

VARIATIONS IN MOISTURE REGIME AT SELECTED HUMID STATIONS OVER INDIA

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INTRODUCTION

- ❑ Year-to-year fluctuations in water balance parameters reveal shifts in the normal climatic type of a particular location
- ❑ Temporary deviation from normal water balance of a location lead to water abundance or shortage and it is common in all climates
- ❑ Rate of recurrence of such shortage or excess determines the dependability of a locality for agricultural production
- ❑ The occurrence of droughts in humid climates is not as frequent as semi-arid / arid climates
- ❑ But, sporadic changes in annual water balance in humid climates can shift the climatic type towards wetter or drier side
- ❑ The values of moisture index are the good indicators for moisture status of a location

- ❖ **Weekly rainfall and pan evaporation data has been collected for the four stations under study viz., Palampur, Ranichuari, Samastipur and Mohanpur**
- ❖ **Pan evaporation values is multiplied by Pan co-efficient value (0.75) to get Potential Evapotranspiration (FAO Irrigation and Drainage paper No. 24)**
- ❖ **Initial soil moisture and soil water holding capacity values were collected from NBSS & LUP Publication (Mandal et.al., 1999)**
- ❖ **Weekly water balance was calculated by Thornthwaite & Mather (1955) method**
- ❖ **Moisture Index (Im) values was determined by Carter and Mather (1966) method**

