

Country Report - GEOSS/AWCI demonstration projects

SRI LANKA

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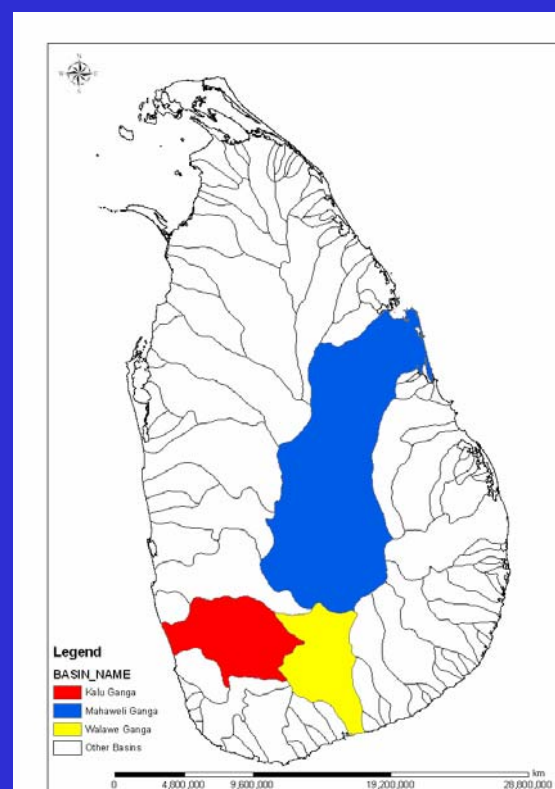
The 3rd GEOSS Asian Water Cycle Symposium
Beppu, Japan, 2-4 November 2007

