DROUGHT MONITORING AND MANAGEMENT IN SRI LANKA

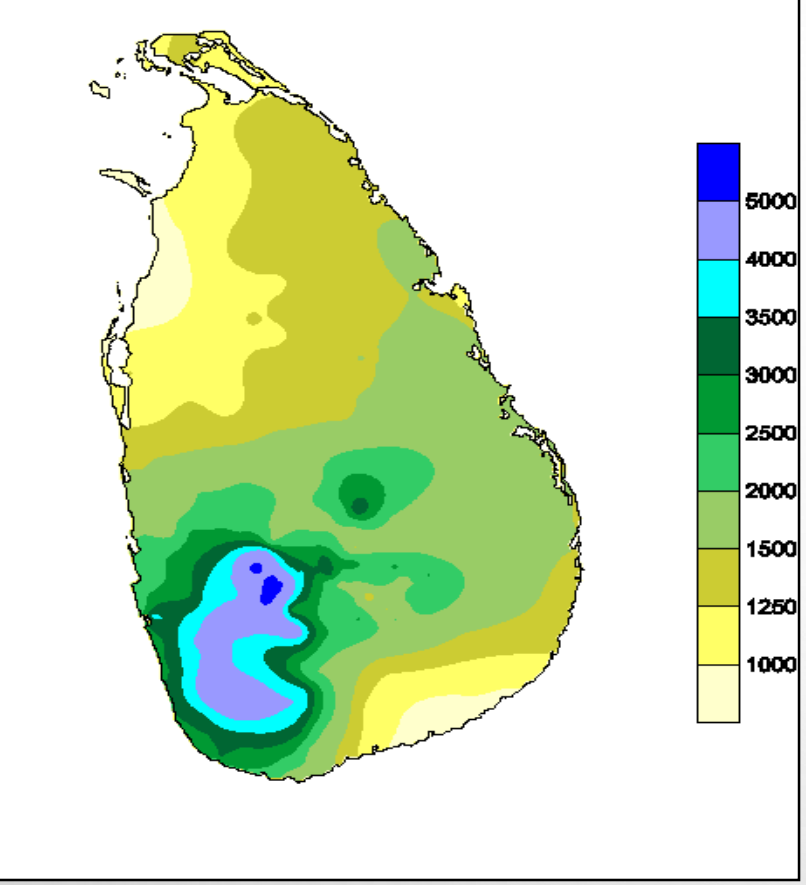
S.AMALANATHAN

H.K.KADUPITYA

LAL.INDUWAGE.

M JUNAID

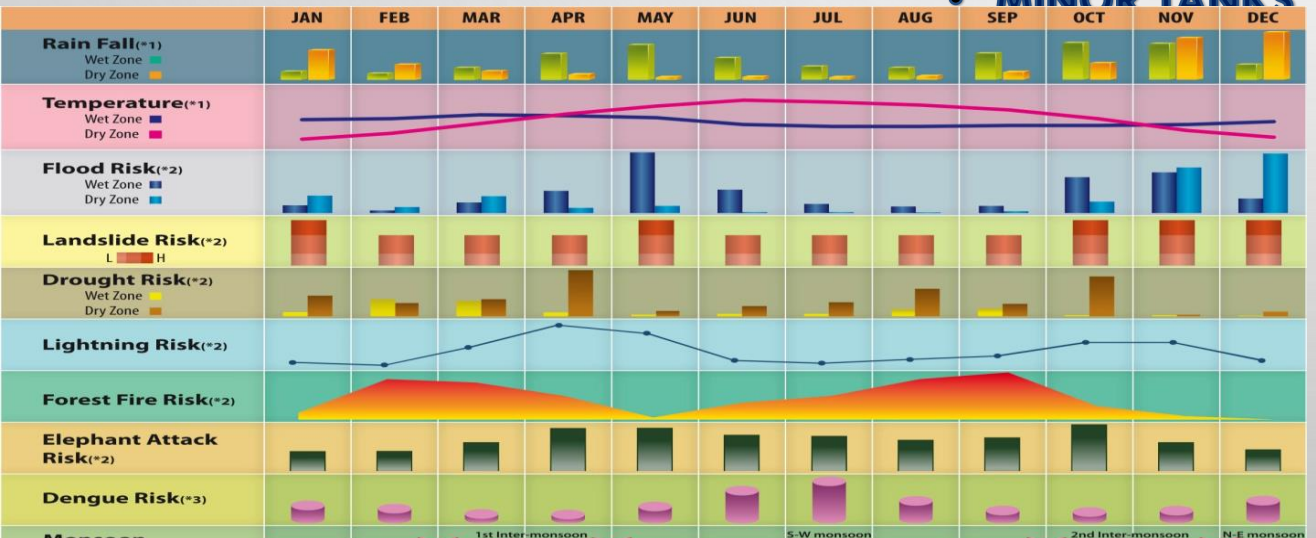
SRI LANKA



TOTAL LAND	- 65,000 KM2
INLAND WATER	- 980 KM2
COASTLINE	-1660 KM
UP COUNTRY	- 2300 M

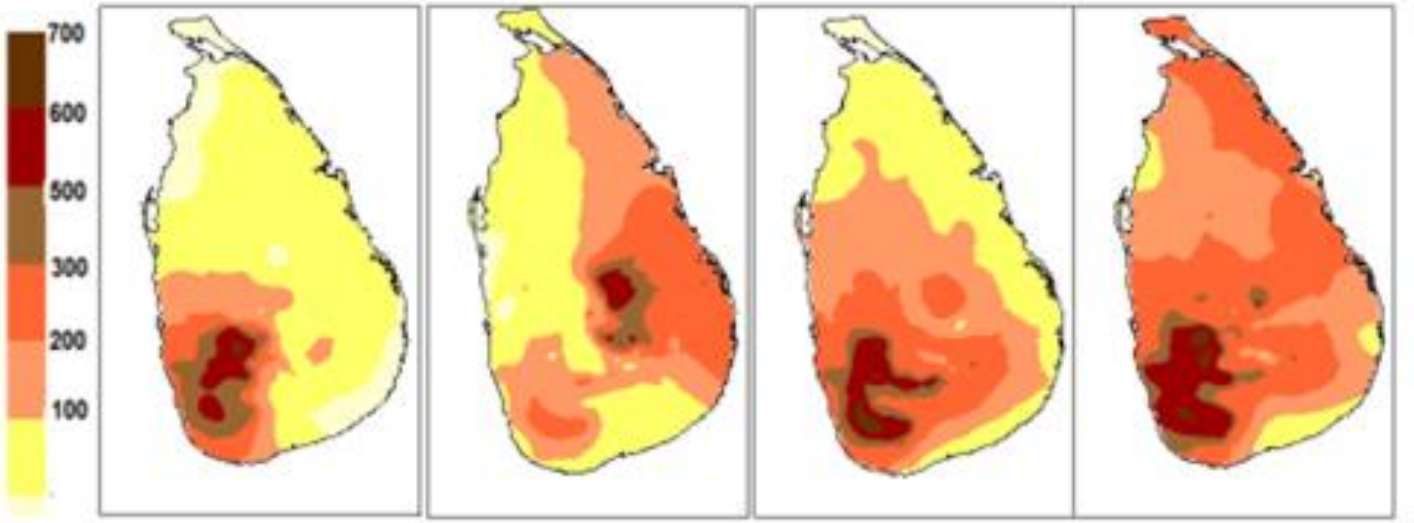
AVERAGE TEMPERATURE	- 32 C
AVERAGE RAIN FALL	- 1850MM
ANNUAL RAIN VOLUME	– 122 KM3

