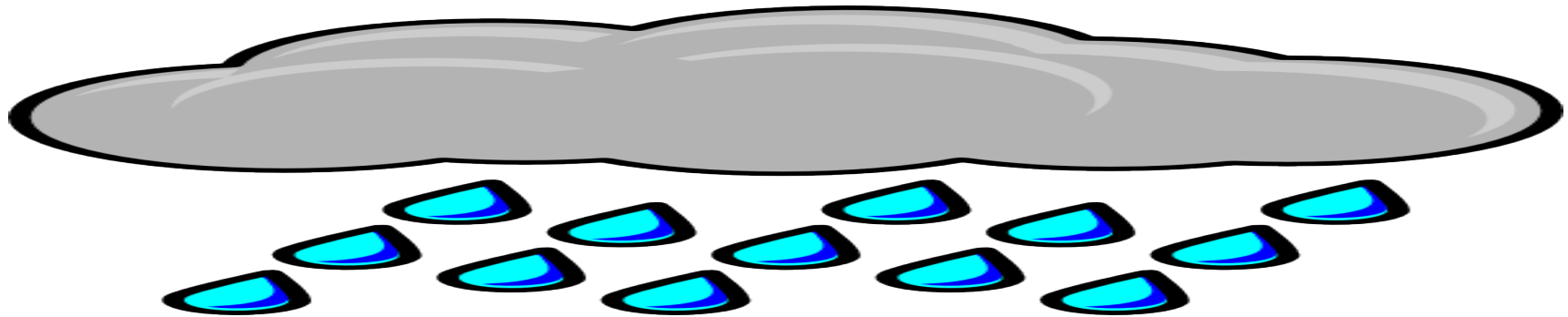


# **1(b). Basic aspect of rainfall and their application in crop production**

**(Dr. T.N. Balasubramanian)**



\*Rainfall is the total liquid product of precipitation or condensation from the atmosphere as received and measured through rain gauge over 24 hours

\*Precipitation is the deposition of atmospheric moisture on the ground in the form of rainfall, drizzle, snow fall and hail.

\*This rainfall is the prime water source for all living beings in the earth surface

# Rainfall Theories and Processes

## Theories:

- Bergeron ice crystal theory-cold clouds
- Collision theory-Warm clouds

## Processes

- Convective rainfall process
- Orographic process
- Warm frontal rain
- Cold frontal rain
- Rain with cyclone formation

# Annual rainfall of important countries(HJ.Critchfield,2003)

Country	Annual rainfall(mm)
Algiers-Algeria(Africa)	691
Addis Ababa-Ethiopia(Africa)	1110
Bangkok-Thailand(Asia)	1492
Ankara-Turkey(Asia)	360
Trivandrum-India(Asia)	1835
Brisbane-Queensland(Australia & New Zealand)	1092
Invercargill-New Zealand(Australia & New Zealand)	1063
Berlin_-Germany(Europe)	605
London-England(Europe)	583
Mazatlan-Mexico(North America)	805
Manaus-Brazil(South America)	2095

# Facts on Rainfall

- Droplet size:  $> 0.5\text{mm}$
- Rainy day: rainfall  $> 2.5\text{mm}$

## Rainfall intensity

- Very heavy : Rainfall  $> 12.5\text{cm}$
- Heavy:  $6.5$  to  $12.5\text{cm}$
- Rather heavy:  $3.5$  to  $6.5\text{cm}$
- Moderate:  $0.8$  to  $3.5\text{cm}$
- Light rain:  $0.3$  to  $0.7\text{cm}$
- Very light rain: up to  $0.2\text{cm}$

# Rainfall and Crop Production

- Effective rainfall- rainfall & soil interaction- and this is the available soil moisture for crops(60% as per thumb rule based on antecedent soil moisture)
- Dry land agriculture
- Irrigated agriculture
- Crop water requirement(ET) and crops yield are related

# Water Requirement of crops(mm)

Crop	ET(mm)	Crop	ET(mm)
Rice	1200-1400	Maize	500-600
Sorghum	400-550	Wheat	450-550
Finger Millet	450-550	Pulses	250-300
Groundnut	600-650	Sunflower	400-500
Cotton	600-850	Sugarcane	2250-2500
Banana	1650-2250	Tomato	600-900
Wheat	350-550		

# Instruments used for measuring rainfall

- At the international level rainfall has to be measured by 3 GMT / UTC
- Ordinary rain-gauge
- Self recording rain-gauge
- Dipping bucket