

Droughts

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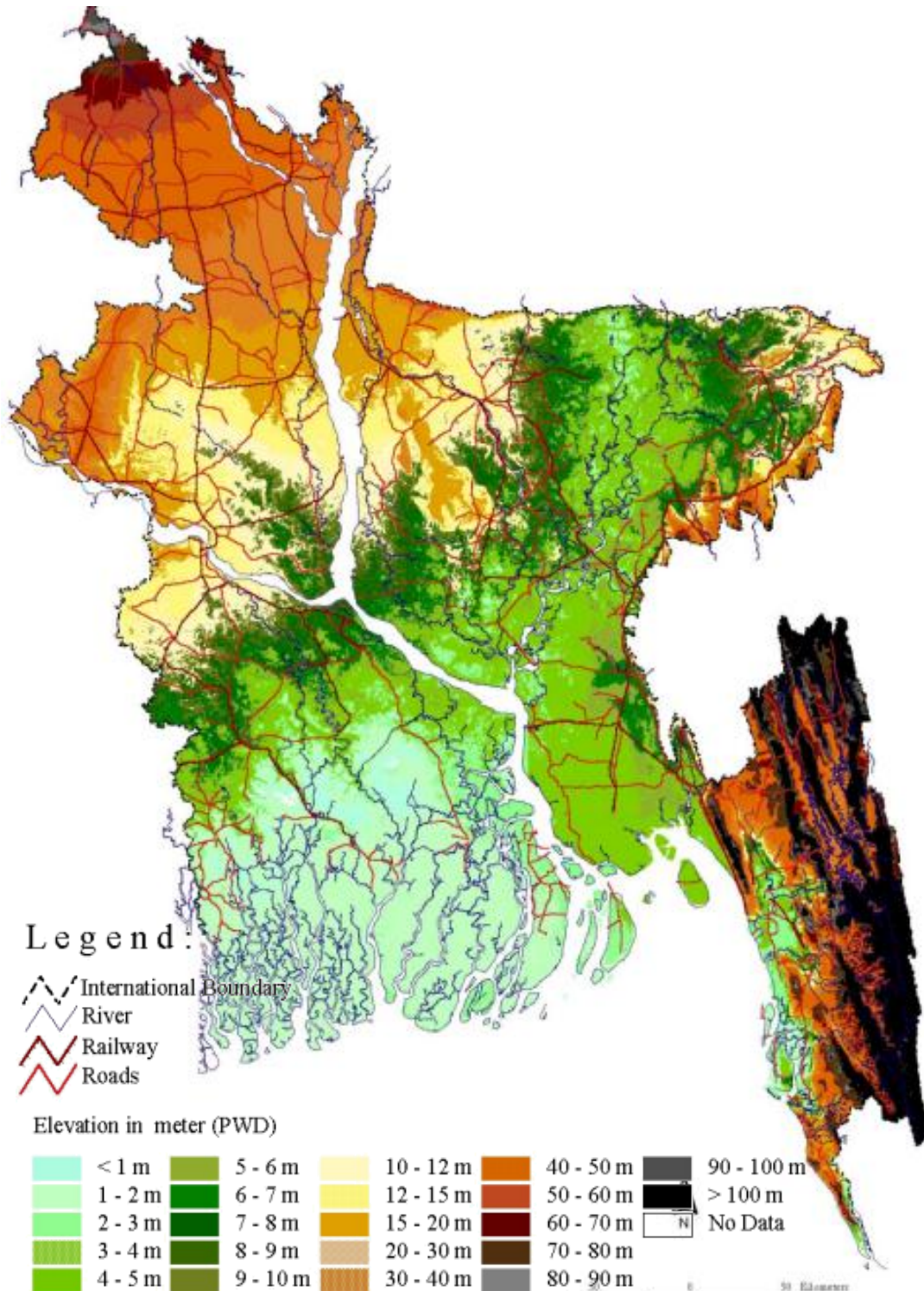
Asstt. Director

