

Integrated System for Multi-Usage Reservoir Management in Sri Lanka

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Mahaweli Authority
of Sri Lanka

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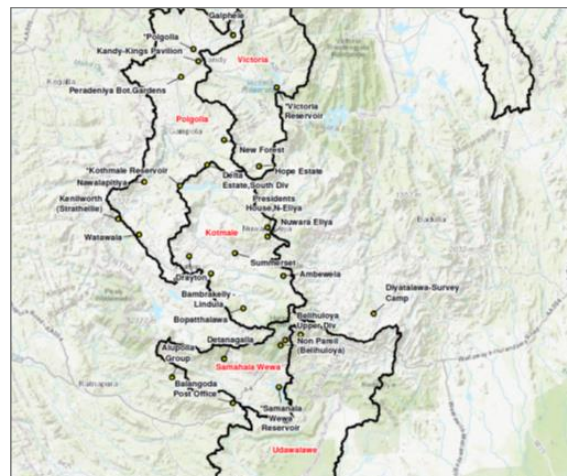
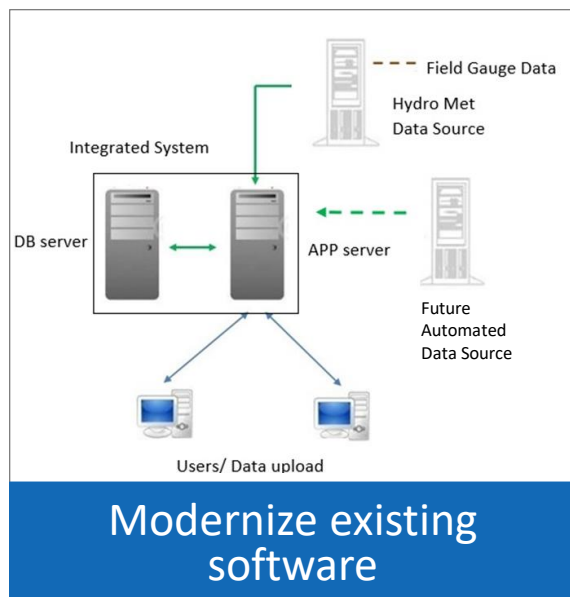