Issues in three basins

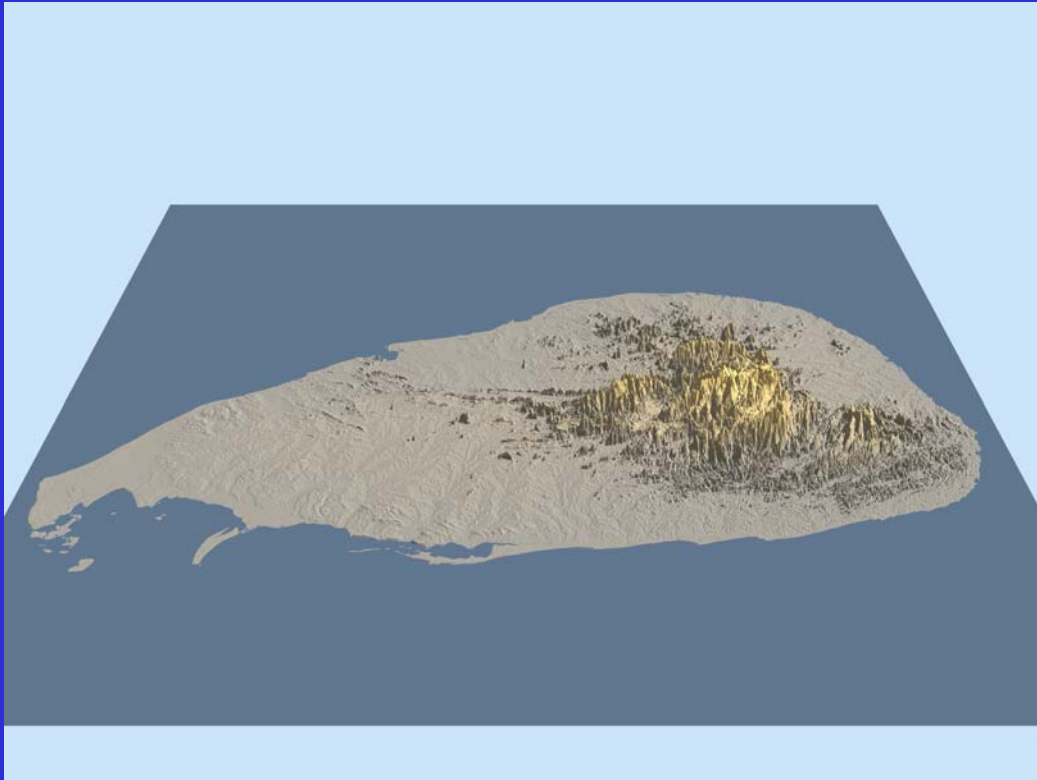
Kaluganga basin (2720 sq km)
Floods

Mahaweli basin (10450 sq.km)
Irrigation water management

Walawe basin (2470 sq.km)
Irrigation water management

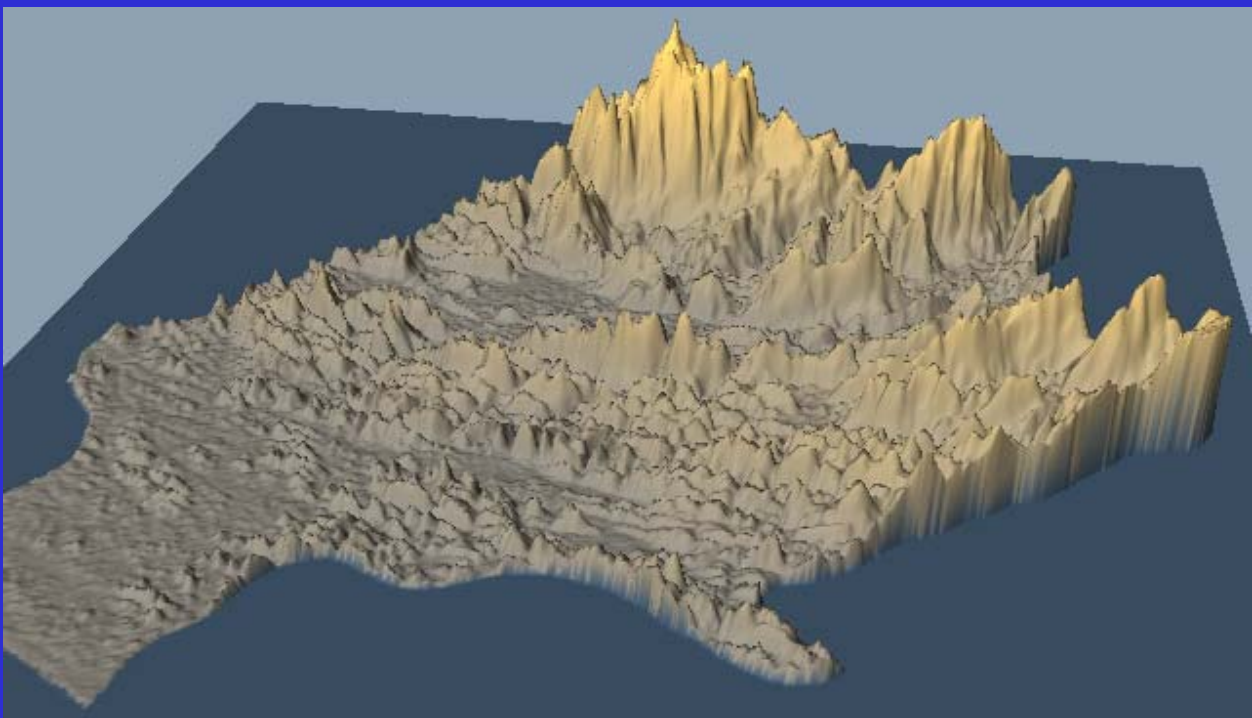


Sri Lankan topography



- significant spatial variation of climate, r/f, geology, soil, land cover,...