- RIVER BASINS -103 (20 WET ZO)
- DAMS -320
- MAJOR IRRIGATION TANKS -73
- MINOR TANKS -14470



PADDY CULTIVATION LAND	- 839,903 HA
MAJOR IRRIGATION	- 45%
MINOR IRRIGATION	- 24%
RAIN-FED	- 31

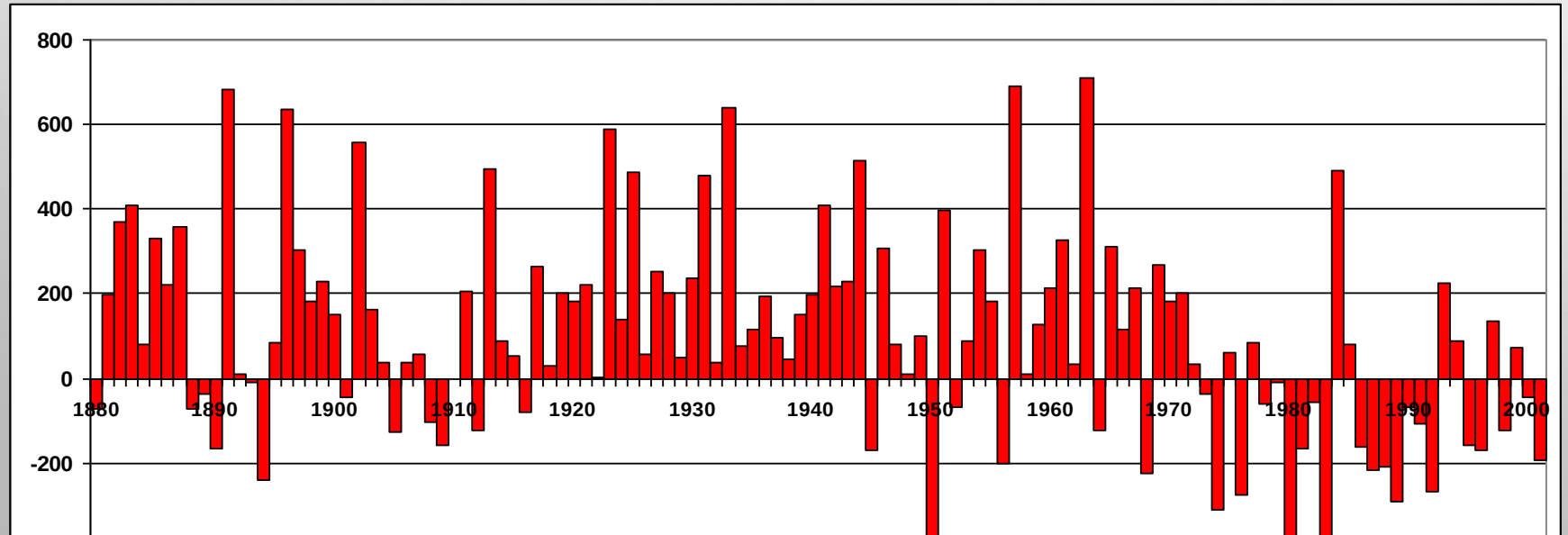
Four Rain Seasons



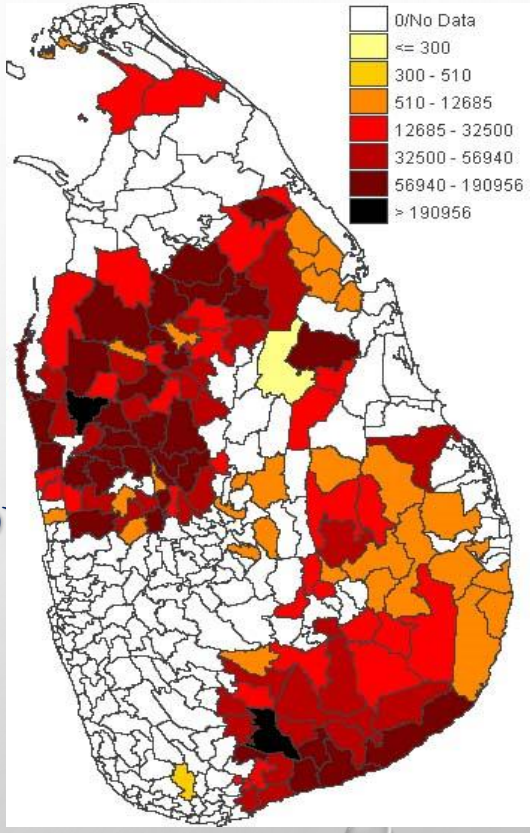
SEASON	*Southwest Monsoon*	*Northeast Monsoon*	*First Intermonsoon*	*Second Intermonsoon*
PERIOD	May-Sep	Dec-Feb	Mar-Apr	Oct-Nov
RAINFALL	546 mm	459 mm	260 mm	548 mm
	30 %	25 %	15 %	30 %

CHANGING CLIMATE – EXTREME WEATHER

- THE COUNTRY'S MEAN AIR TEMPERATURE INCREASED BY 0.016 0C PER YEAR ,
- MEAN ANNUAL PRECIPITATION DECREASED BY 144 MILLIMETERS (MM) (7%)
- NUMBER OF WARM-DAYS AND WARM-NIGHTS HAS INCREASED
- NUMBER OF COLD-DAYS AND COLD-NIGHTS HAS DECREASED
- UNEXPECTED HUGE VOLUME OF RAIN FALL RECEIVES IN A SHORTER PERIOD
- AN INCREASING TREND OF OCCURRENCE OF EXTREME RAINFALL EVENTS-DRO

