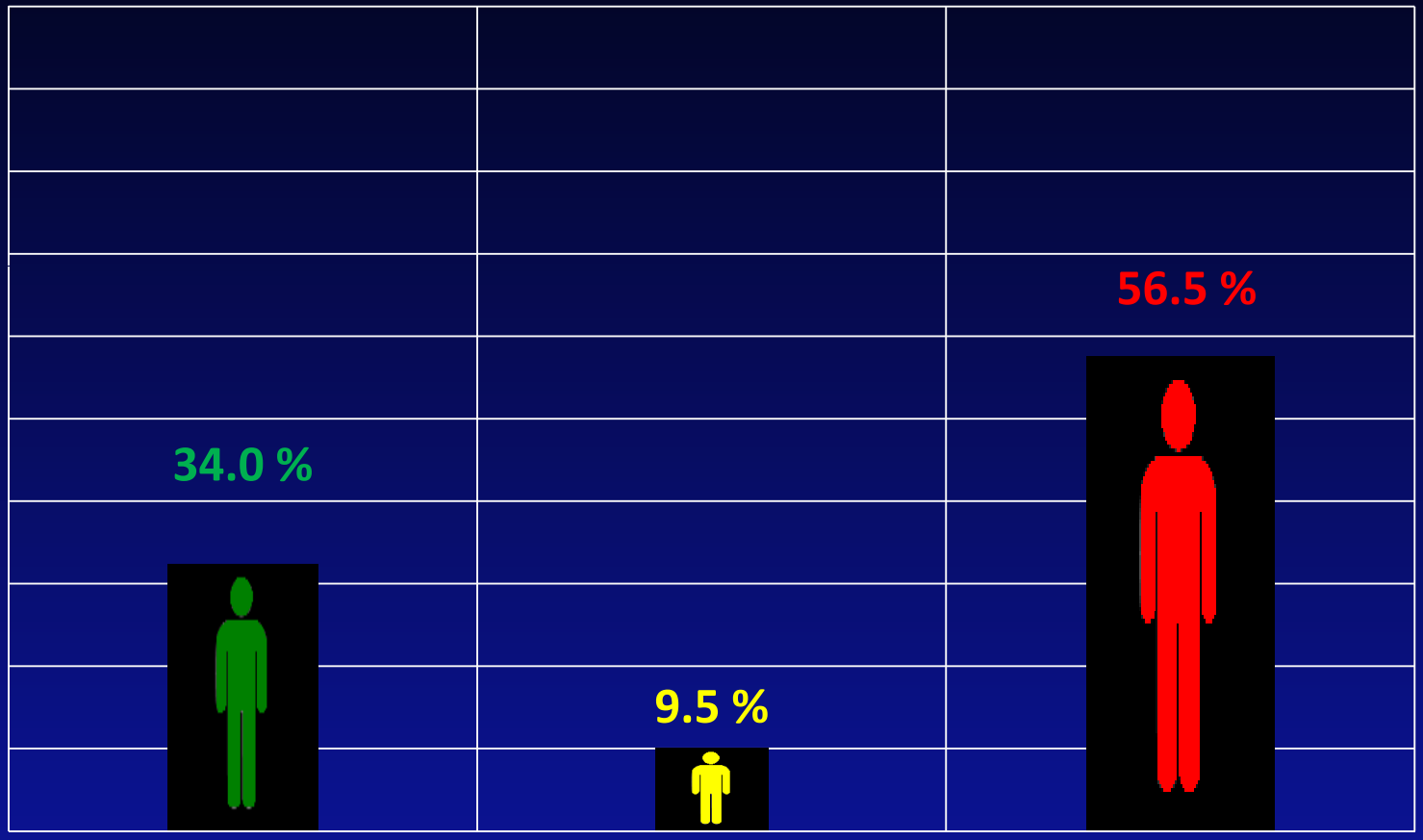
- Execution and implementation of water supply/waste water projects
  - Urban water supply
  - Urban and Industrial waste water
  - Rural water supply and Sanitation

- Providing technical assistance and guidance to Local Authorities and Community Based Organizations (CBOs)