Kaluganga Basin

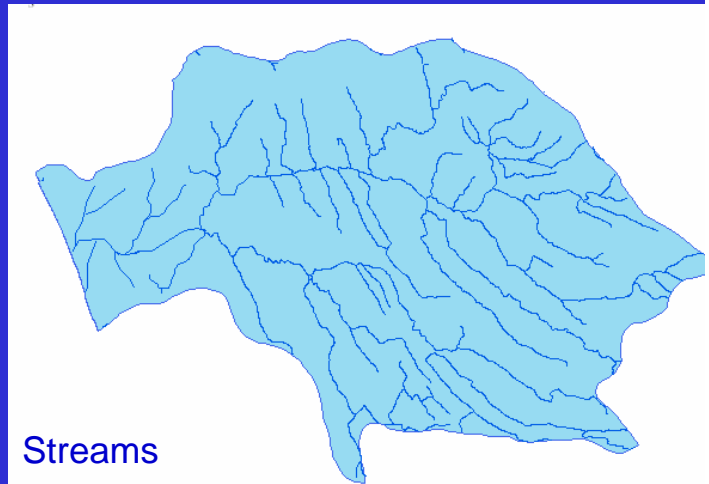


Kaluganga Basin

Magnitude of the annual flow volume	4000 MCM
Catchments area	2690 sq. km
Average annual rainfall	4000 mm (3000-5000mm)
Elevation up to	2250 m
River length	129 km
Length to Ratnapura	65 km

Major floods to Ratnapura 20mMSL

Year	Water level/(m MSL)
1913	24.6
1940	24.3
1941	24.4
1947	24.8
2003	23.7

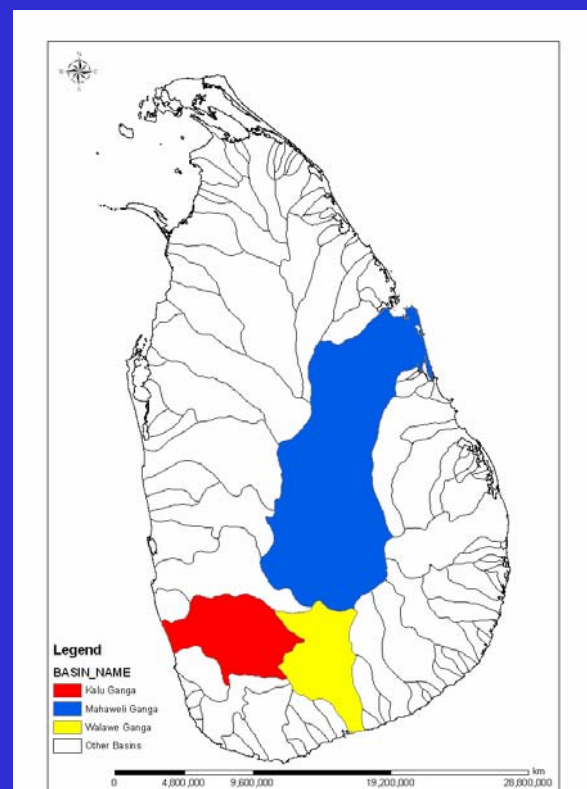
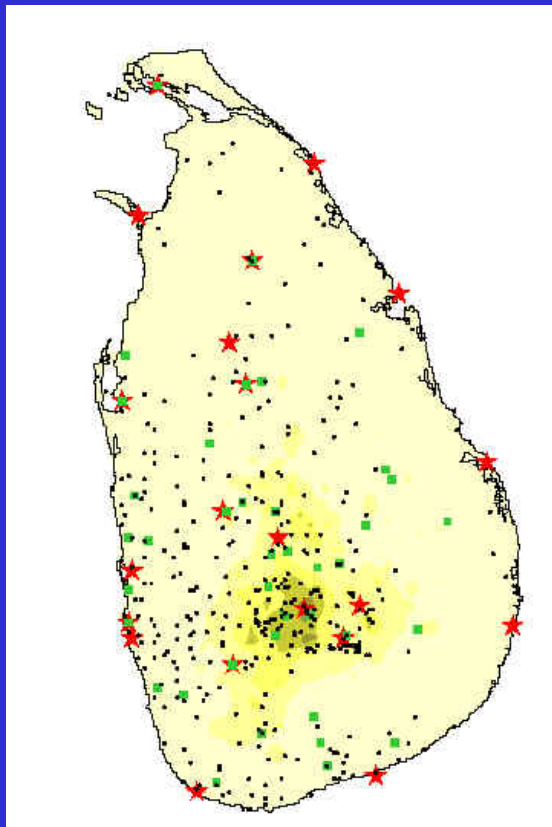