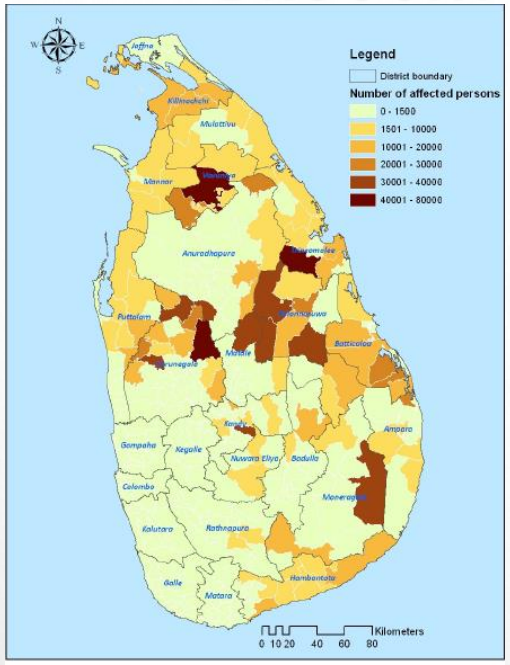


NUMBER OF AFFECTED PEOPLE BY DROUGHT

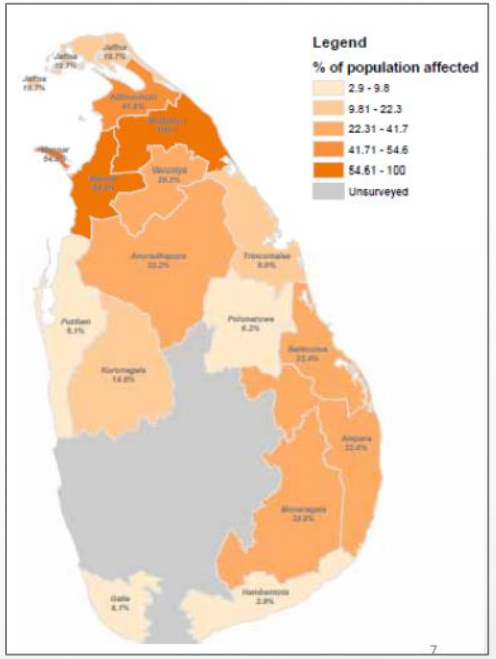


• DROUGHT IMPACT OVER SIX YEARS

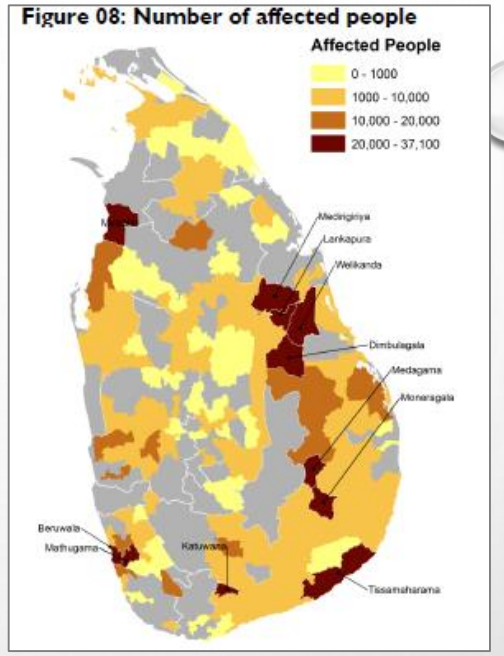
- **AFFECTED POPULATION**
- **AGRICULTURE DAMAGE**



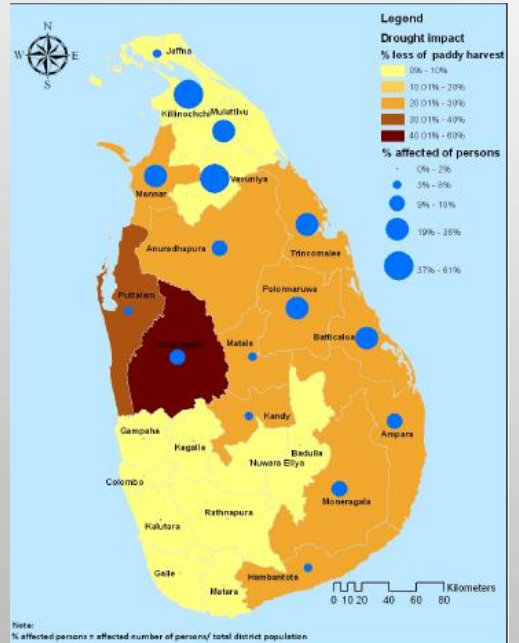
2012

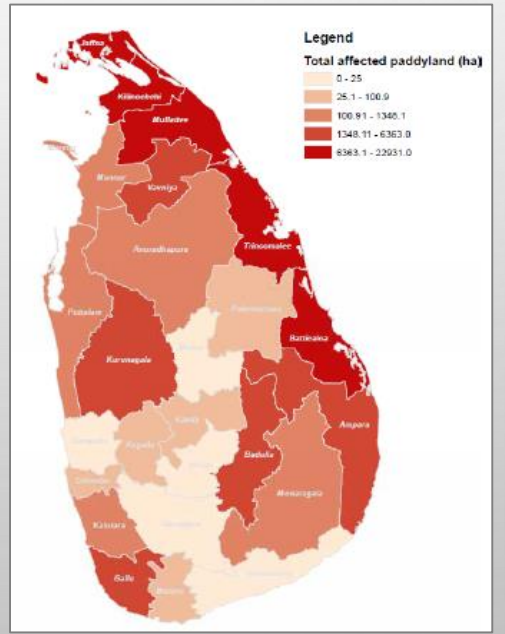


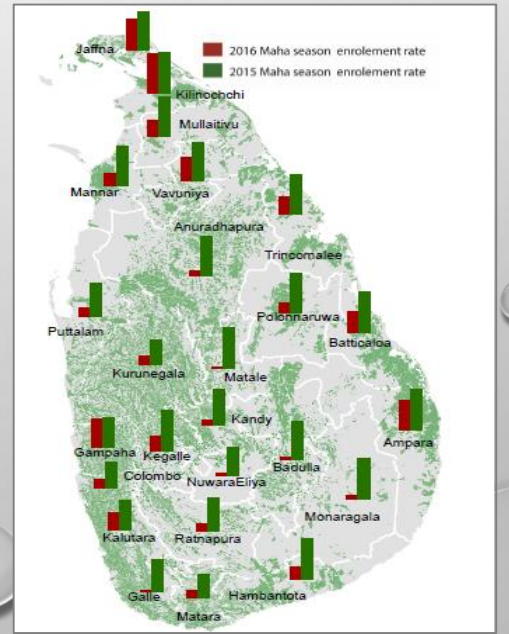
2014



2016







DROUGHT SOCIO ECONOMIC IMPACT 2016/17

- ONLY 23% OF WATER AVAILABLE IN MAJOR IRRIGATION SCHEMES (73 TANKS)
- 14,500 SMALL SCALE TANKS, 13,300 ANICUTS AND 7,100 SMALL CANALS HAVE REACHED CRITICAL CAPACITY
- 55% OF HOUSEHOLDS ARE DEPENDING ON WELL-WATER IN THE ENTIRE DRY-ZONE, SEVERELY AFFECTED
- ONLY 326,781HA OF PADDY LANDS OUT OF 808,539 HA HAVE BEEN CULTIVATED– 40 %. THIS IS THE LOWEST CULTIVATION LEVEL EXPERIENCED IN SRI LANKA IN REPORTED DURING THE LAST THIRTY YEARS.
- HYDRO POWER GENERATION HAS DECREASED TO 40% OF AVERAGE PRODUCTION (480GWH OUT OF 1250GWH)