Humidity Index (Ih) = Water Surplus / PET

Aridity Index (Ia) = Water Deficit / PET

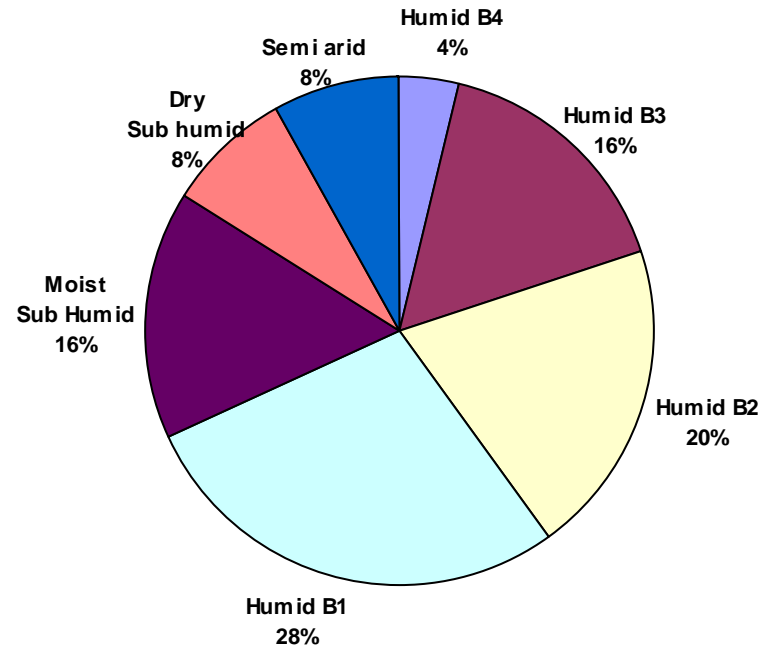
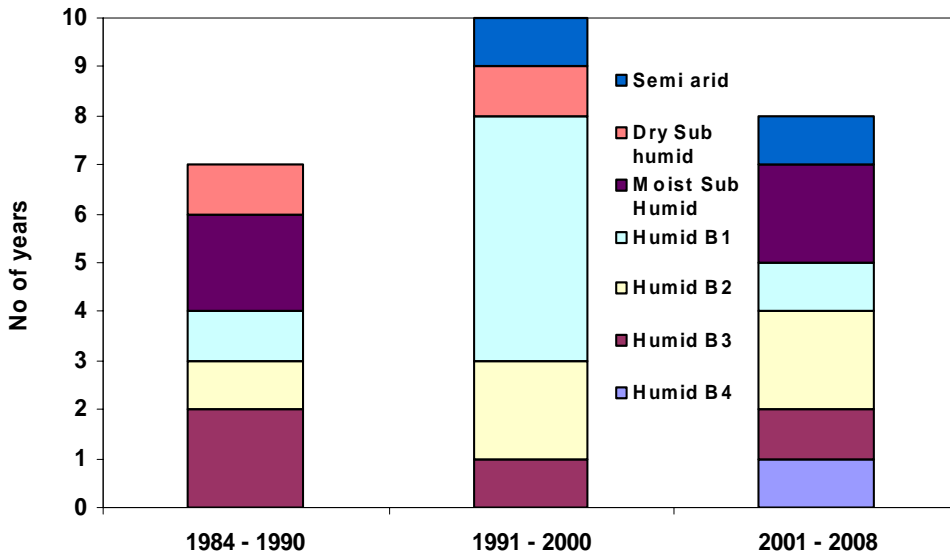
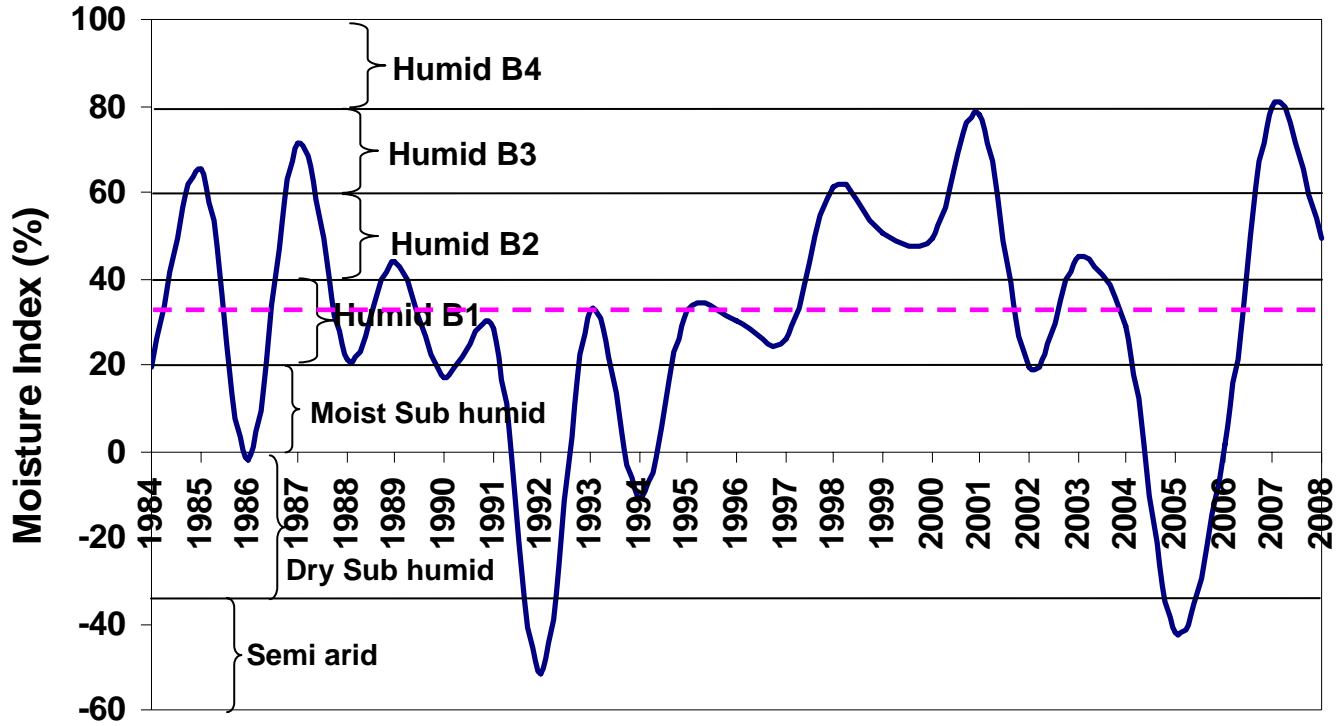
Moisture Index (Im) = Ih - Ia

Classification of climatic types according to the moisture index (Thornthwaite & Mather, 1955)