BMD

Position of Bangladesh in the World Map and in the Asia Map



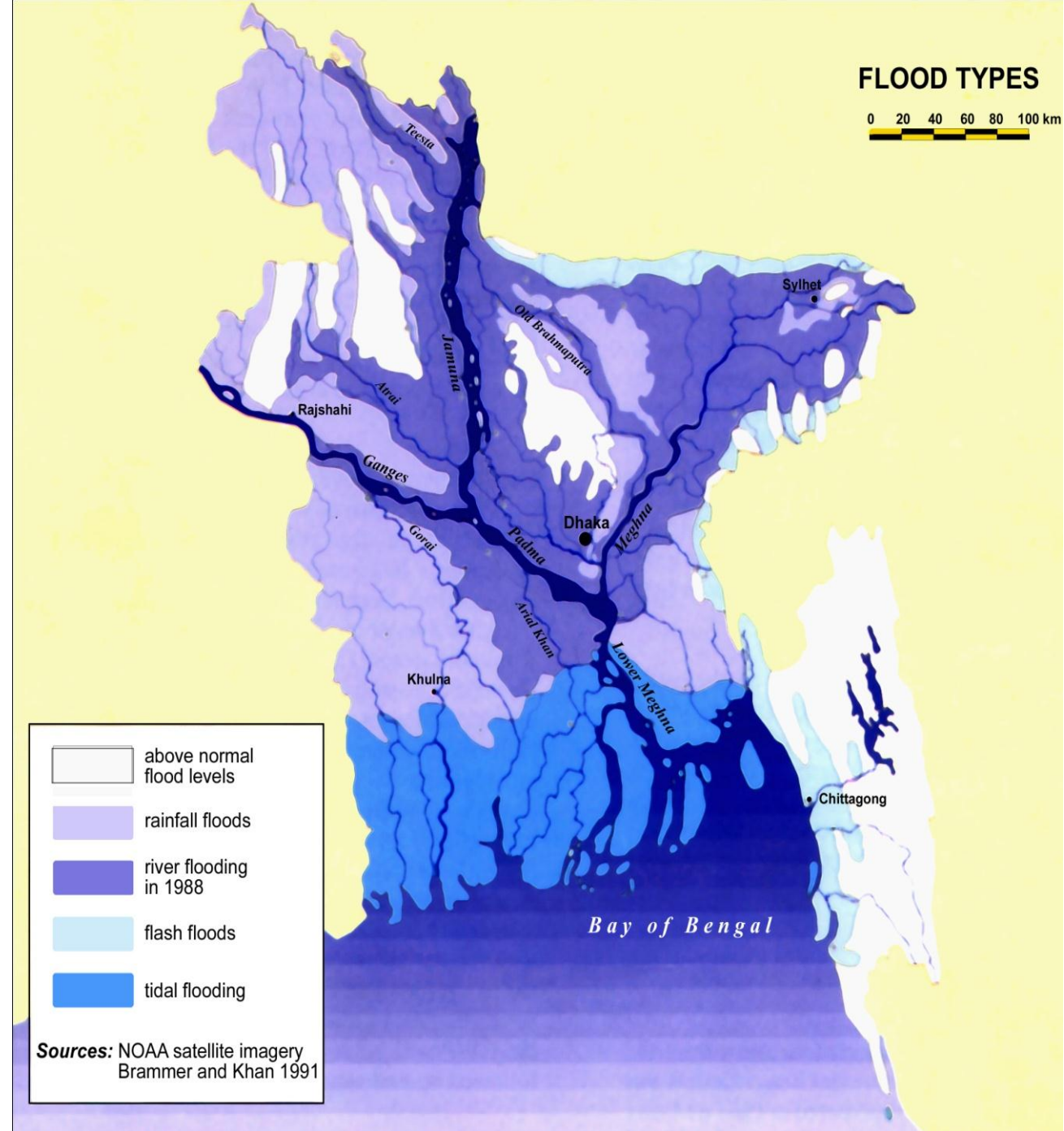
Topography of Bangladesh



- Land elevation of 50% of the country is within 5 m of MSL
- About 68% of the country is vulnerable to flood
- 20-25% of the area is inundated during normal flood