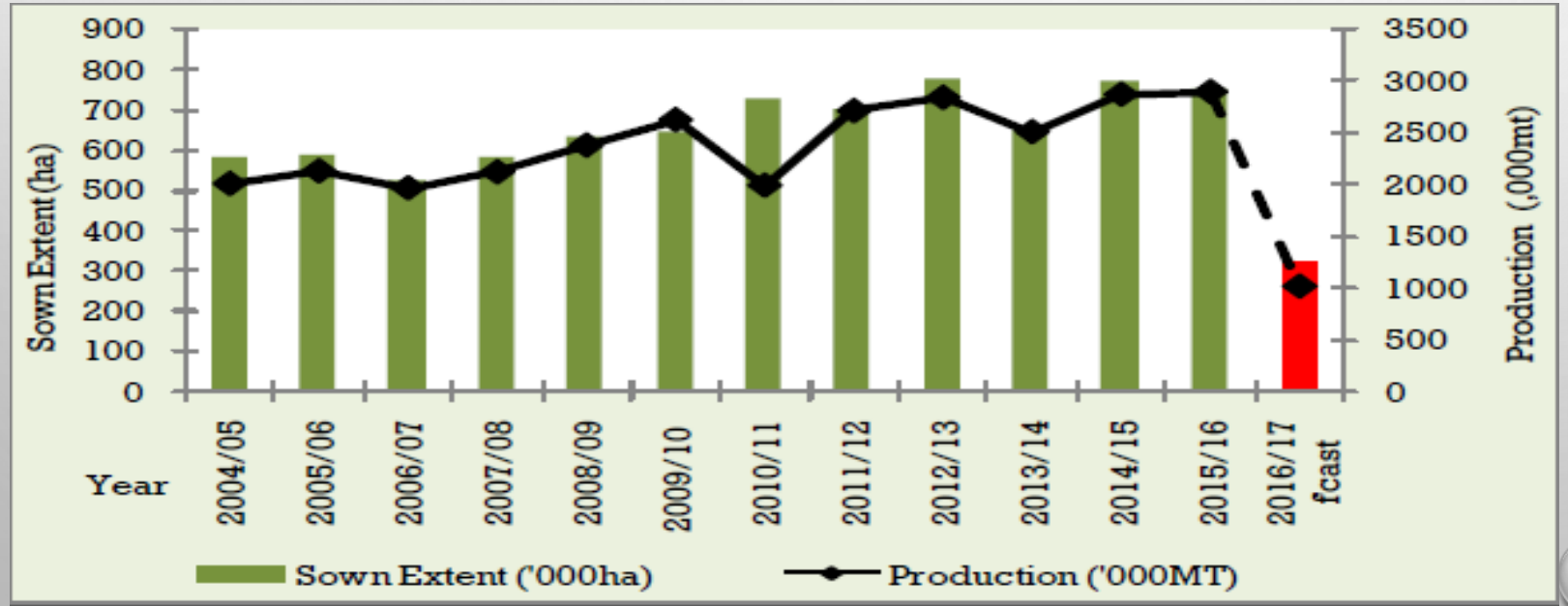
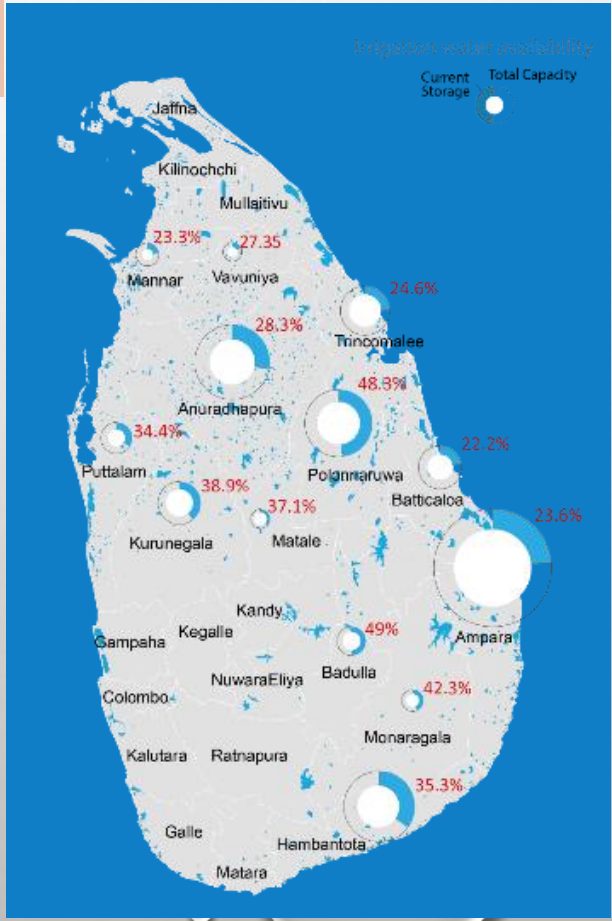
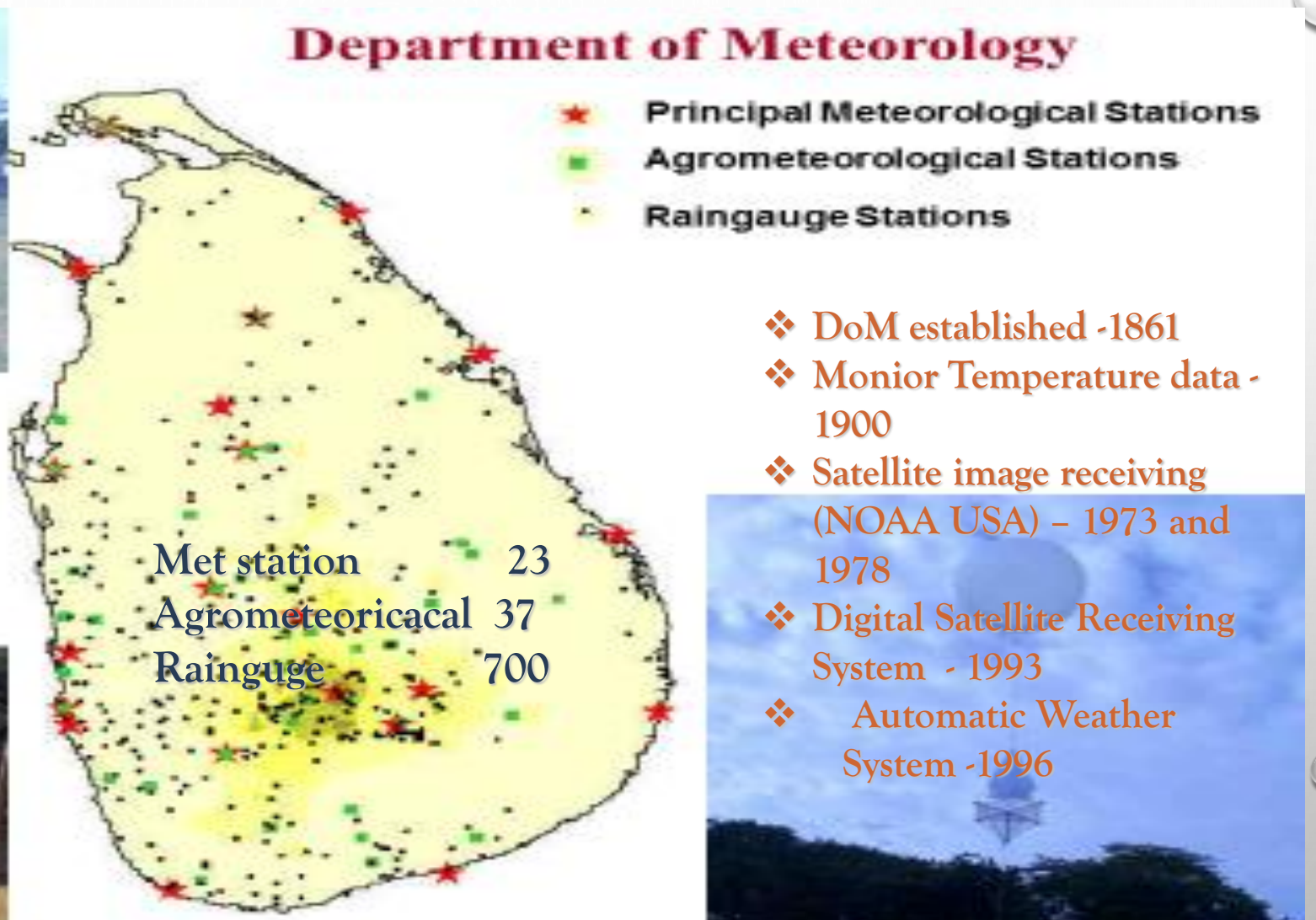