EXISTING WATER SUPPLY SCHEMES

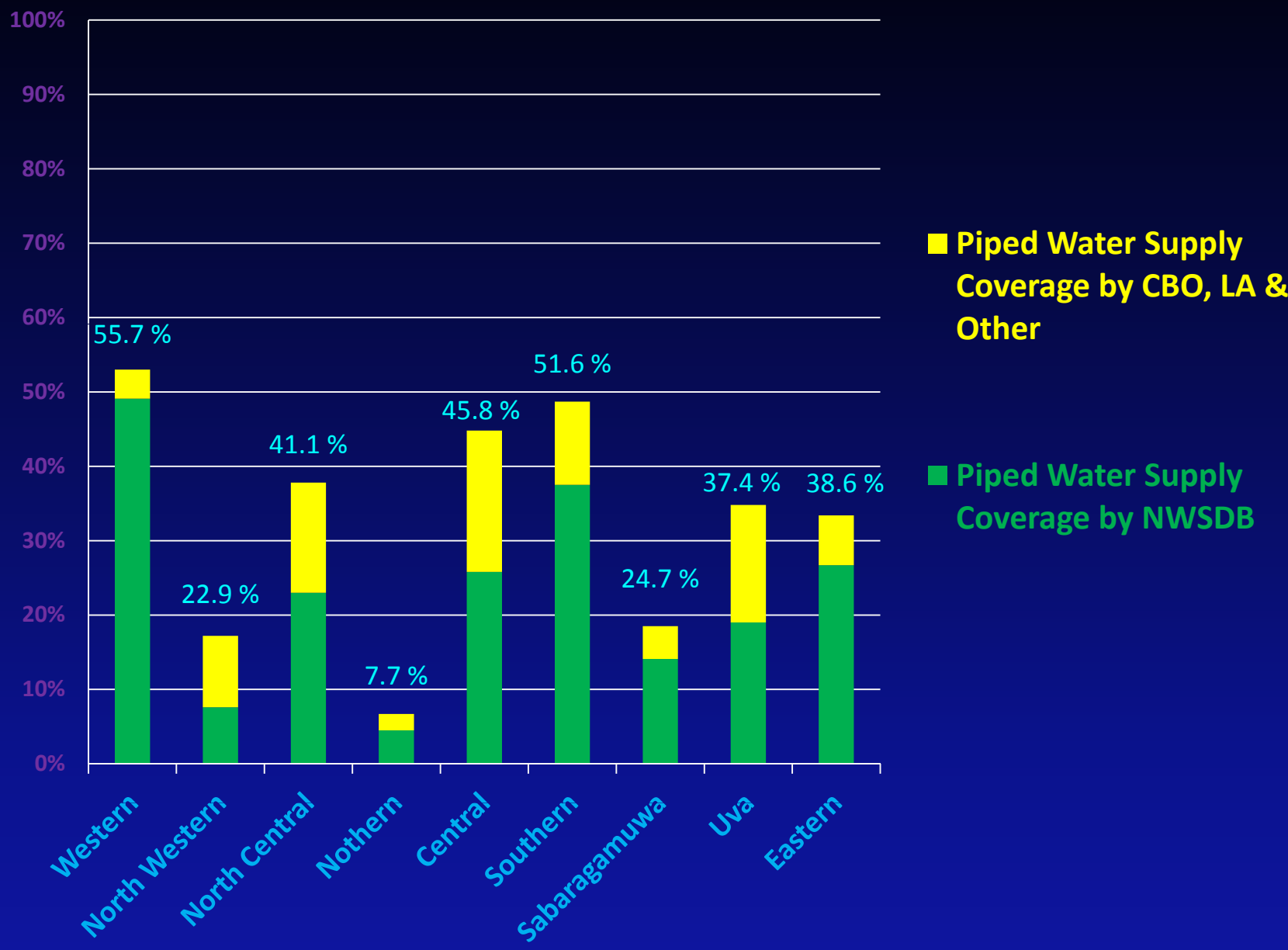


Piped Water Supply Coverage as at December 2012



Piped Water Supply Coverage by NWSDB Water Supply Schemes	Piped Water Supply Coverage by CBOs & Local Authorities	Population not covered by Pipe Borne Water Supply Schemes