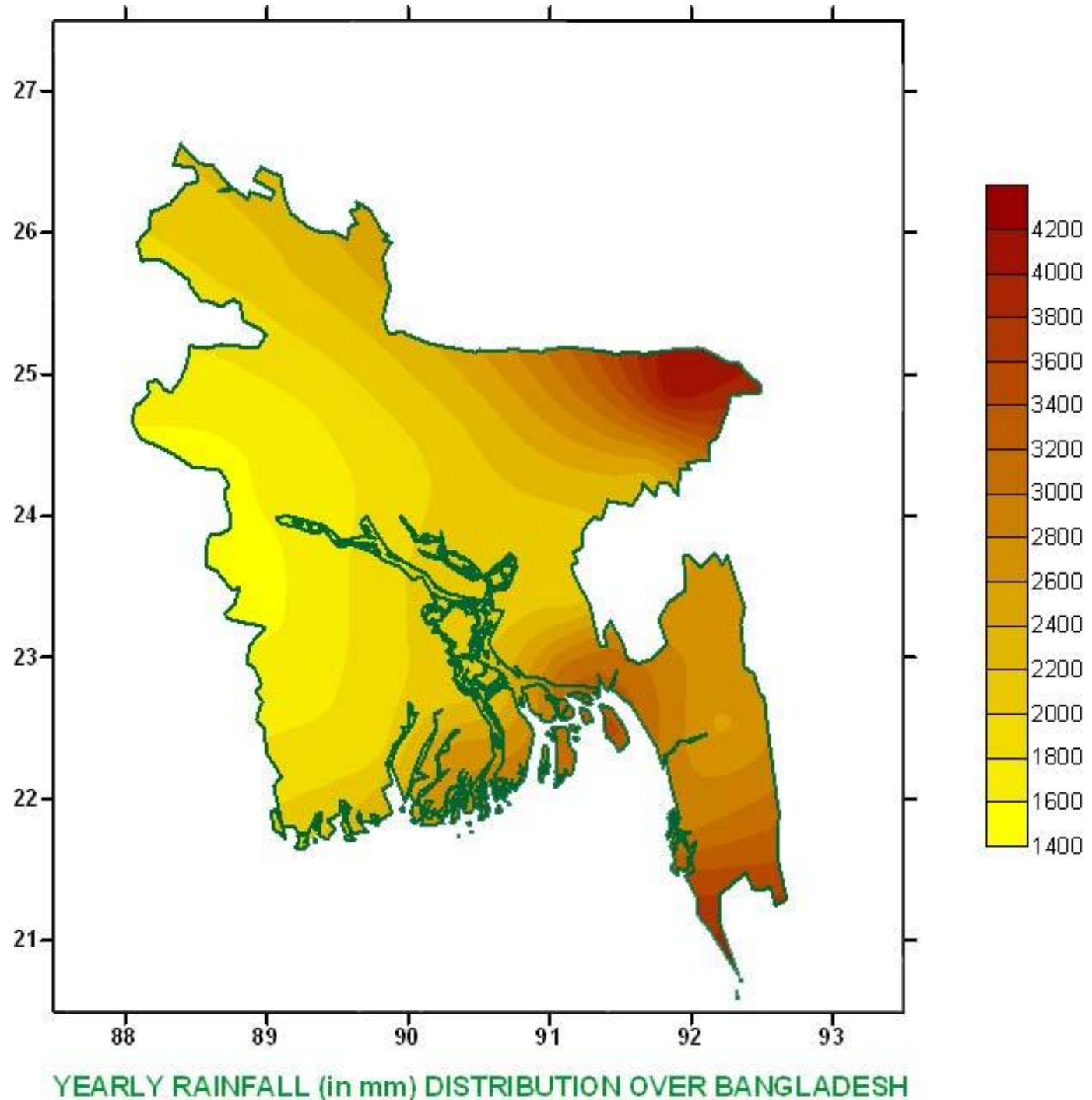
Types of flood

- 1 River Flood
- 2 Flash Flood
- 3 Rain-fed Flood
- 4 Tidal Flood due to Storm Surges