Figure 2: Paddy: Trend of paddy sown extent and production in Maha seasons

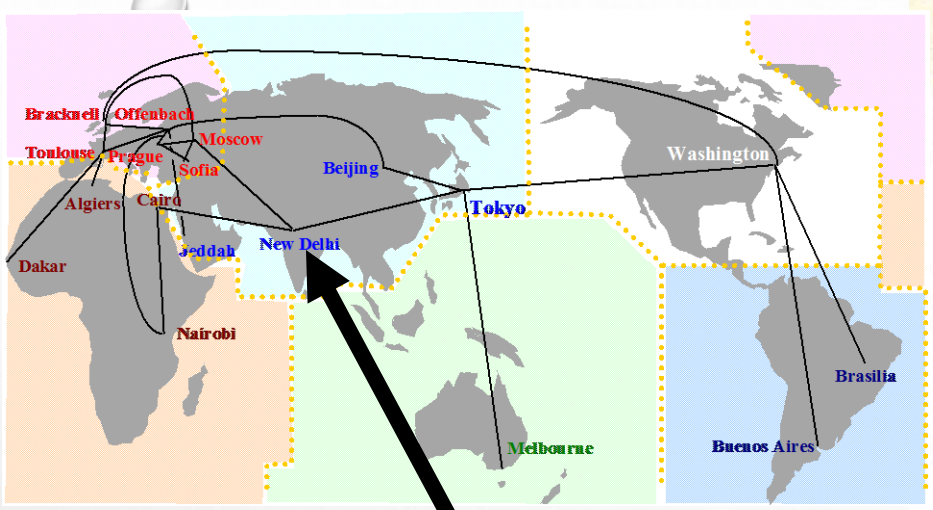


CLIMATE/WEATHER MONITORING

Meteorological Station Network



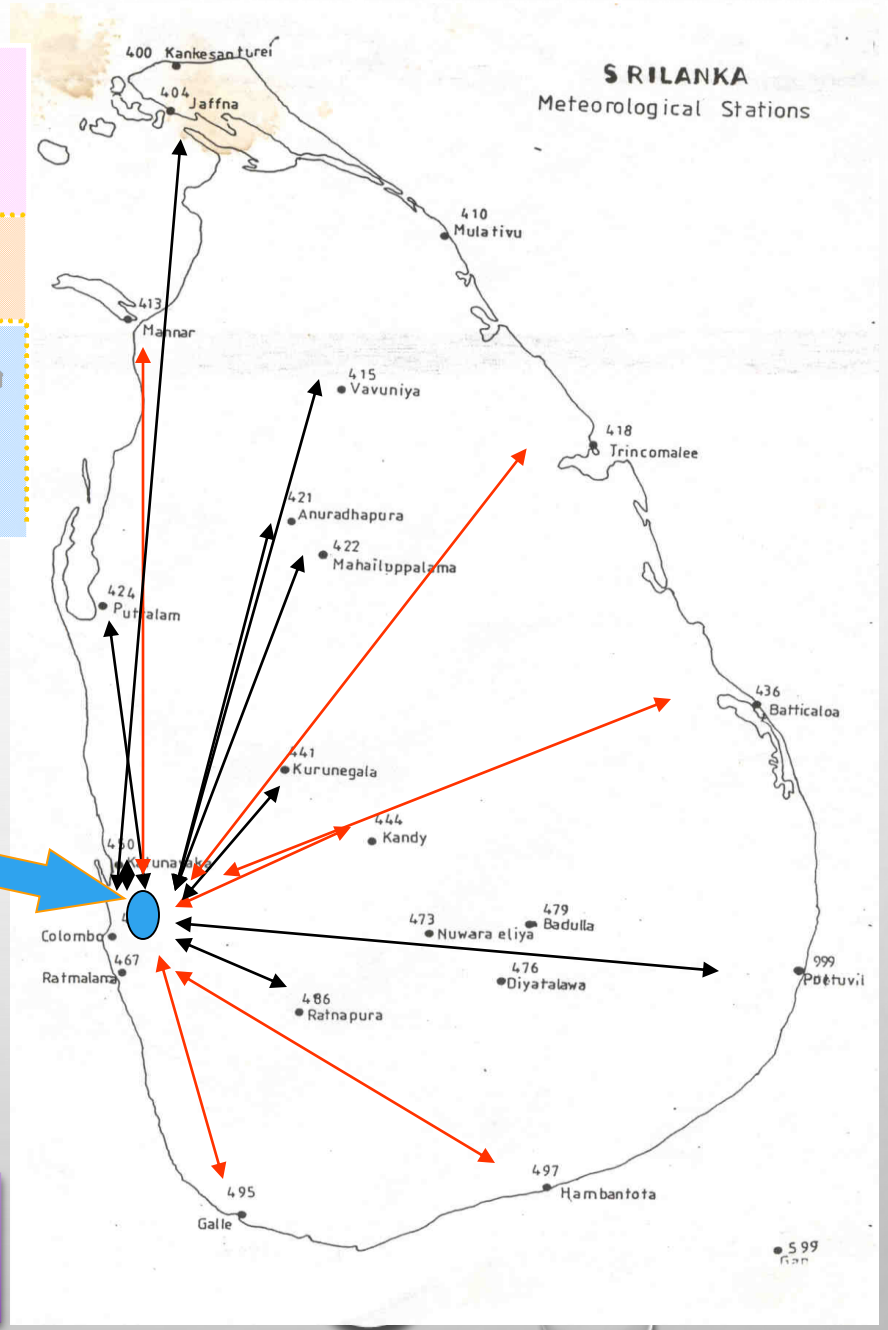
- DoM established -1861
- Monior Temperature data - 1900
- Satellite image receiving (NOAA USA) – 1973 and 1978
- Digital Satellite Receiving System - 1993
- Automatic Weather System -1996