★ Principal Meteorological Stations

■ Agrometeorological Stations

■ Raingauge Stations

Meteorological Station Network



Data in Demonstration Basins

Reference basin	Sri Lanka Mahaweli Basin	Sri Lanka Kaluganga Basin	Sri Lanka Nilwalaganga Basin
METADATA (River Basin Description)			
Location (longitude and latitude extent)	(06°45' N, 80°40' E to 08°30' N, 81°15'E)	(06°25' N, 80°00' E to 06°50' N, 80°40'E)	(06°00' N, 80°25' E to 06°30' N, 80°45'E)
Catchment outlet longitude and latitude	08deg30min N, 81deg15min E	06deg35min N, 80deg00min E	06deg00min N, 80deg30min E
Catchment area	10448 sqkm	2719 sqkm	971 sqkm
Number of MOLTS points in the basin	1	1	1
MOLTS point1 longitude and latitude	07deg20min N, 80deg38min E	06deg41min N, 80deg24min E	06deg09min N, 80deg25min E
MOLTS point1 elevation	477 meters	34 meters	25 meters
MOLTS point X			
Basin Contacts (Name, office address, phone, fax, email)			
Basin Maps	Available	Available	Available
Basin Pictures	Available	Available	Available
River Network Maps	Available	Available	Available
Soil Maps and Soil Characteristics	Available	Available	Available
Land Use Maps and Vegetation Characteristics	Available	Available	Available
River Constructions (dams, weirs, etc.) - type, location (longitude, latitude)	Available	Available	Available

Data in Demonstration Basins

River Constructions (dams, weirs, etc.) - type, location (longitude, latitude)	Available	Available	Available
OBSERVATION DATA - HYDROLOGICAL			
Streamflow	Available	Available	Available
Reservoir (Water level, Outflow)	Available	Available	Available
Others - please specify (each data type on a single line)			
OBSERVATION DATA - SUB-SURFACE			
Soil Temperature	Available	Available	Unavailable
OBSERVATION DATA - SURFACE			
Air Temperature	Available	Available	Unavailable
Humidity	Available	Available	Unavailable
Wind	Available	Available	Unavailable
Pressure	Available	Available	Unavailable
Precipitation	Available	Available	Available
Evaporation	Available	Available	Available
Radar and Radiosonde observations are available in Colombo (06°54' N, 79°85' E) but outside of the three selected basins			

Demonstration Project

- Data preparation for DHM applications
 - Kaluganga basin hydrology details
 - Daily time series data of stream flow at five locations (two years)
 - River cross sections at 5 locations
 - Daily rainfall time series at 10 locations
 - GIS data DEM, landuse, stream network in the basin

Rainfall downscaling for the basin

Using Global Climate Model and WRF

rainfall forecasting was downscaled to cover the demonstration project region

The reliability of predictions need to be verified and appropriate model parameters need to be selected for individual basins - preliminary results.