Piped Water Supply Coverage in Provinces (December 2012)



Millennium Development Goals (MGDs)

Goal 7

Ensure environmental sustainability

TARGET

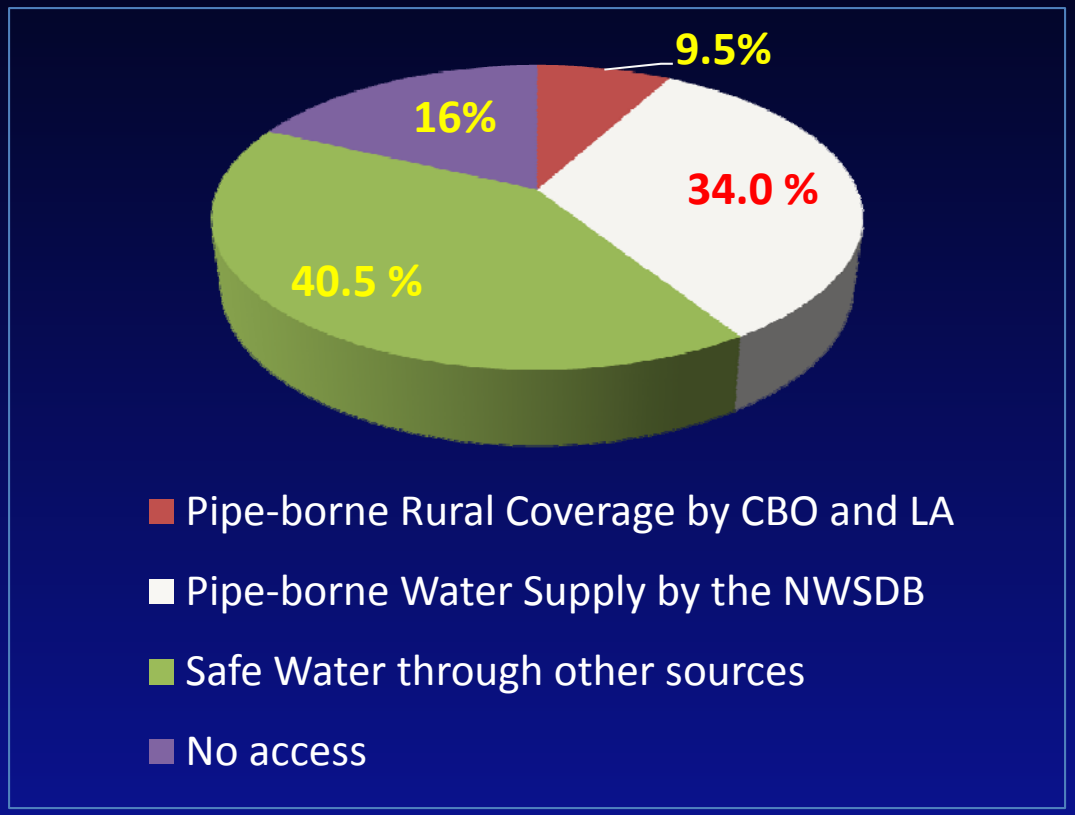
Halve, by 2015, the proportion of the population without sustainable access to safe drinking water and basic sanitation

Safe Water Supply Remains a Challenge in many parts of the world ……including Sri Lanka …….