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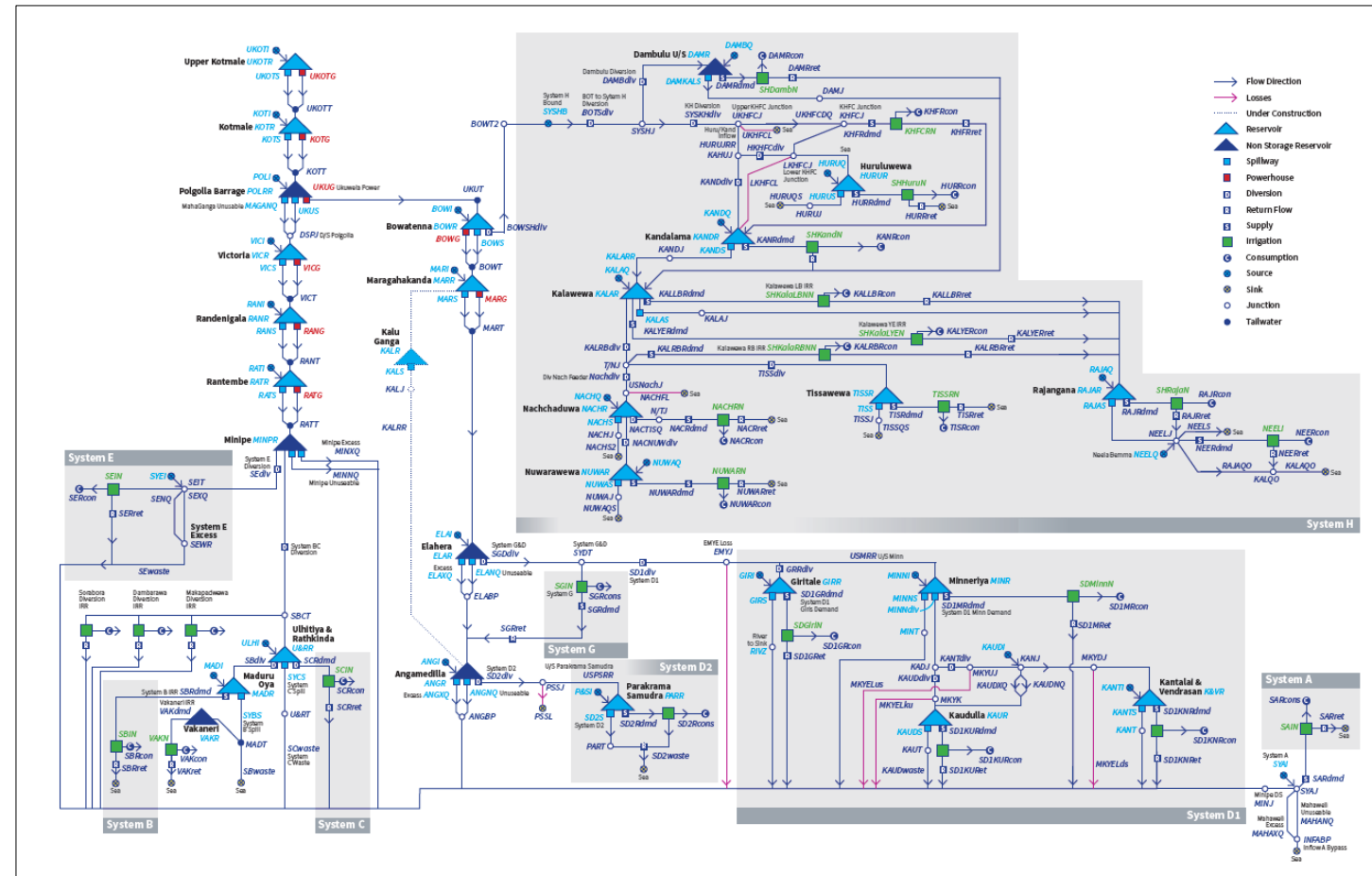
Project Objectives

Working with the Mahaweli Authority of Sri Lanka to...



Mahaweli Authority of Sri Lanka (MASL) Overview

- Jurisdiction includes:
 - 5 rivers
 - 15 major hydro plants
 - 32 irrigation areas
 - Multiple canals and diversions
- Over 3000 years of water management for irrigation
- Requires complex operation & planning



Multi-Use Reservoir Management in Sri Lanka

OBJECTIVES



CHALLENGES

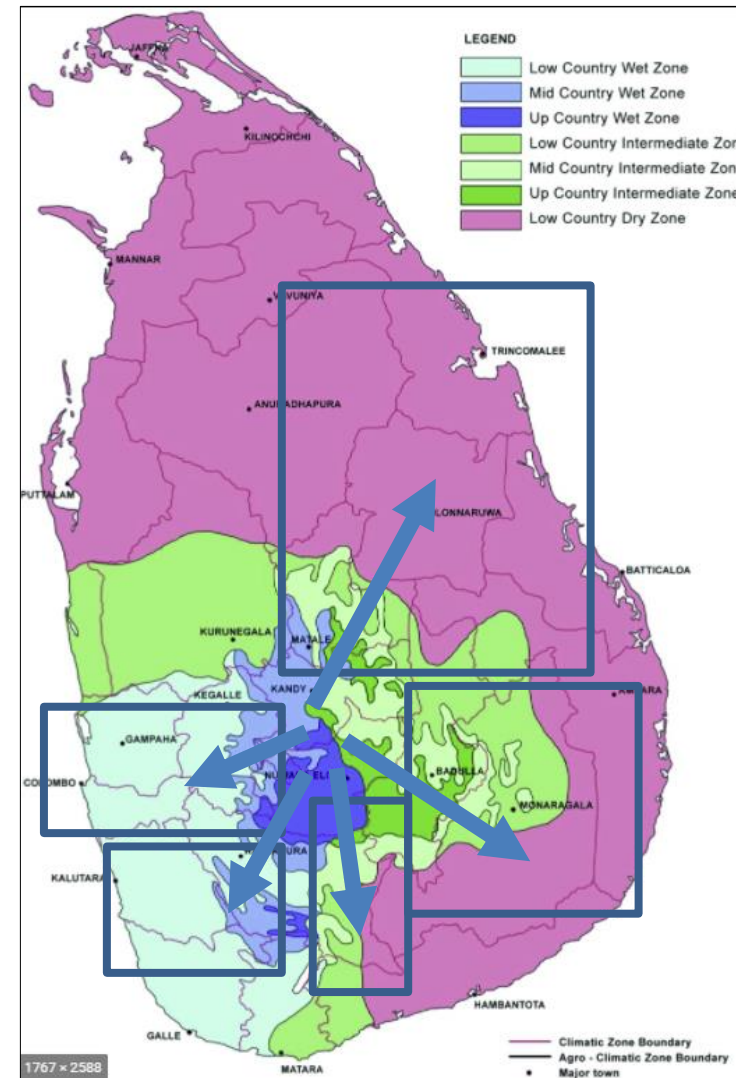
- Multiple stakeholders
- Changing conditions due to:
 - Economic development
 - Demographics/Urbanization
 - Climate change