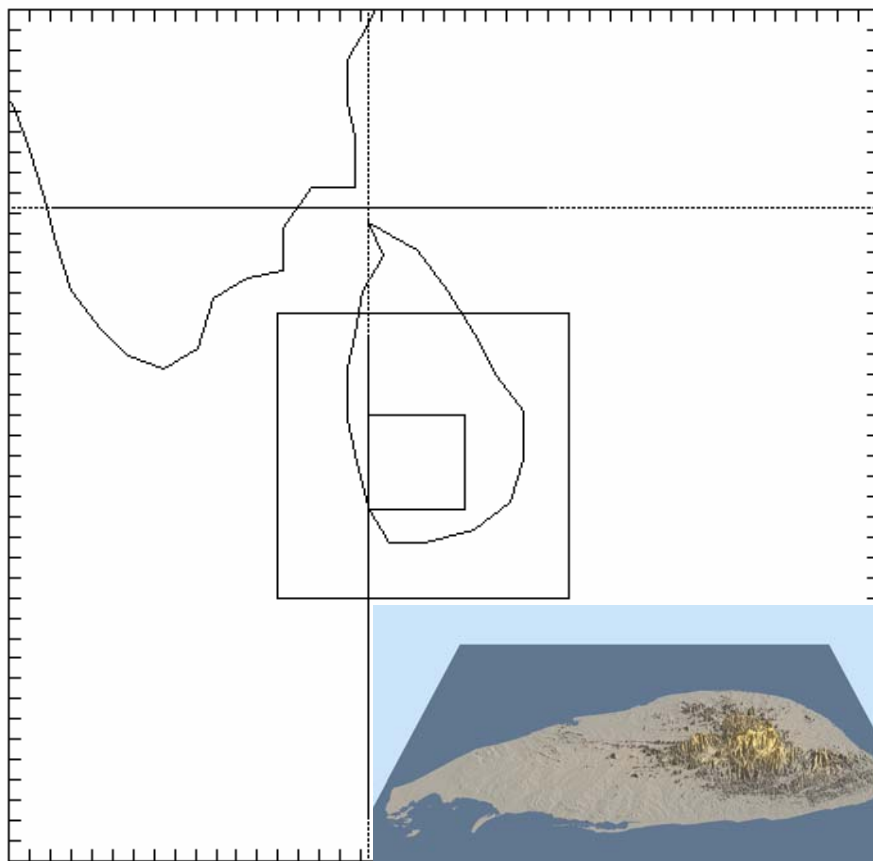
Domains

43 x 43 in each
three nests of

27, 9, 3 km
square cell
sizes

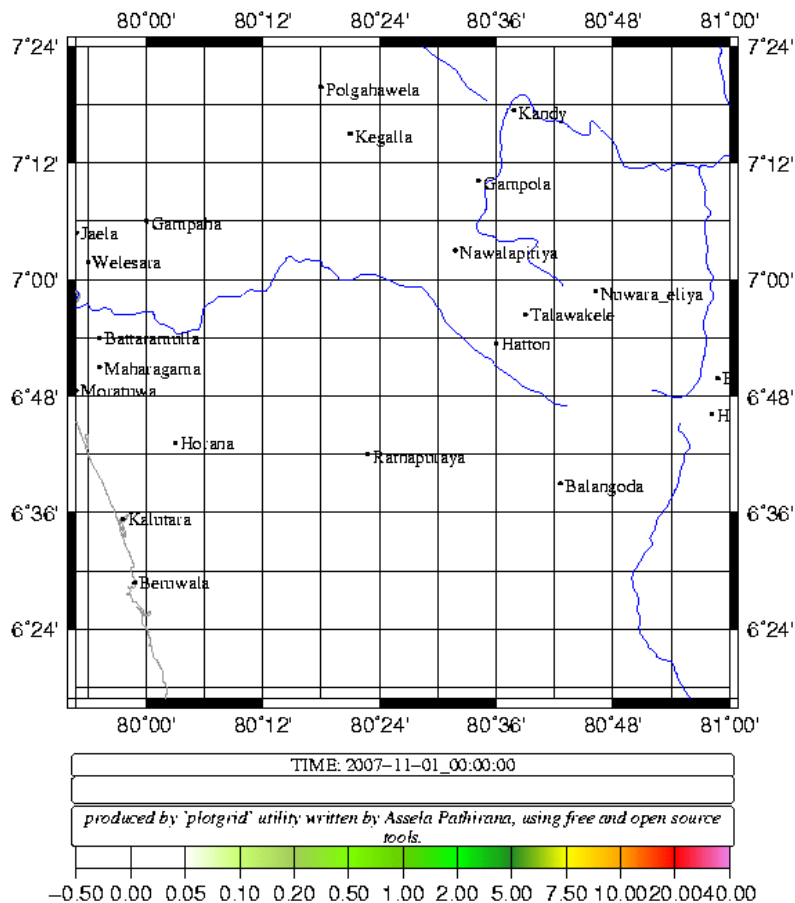
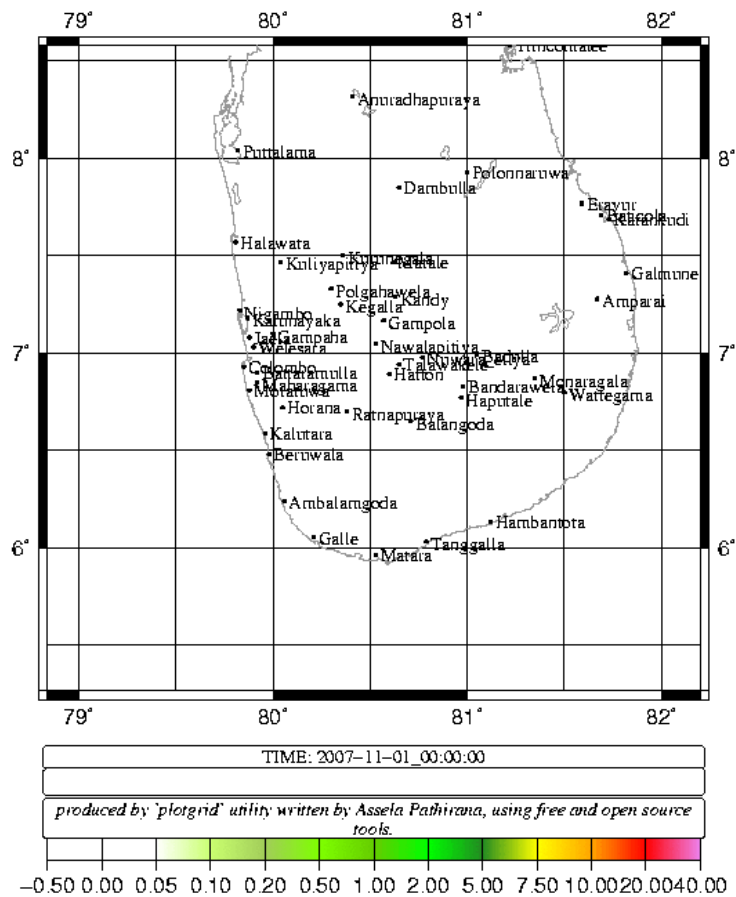
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ref_lon = 80.763



Simulation Control Parameters

- start_date = 2007-11-01_00:00:00
- end_date = 2007-11-01_12:00:00
- time_step = 120
- interval_seconds for gfs data = 10800
- history_interval = 10



Capacity building

- Training Workshops
 - Hydrological Modelling Workshop
 - Computational Hydraulic Modelling Workshop
- Resource Persons:
 - From the University of Peradeniya,
 - Visiting Scholars from abroad
- Participation
 - 30 engineers in water sector in Sri Lanka



Devon waterfall
(Upper Kotmale Subbasin)