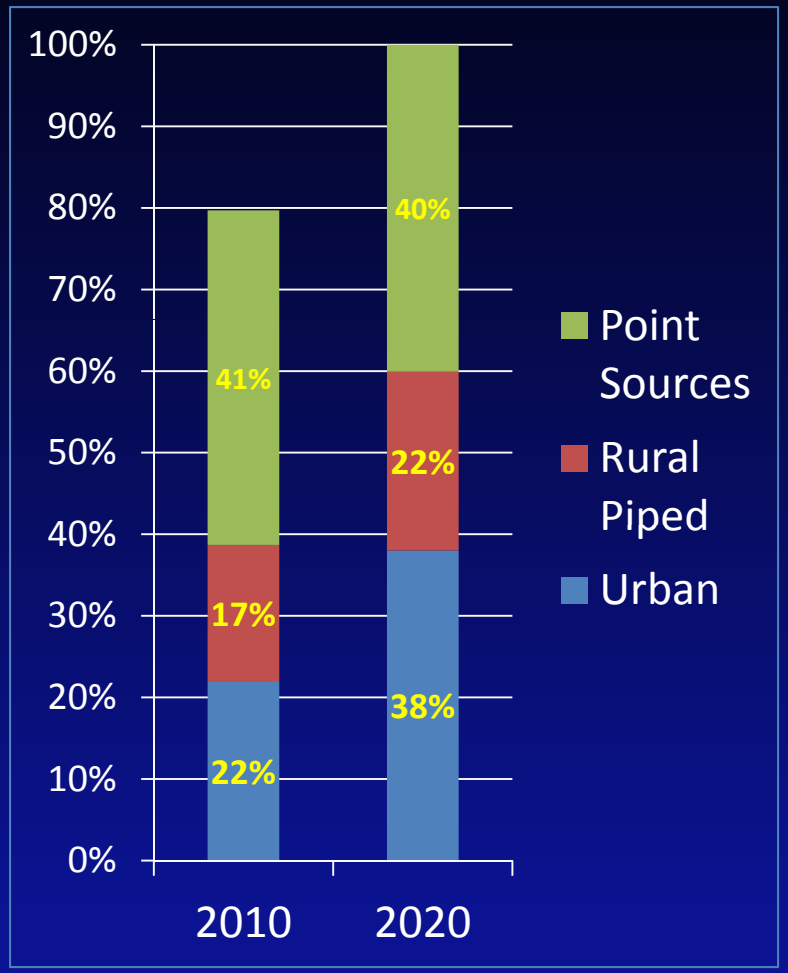
In the future, water quality will need to be considered when setting targets to access to safe water. Despite efforts to compile global and country water quality data, measuring safety of water can be difficult ……

Domestic Water Supply Coverage and Targets

Present Status (End 2012)



Future Targets 2020 Compared with 2010



MDG Target for Safe Water Supply for Sri Lanka in 2015 is 85% and **it is on track**

National Policy on Drinking Water

Goal

The Government of Sri Lanka, while recognizing that access to safe drinking water is a basic right of every citizen, is committed to the provision of adequate quantity of safe drinking water to the entire population at an affordable cost and in an equitable, efficient and sustainable manner.

Drinking Water Sources

- Major Rivers
  - Kelani, Mahaweli, Kalu, Maha Oya Walawe, etc.
- Major Irrigation Tanks
  - Kala Wewa, Parakrama Samudraya, Nuwara Wewa, Chandrika Wewa, Lunugamwehera, etc.
- Irrigation Tanks Improved and Used;
  - Unichchi Tank, Ridiyagama etc.
- Impounding Reservoirs for Drinking Water
  - Labugama, Kalatuwawa, Tampana etc., Basnagoda (Proposed),Yatimahana (Proposed), Wee Oya (Proposed) etc.