FEW YEARS BACK TELECOMMUNICATION LINE

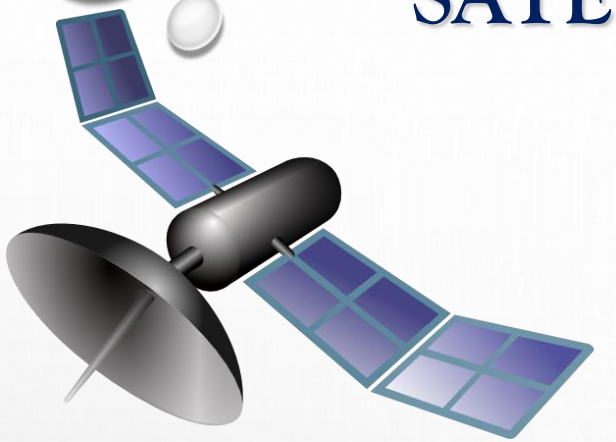
NEW DELHI

AT PRESENT TCP-IP



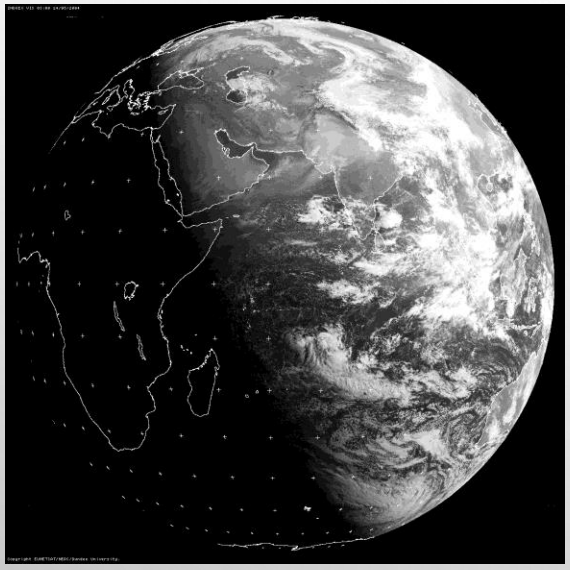
TRANSMISSION CONTROL PROTOCOL (TCP) AND THE INTERNETPROTOCOL (IP)

SATELLITE TECHNOLOGY

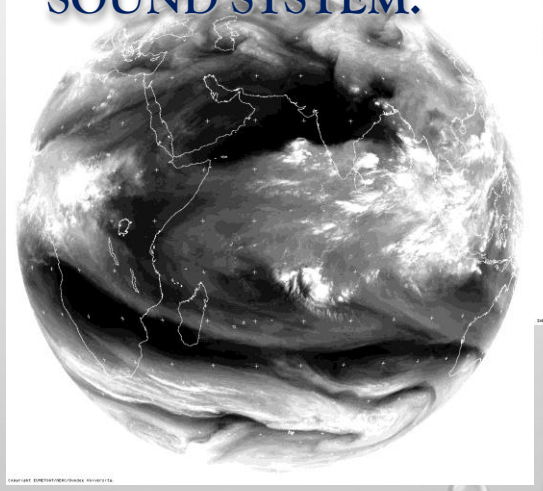


SATELLITE SYSTEM

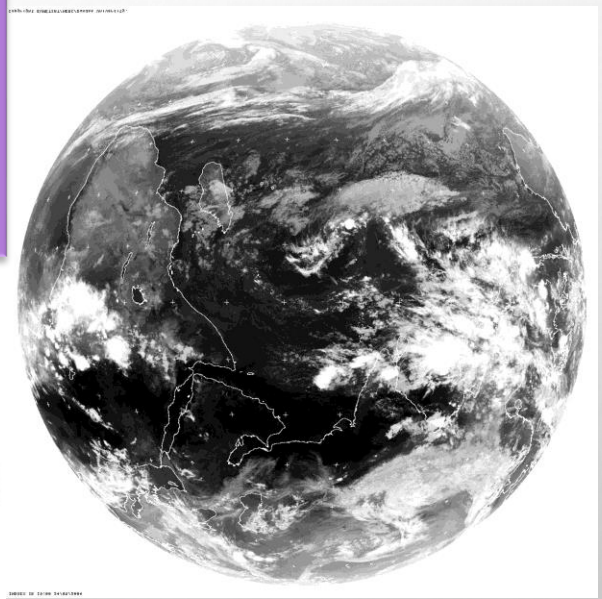
- FENG –YUNG – CHINA
- MULTI PURPOSE SATELLITE SYSTEM – KOREA
- GPS – BASED RADIO SOUND SYSTEM.