Crop	Water needed/season (m)
Rice	1.0 - 1.5 m
Soybeans	0.3-0.5 m
Sugar Cane	1.5 -2.5 m (year)

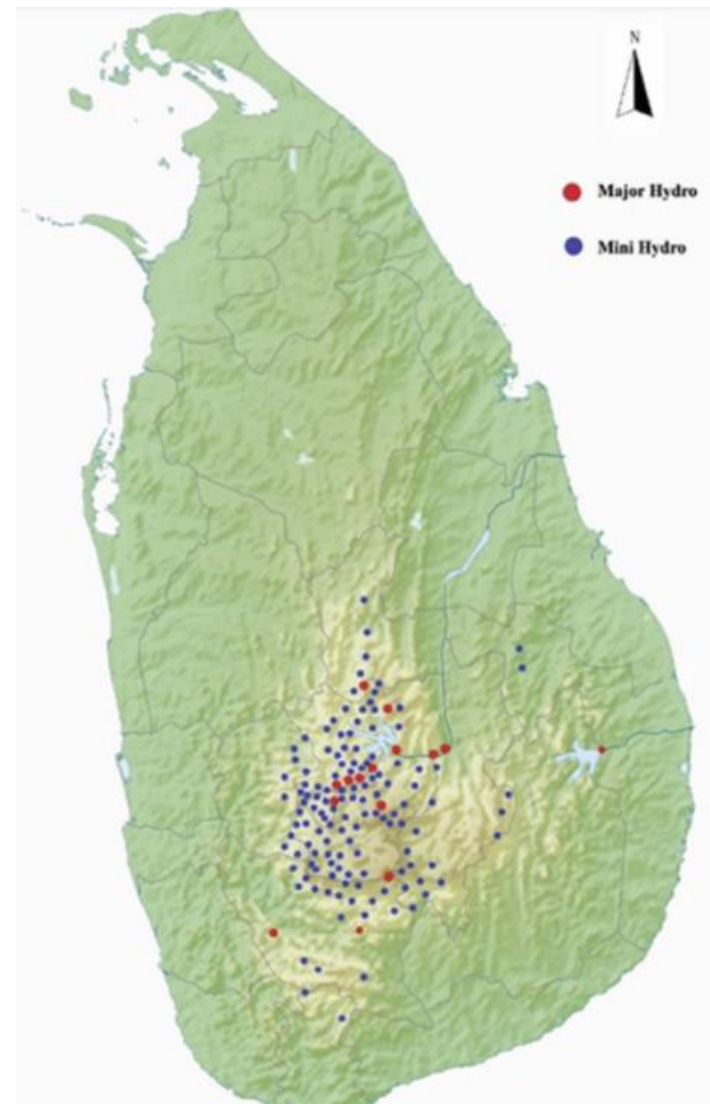
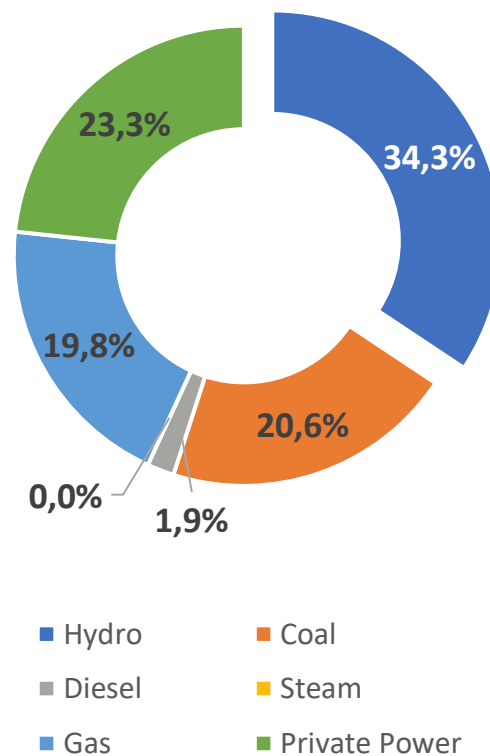
- Rice paddies (40% of all crops)
- Non-paddy crops
- Water re-distribution to diverse areas
- Management of water allocation/ reliability of supply