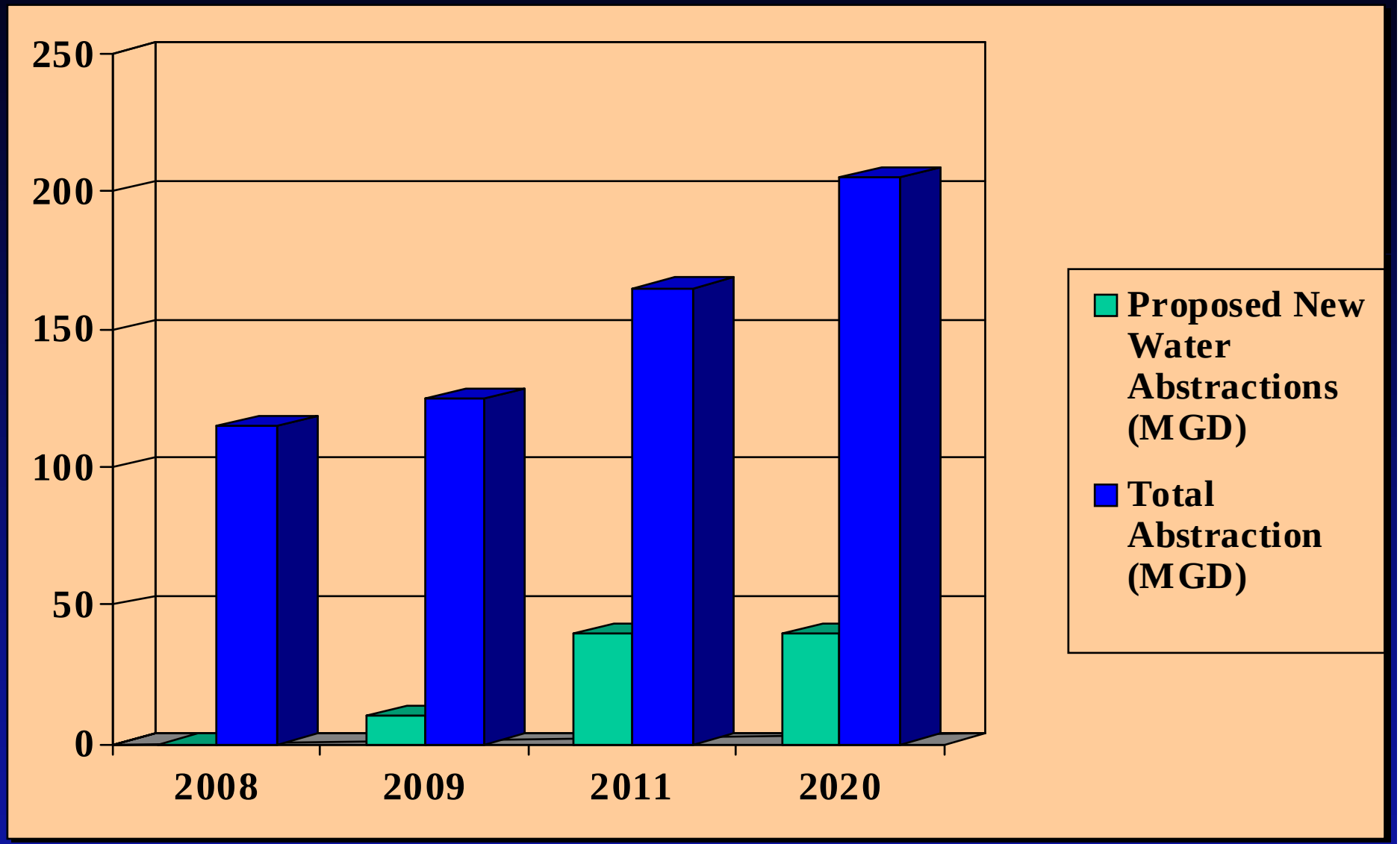
LABUGAMA DAM - BASIC DETAILS

YEAR OF CONSTRUCTION	1886
LOCATION	LABUGAMA
MAXIMUM HEIGHT ABOVE RIVER BED	21.35m
CREST LEVEL	112.26m(MSL)
CREST LENGTH	125m
CREST WIDTH	5.5m
FULL SUPPLY LEVEL	109.52m(MSL)
MINIMUM OPERATING LEVEL	91.2m(MSL)
STORAGE AT FULL SUPPLY LEVEL	89.1 million m^3 ($1960X10^7$ gallon)
SPILL WAY	15.0m LONG
SCOUR	1200mm DIA. PIPE
OUTLET PIPES	500mm DIA.