Visible



Water Vapor



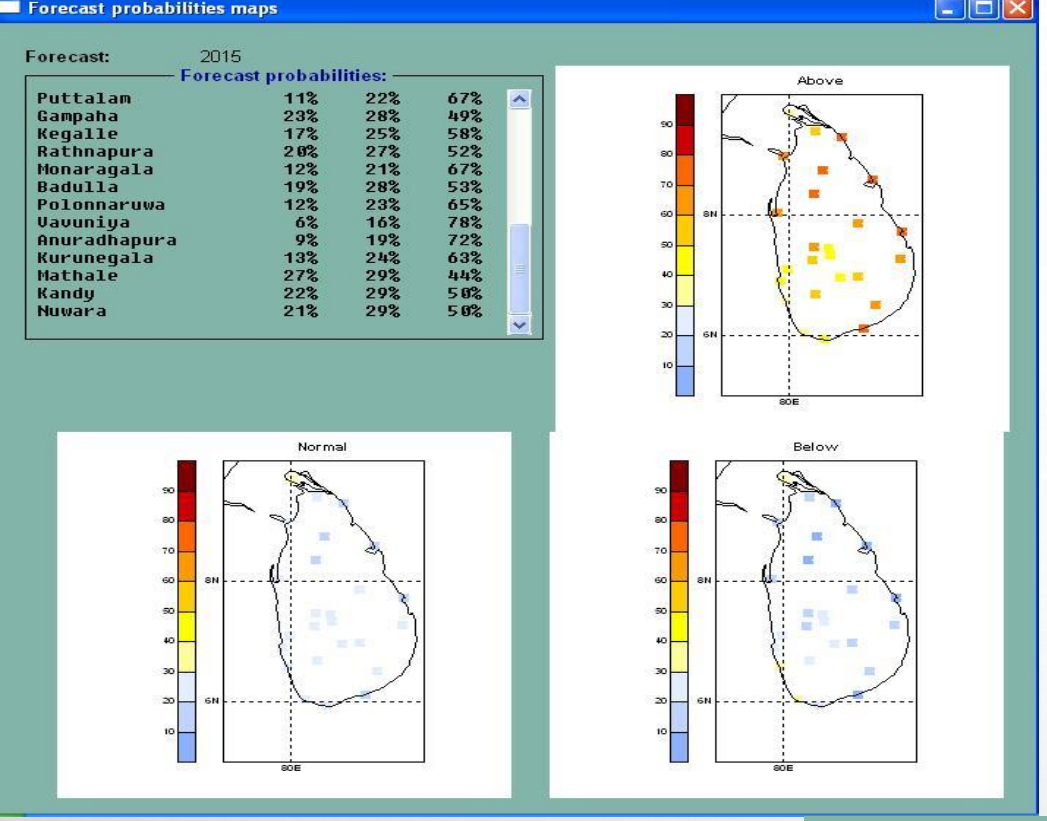
Infra red

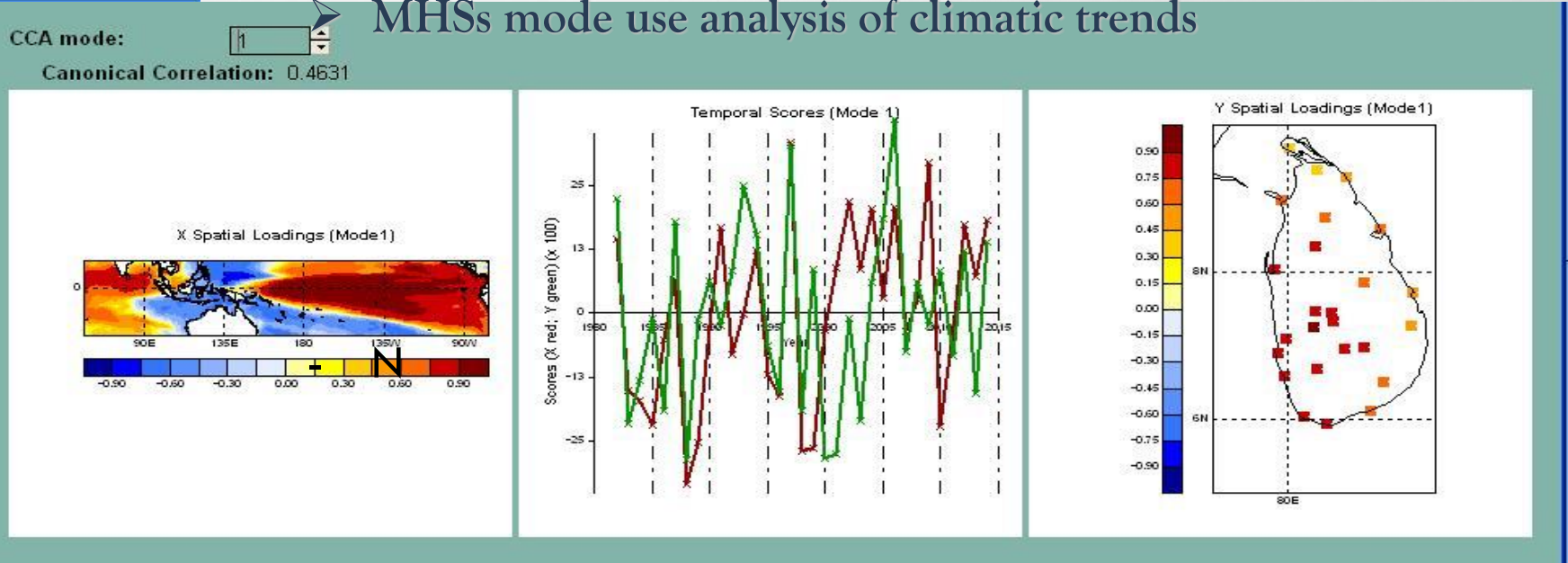
Forecast Products

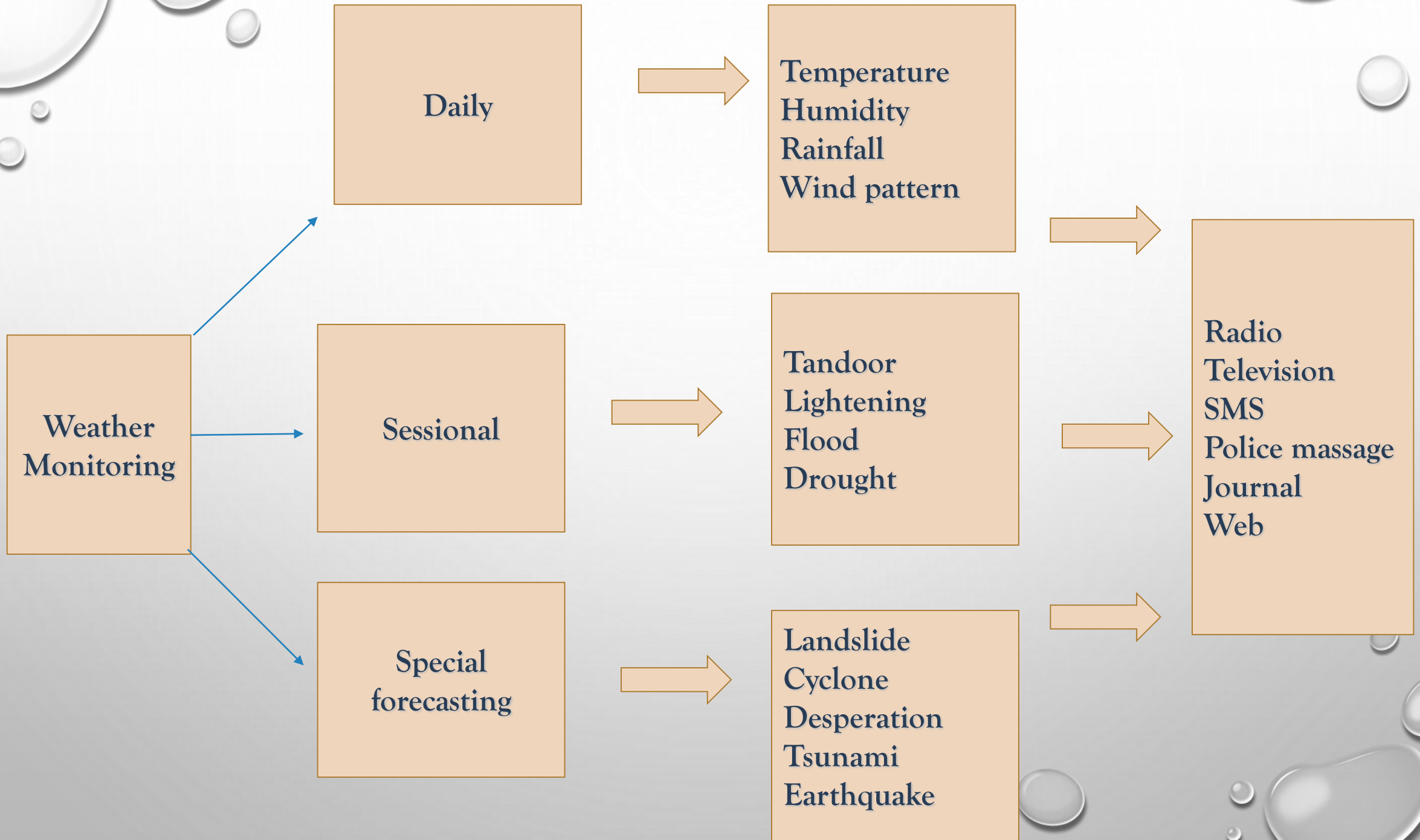
- Statistical Downscaling Climate Predictability Tool

CCA, with SST as predictor and SIM seasonal rainfall as predict and

- Higher probability of receiving above normal rainfall for SIMMHSs mode use analysis of climatic trends
- MHSs mode use analysis of climatic trends






Weather Monitoring
Daily
Sessional
Special forecasting
Temperature
Humidity
Rainfall
Wind pattern
Tandoor
Lightening
Flood
Drought
Landslide
Cyclone
Desperation
Tsunami
Earthquake
Radio
Television
SMS
Police massage
Journal
Web