- Significant contribution: 30-50%
- Peaking capability

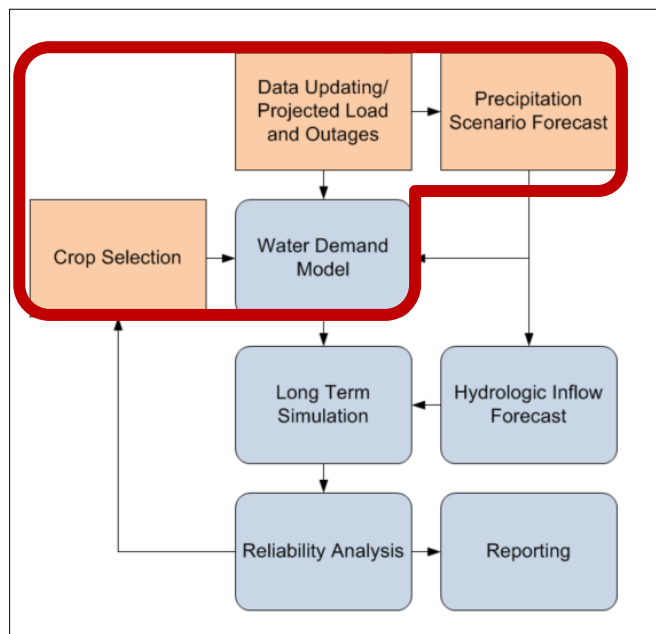
Calculated Energy Mix by Long-Term Planning Model in average MW