Flood types in Bangladesh

**Southeastern,
Eastern and
Northeastern
area are the
Heavy Rainfall
zone of
Bangladesh**



DROUGHT (WMO 1992 N°182):

- (1) Prolonged absence or marked deficiency of precipitation
- (2) Period of abnormally dry weather sufficiently prolonged for the lack of precipitation to cause a serious hydrological imbalance

DRY SEASONS

Period of year characterized by almost complete absence of rainfall. The term is mainly used for low latitude regions.

DRY SPELL

Period of abnormally dry weather. Use of them should be confined to conditions less severe those of a drought.

Historical Drought Occurrences in Bangladesh

SEVERE

1966, 1969, 1972

1978, 1979, 1982

1989, 1992, 1994,

1995, 1998

MODERATE

1961, 1962

1967, 1968

1970, 1977, 2002

About 2.18 million tons of rice was damaged due to drought during the period 1973-87

ATMOSPHERIC DROUGHT

“too high saturation deficit”

METEOROLOGICAL DROUGHT

“a longer period of time with considerably less than average precipitation amounts”

AGRICULTURAL DROUGHT

“available soil moisture is inadequate“ yield is considerably less than the average because of water shortage”

HYDROLOGICAL DROUGHT

“refers to a period of below-normal stream- flow”

PHYSIOLOGICAL DROUGHT

“plant is unable to take up water in spite of the present sufficient soil moisture”

SOCIOECONOMIC DROUGHT

supply and demand of some economic good with elements of met, hydrological, and agricultural drought

Approaches

Drought index „an index which is related to some of the cumulative effects of a prolonged and abnormal moisture deficit”

- (1) Precipitation anomaly
- (2) Atmospheric drought
- (3) Aridity „aridity – characteristic of climate relating to insufficiency or inadequacy of precipitation to maintain vegetation”
- (4) Soil moisture
- (5) Combined or recursive
- (6) Remotely sensed information

(1) Precipitation anomaly indices

Precipitation index

Relative precipitation sum

Relative anomaly

Standardized anomaly index, SAI

Average standard anomaly

(2) Atmospheric drought

Saturation deficit

(3) Aridity index potential evaporation precipitation

Lang's rainfall index

De Martonne aridity index

Ped's Drought index [PDI1]

Selyaninov's hydrothermal coefficient

Thornthwaite Index

Potential water deficit

Potential evaporation ratio, reciprocal of aridity index

Aridity index, moisture availability index

Relative evaporation

(Surface energy balance)

Bowen ratio

(4) Soil moisture index

Relative soil moisture index

Ped's Drought index [PDI2]

(5) Combined or recursive

Fooley anomaly index (FAI)

Bhalme-Mooley drought index (BMDI)