KALATUWAWA DAM - BASIC DETAILS

YEAR OF CONSTRUCTION	1955
LOCATION	KALATUWAWA
MAXIMUM HEIGHT ABOVE RIVER BED	21.96m
CREST LEVEL	115.49m(MSL)
CREST LENGTH	283m(CONCRETE DAM) 67m(EARTH DAM)
CREST WIDTH	2.44m
FULL SUPPLY LEVEL	112.77m(MSL)
MINIMUM OPERATING LEVEL	95.38m(MSL)
STORAGE AT FULL SUPPLY LEVEL	140.9 million m^3 ($3100X10^7$ gallon)
SPILL WAY	30.5m LONG
SCOUR	1200mm DIA. PIPE
OUTLET PIPES	1200mm DIA.

Abstractions From Kelani Ganga (At Ambatale)

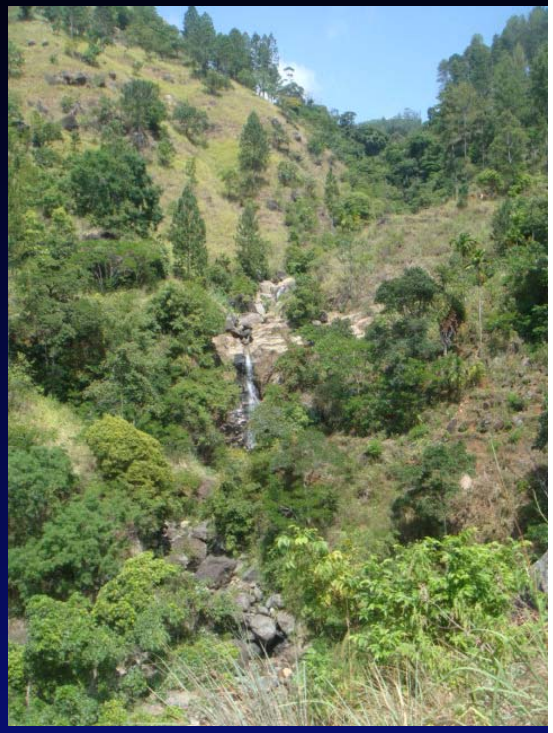


Drinking Water Sources (Contd..)

- New Irrigation Reservoirs/Projects with Allocations for Drinking Water
  - Uma Oya, Kekirioboda, Deduru Oya, Yan Oya etc.
- Tributaries and Streams
  - Bomuru ella, Paradeka, Kirama Oya, etc
- Ground Water (Shallow and Deep)
- Shallow Acquifers
  - Murunkan, kalpitiya, Wallipuram etc. .

Lessons Learned

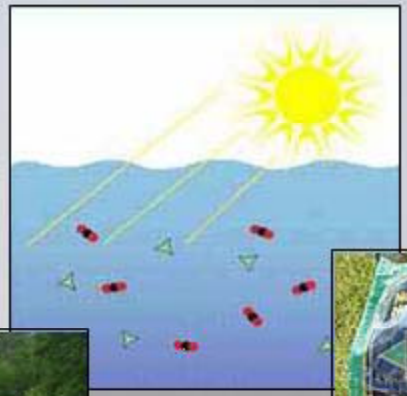
- Competing demands (Irrigation vs. Drinking water, Power, Recreation etc.)- aggravated during droughts.
- Adverse/ extreme environmental conditions and patterns, (Global Warming !) ; Restrictions !!
- Rapid depletion of catchments and watersheds due to human activities Neglected, Unprotected,
- Rapid deterioration of water quality – Algae, Chemicals, Heavy Metals, etc.
- Aggravation of Salinity Intrusion from sand and gem mining