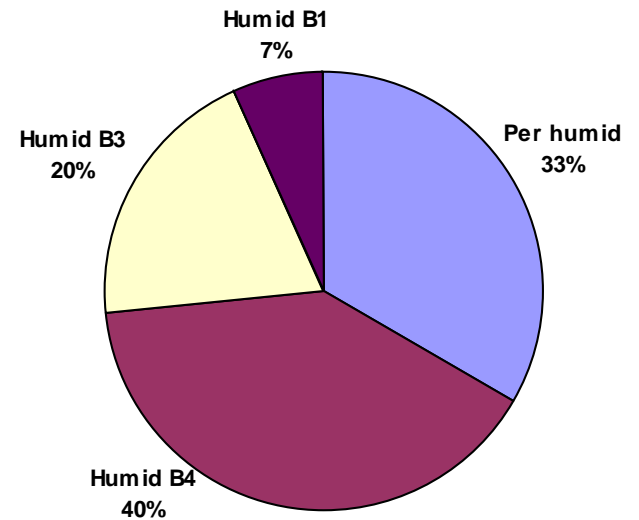
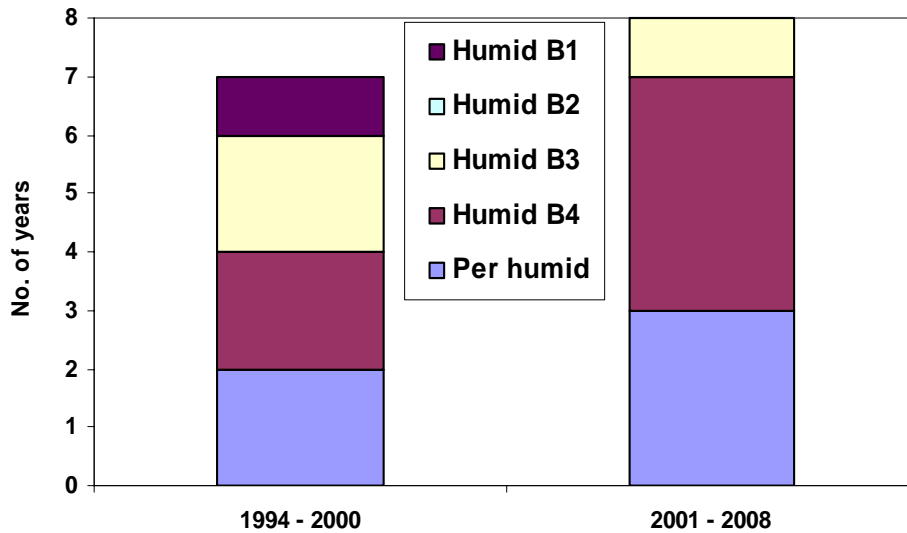
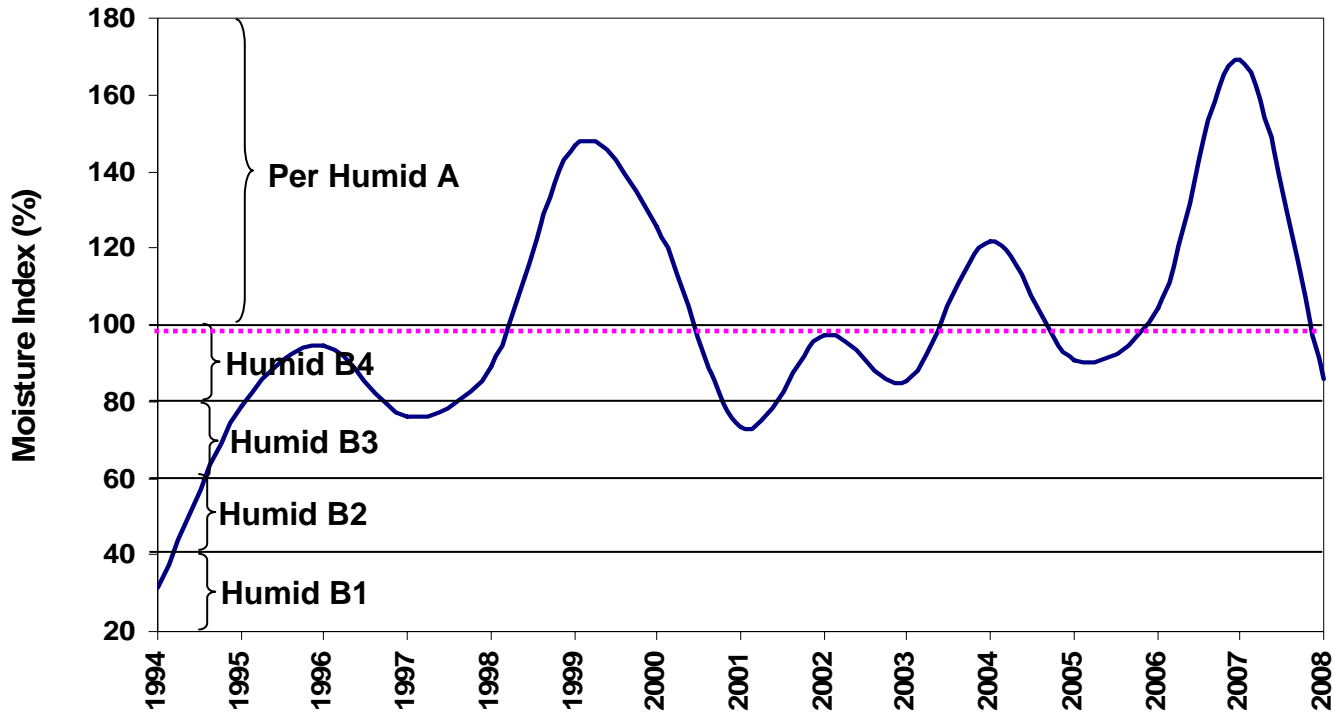
Moisture Index Im (%)	Climate type (Symbol)
Above 100	Perhumid (A)
100 – 80	Humid (B4)
80 – 60	Humid (B3)
60 – 40	Humid (B2)
40 – 20	Humid (B1)
0 – 20	Moist subhumid (C2)
0 to –33.3	Dry subhumid (C1)
-33.3 to - 66.7	Semi-arid (D)
Less than –66.7	Arid (E)