Palmer Drought Severity Index, PDSI

**The other indices form the PDSI index family

Standardized Precipitation Index, SPI

Surface Water Supply Index, SWSI

Reclamation Drought Index, RDI

Palmer Drought Index, PDI

Palmer Crop Moisture Index, CMI

Keetch-Byram Drought Index, KBDI

(6) Remotely sensed information

Crop water stress index

Vegetation index

Normalised Difference Vegetation Index

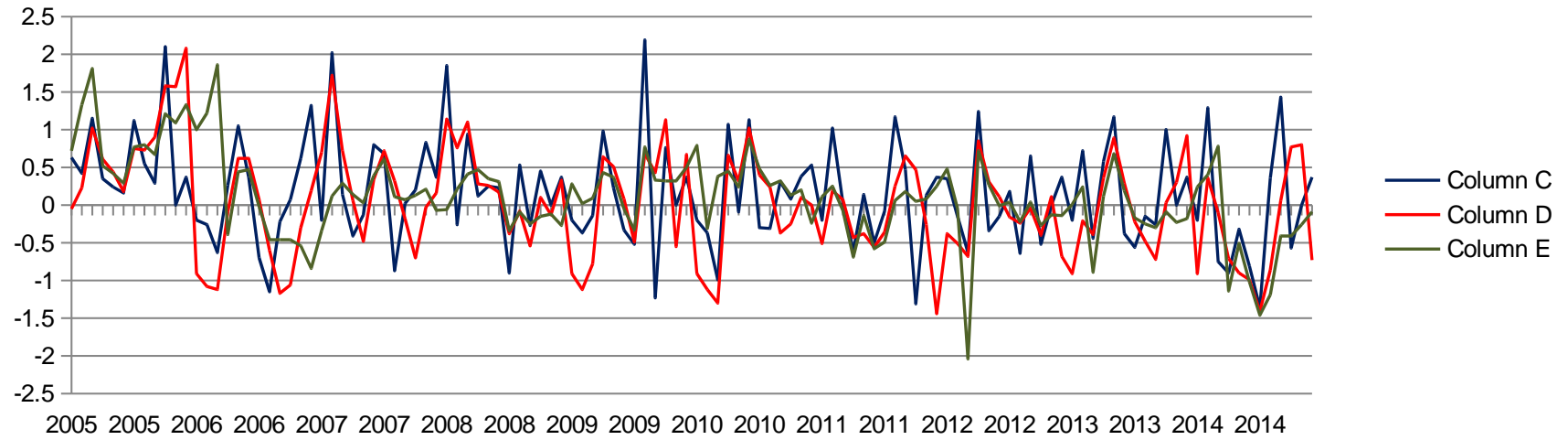
Stress degree day

Status of Drought Monitoring in Bangladesh

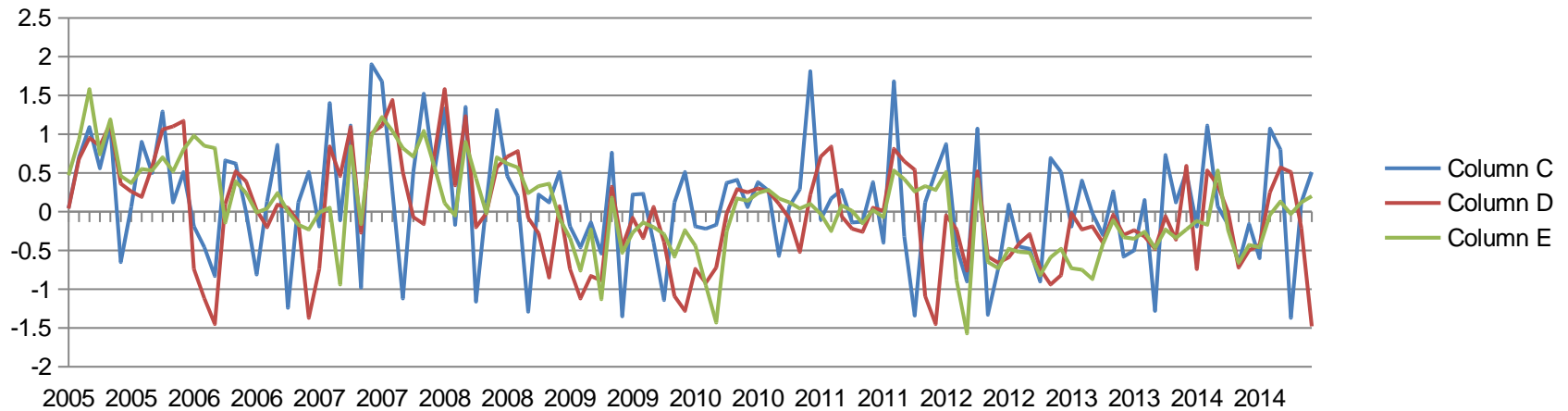
There is no continuous Drought Monitoring system in Bangladesh.

BMD is working to start issuing SPI in different scales very soon (maps & graphs).

Rangpur



Mymensingh



Common misunderstanding

Aridity

Scarcity of water

Usability and/or availability of water