Causes of algal blooms

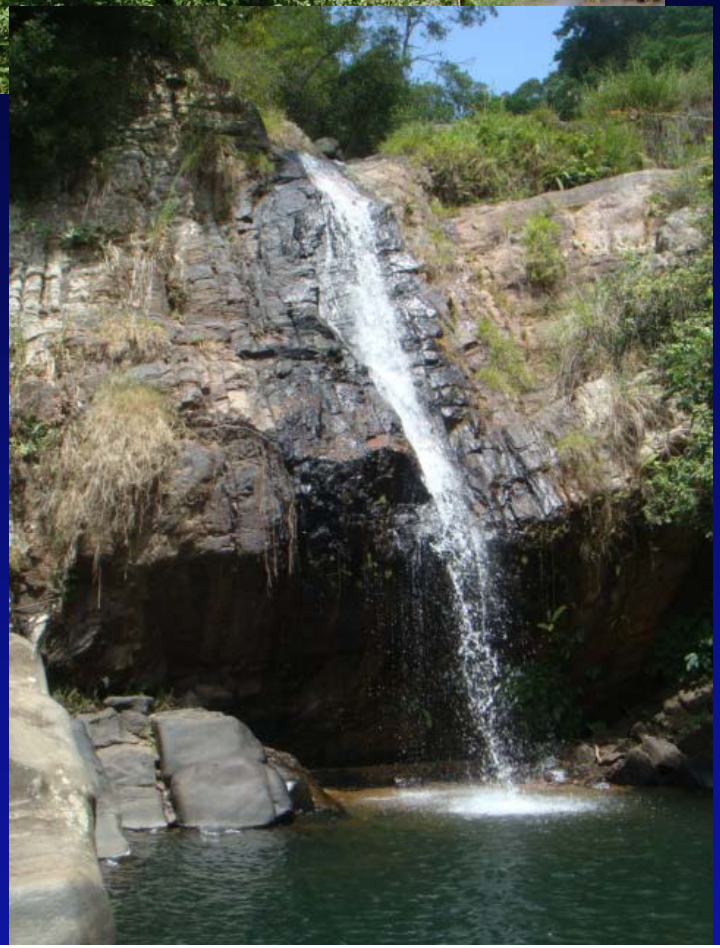
Biomass increases to bloom densities under conditions favorable to growth

- Sunlight (light penetration)
- Temperature – to start growth
- Nutrients – not so simple
  - High P; High N
  - Nostocales Can Fix N
    Low N:P Ratios
- Wind
  - Calm, low turbulence
  - Most have gas-filled vesicles to compensate
- Modified Hydrology
  - Resuspension of Nutrient-rich Bottom Sediment
  - Flushing vs Retention Times



Lessons Learned

- Fragmented water resource management from Conflicts between authorities and duplication of responsibilities
- Overuse of chemical fertilizers and pesticides
- Haphazard discharge/ disposal of toxic industrial waste, human waste and solid waste to water bodies
- Lapses in Regional, urban and land use planning.
- Emerging water related chronic diseases. (Eg. CKDu, Cancers ???)



The Way forward

- Integrated Water Resources Management
- Improving waste disposal systems and regulations
- Strengthening environmental Acts/ Regulations and Local Authority capacities/ legislations
- Improved physical planning
- Launching of catchment/watershed protection programs
- Promoting Water Reuse and Recycling
- Construction of salinity barriers and upstream reservoirs

The Way Forward (Contd..)

- Ensuring minimum environmental flows
- Maintaining dedicated reservoirs for extreme events
- Improving waste disposal systems for domestic wastes, industrial wastes and solid waste dump leachate.
- Per capita demand reassessment and management
- Promoting alternate sources except for drinking and cooking

Long Term Scenario – The Dream

- Water Quantity Ensured;
  - Catchments Preserved & Natural Forests Flourished – Latest plant technology interlinked with indigenous knowledge and latest technology for mapping, monitoring, mitigation etc., Carbon Trading ??
- Water Quality Improved;
  - Sources protected – Scientifically controlled sand/gem mining, environmentally friendly waste discharge treatment, solid wastes recycled & value added.
  - Nanotechnology/biotechnology used for water & wastewater treatment and optimized organic farming
  - Highly sophisticated natural pest & weed control
  - Latest technology (satellites!) for quality monitoring & early warnings

Long Term Scenario – The Dream (Contd.)

- Water managed efficiently;
  - Policy for priority/sharing during crisis & due to climate change simulated with real time technology.
  - Highly water efficient Plant technology
  - Water saving and re-using technologies for all users
- Institutional
  - Joint efforts between all stakeholders
  - R & D Programs collaborated between Universities, industry & sector institutions.

THANK YOU