Thank You

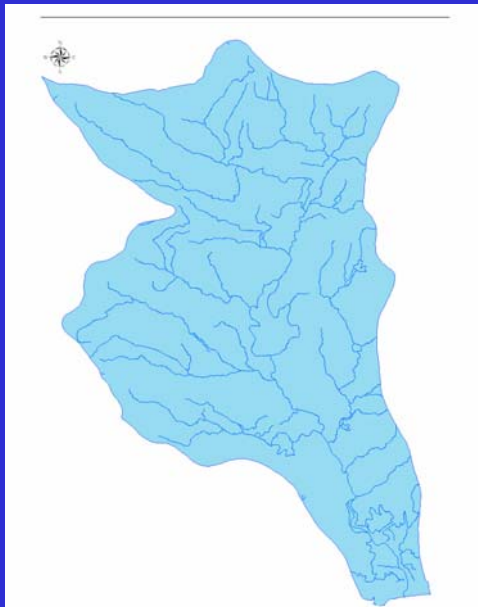
Walawe Basin

Catchments area

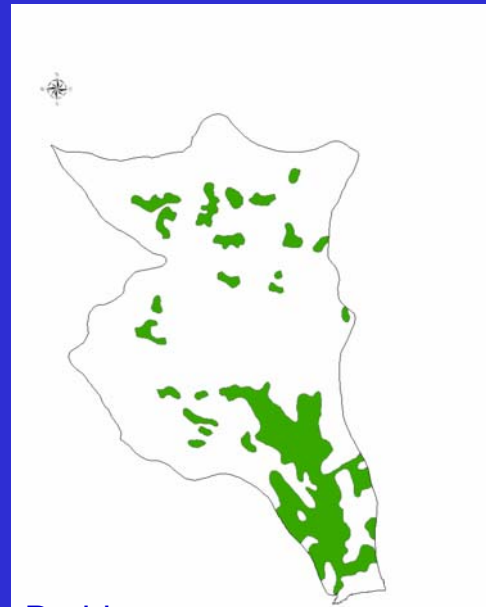
2690 sq. km

Average annual rainfall

1000-3000 mm



Streams



Paddy

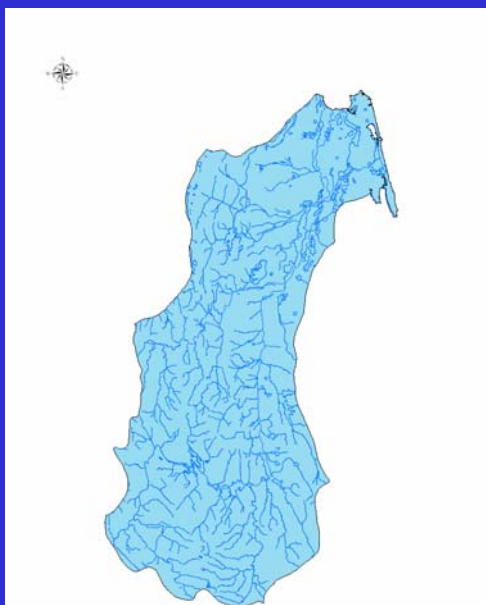
Mahaweli Basin

Catchments area

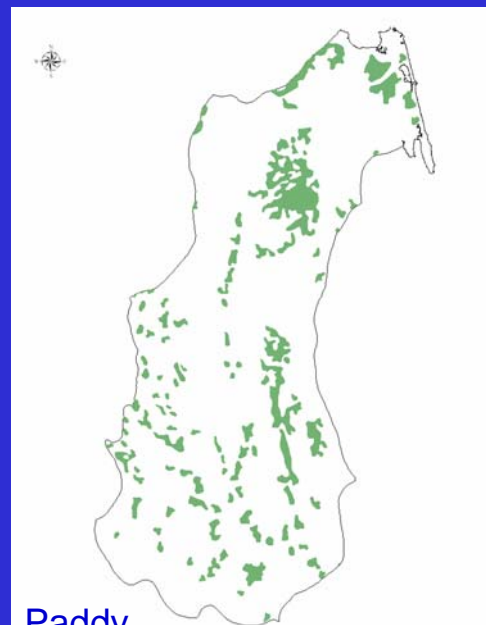
10450 sq. km

Average annual rainfall

1500-5000 mm



Streams



Paddy