Weather Prediction Pettern

• Short Range Weather Forecast	1-3 days ✓	Dynamical Methods
•Medium Range Weather Forecast	3-10 days ✗	
• Extended Medium Range	10-30 days ✗	
•Now-casting	Next 1 hour to 3 hs	
•Short Range Weather Forecast	Next 6 hours	

• Long Range Forecast	Next month ✓	Dynamical Methods/ Statistical Method
• Seasonal Forecast	Monsoon ✓	
• Climate Forecast	100 years✓	
•		

To prepare Weather Forecast in above time scales

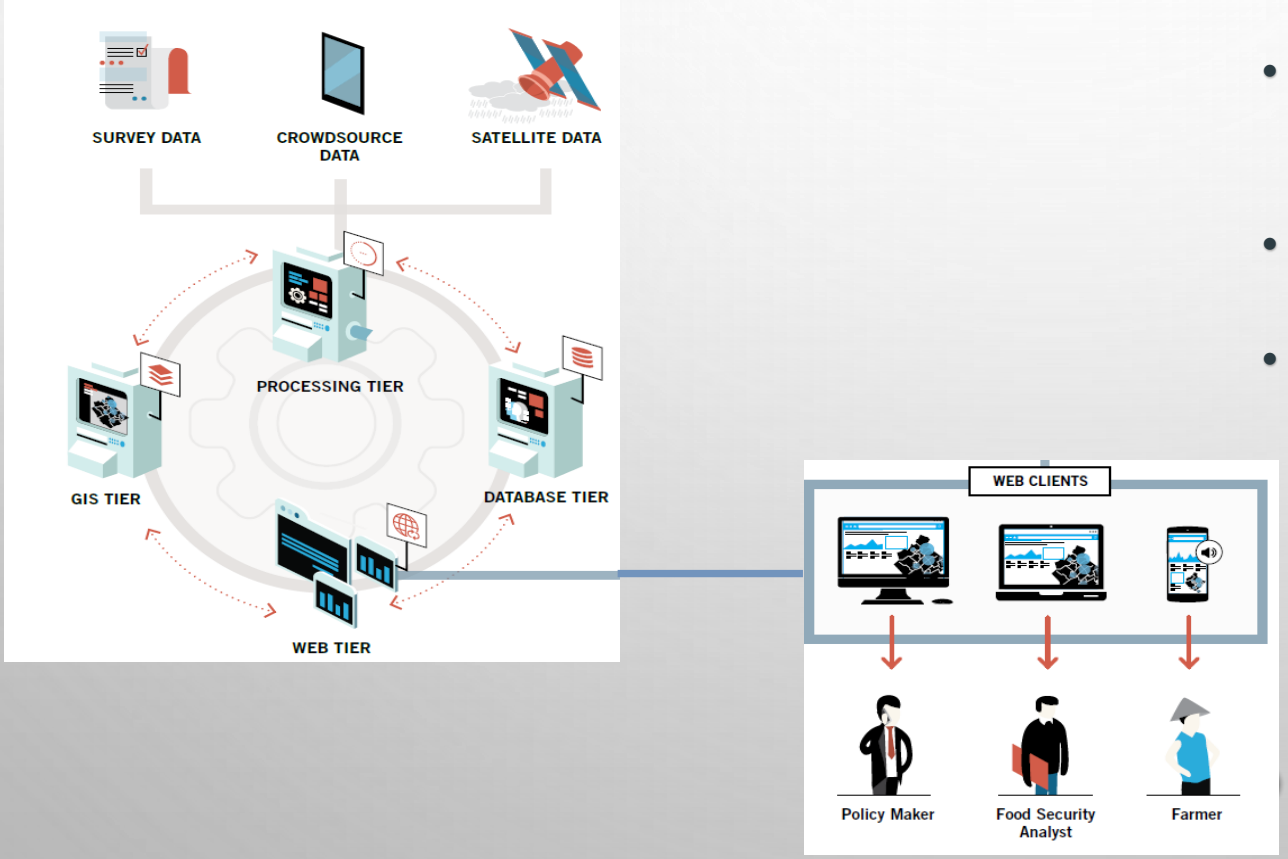
- Speed Data Communication Technology
- High speed computers
- More sophisticated, accurate and reliable Weather Measuring instrument
- Mathematical and Scientific knowledge about Atmosphere and its motion

Challenges

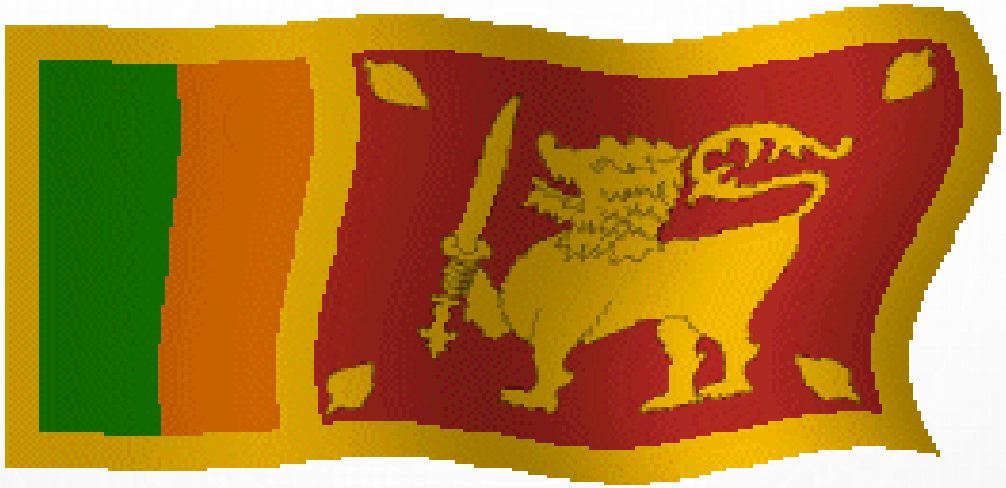
- Real/ accurate information
- satellite (remote sensing data) downscaled images
- Data analyzing system
- Advanced equipment (computer servers to run models)
- Dissemination network
- Transformation of modem technology
- online monitoring (Tank, wells, rivers, ground water
- Appropriate dissemination of product (seasonal calendars)

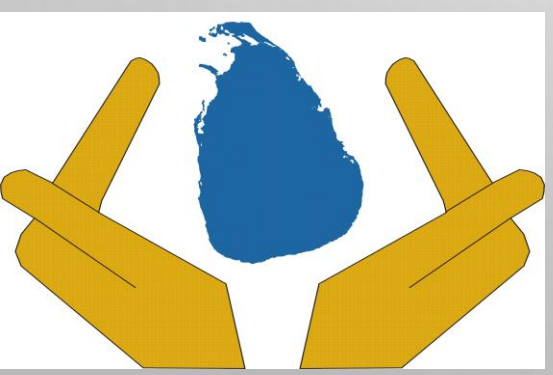
Proposed drought monitoring system

- proposed integrated drought monitoring system is a multi-tier system that fuses satellite precipitation data, crowdsourced food price data and community feedback data
- provides integrated visualizations of the extent of drought affected areas, the impact on food market structure and pricing, and the coping strategies and resilience of affected populations which facilitates early warning, preparedness and response



- Establishment of Doppler Weather Radar systems
- Expand the automated Rainfall Network
- On line up dating and desamination system





Thank you.