Integrated System for Multi-Usage Reservoir Management

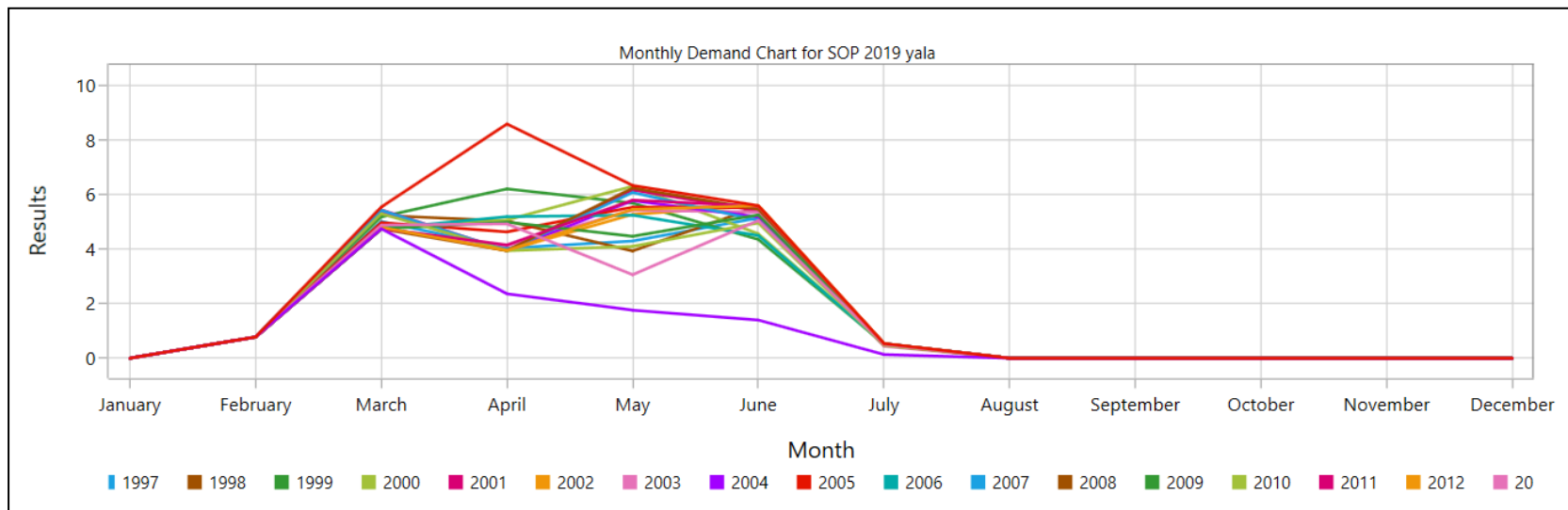


Water Demand Model Calculates Irrigation Demand Forecast

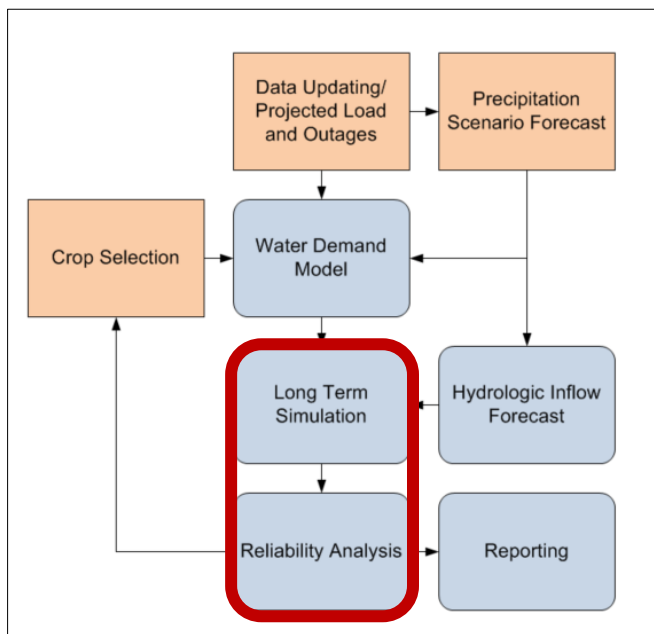


- Water demand forecast/irrigation area
- 2 crops/ year

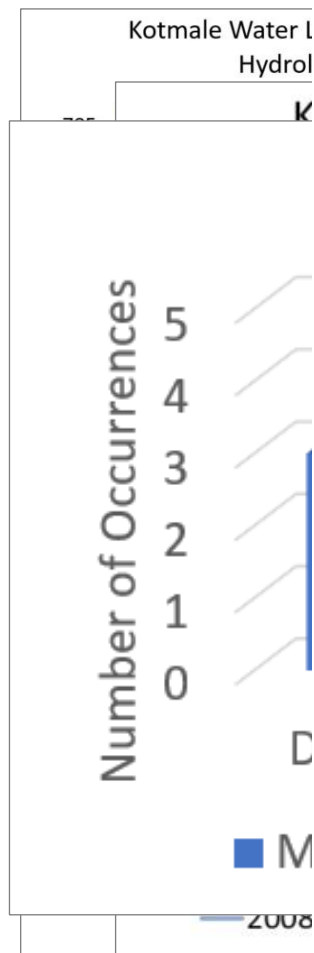
Season plan: Irrigation Demand Forecast



Simulation of Water Availability/Reliability Analysis



- Time series analysis
- Reliability criteria
- Interactive use for crop selection



System	Irrigation Area	Deficit 5%	Deficit 10%	Deficit 20%
Mahaweli	System G	0	0	0
	System D1 Min	1	0	0
	System D1 Kaud	1	0	0
	System D1 Kant	1	0	0
	System D1 Gir	0	0	1
	System C	0	1	0
	System E	0	0	1
	System A	0	0	0
	System B	0	0	1
	Vakaneri	0	0	0
Sub Total		3	1	2
Walawewa	Kaltota	0	0	1
	Udelawewa RB	0	0	1
	Udelawewa LB	1	0	0
	Lynagosta RB	0	0	0
	Lynagosta LB	0	0	0
Sub Total		1	0	2
System H	KHFC	1	0	0
	Kandalama	2	0	0
	Dambulu	0	0	0
	Kelawewa LB	0	0	0
	Kelawewa RB	0	0	0
	Kelawewa YE	0	0	0
	Rajagana	0	0	1
	Neela Bemma	0	0	0
	Nuwar	0	0	0
	Nachchaduwa	0	0	0
	Tissawewa	0	0	1
	Hurudulawewa	0	0	1
System	Grand Total	2	0	3

Deficit 5%	Deficit 10%	Deficit 20%
0	0	0

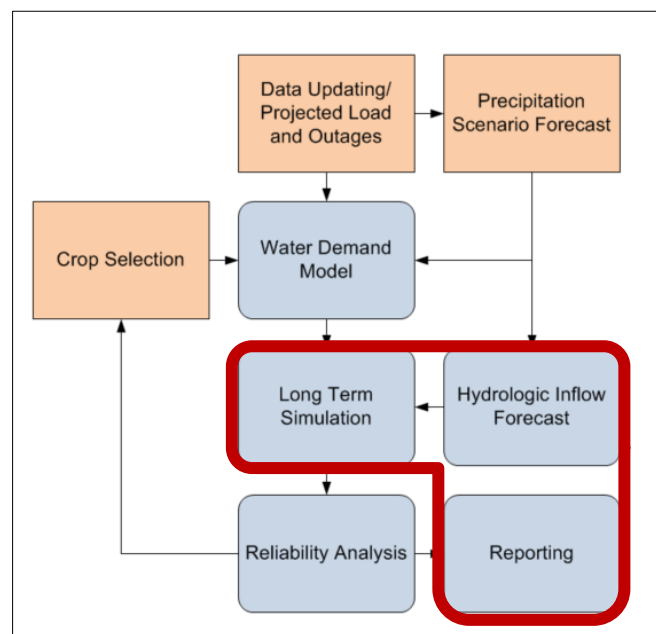


t 20%

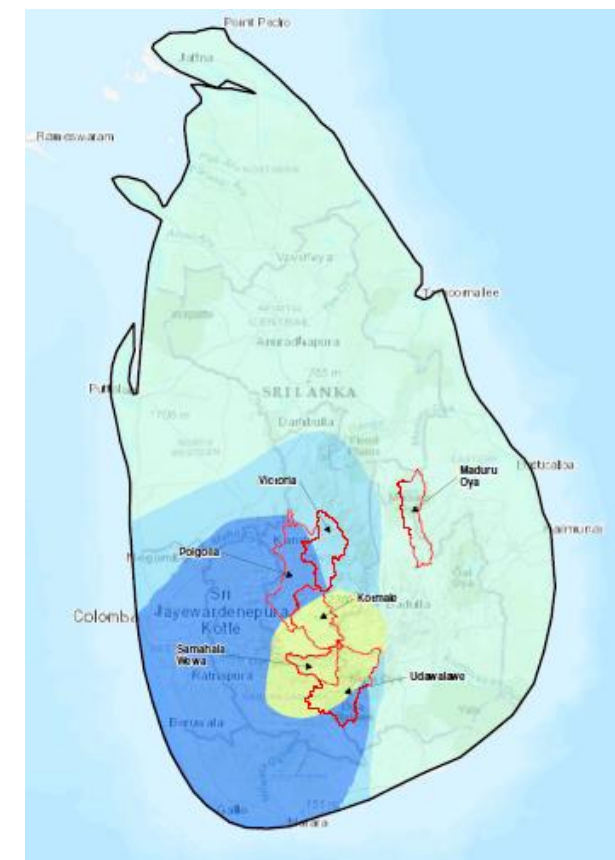
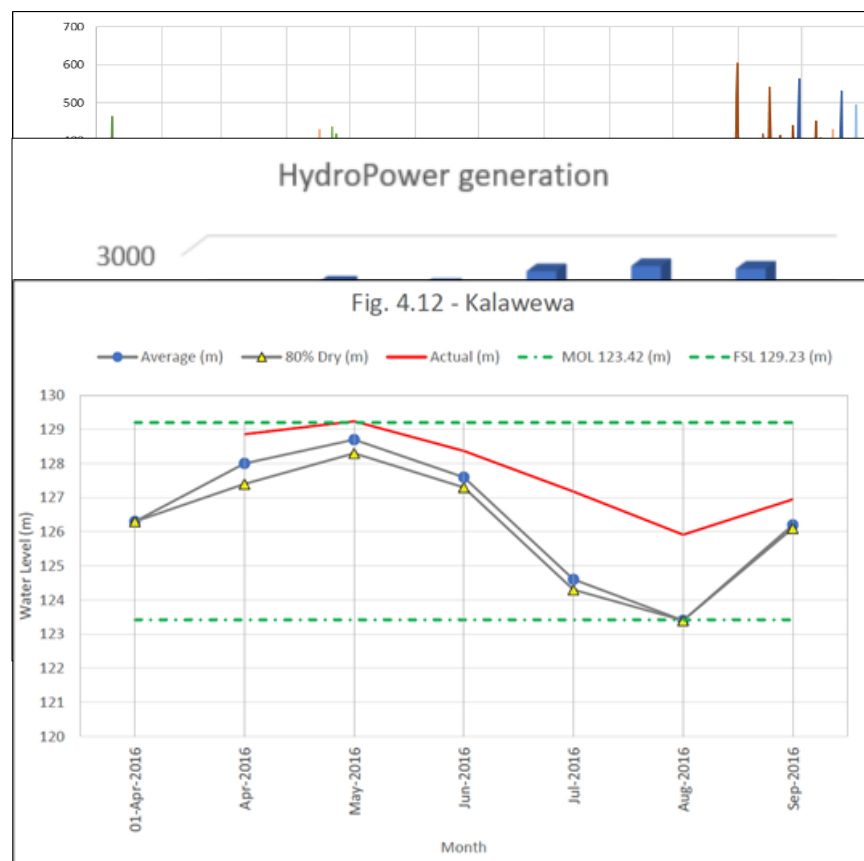
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Arrive at a Water Plan Using the Short and Long-term Forecast

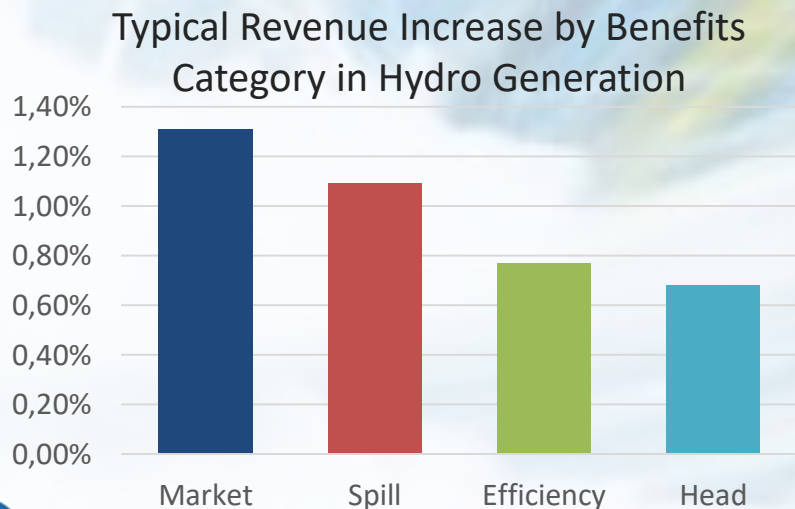


- Natural flow time series
- Projected reservoir storage
- Projected Hydro generation



Benefits of Vista DSS Implementation

- Potential for increased reliability
- More optimal hydro operation
 - Previous implementations, savings of 1-5% can be achieved
- Empower decision makers with the right data/information



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