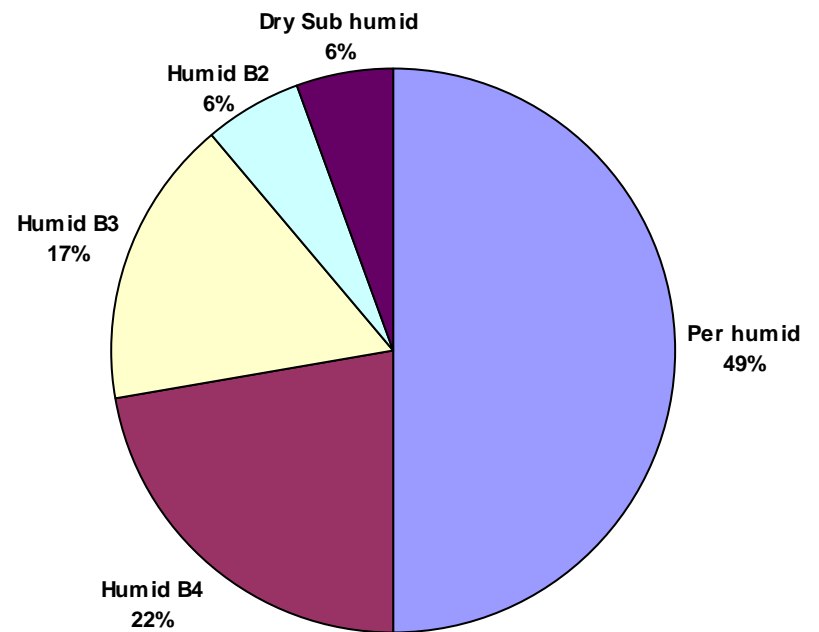
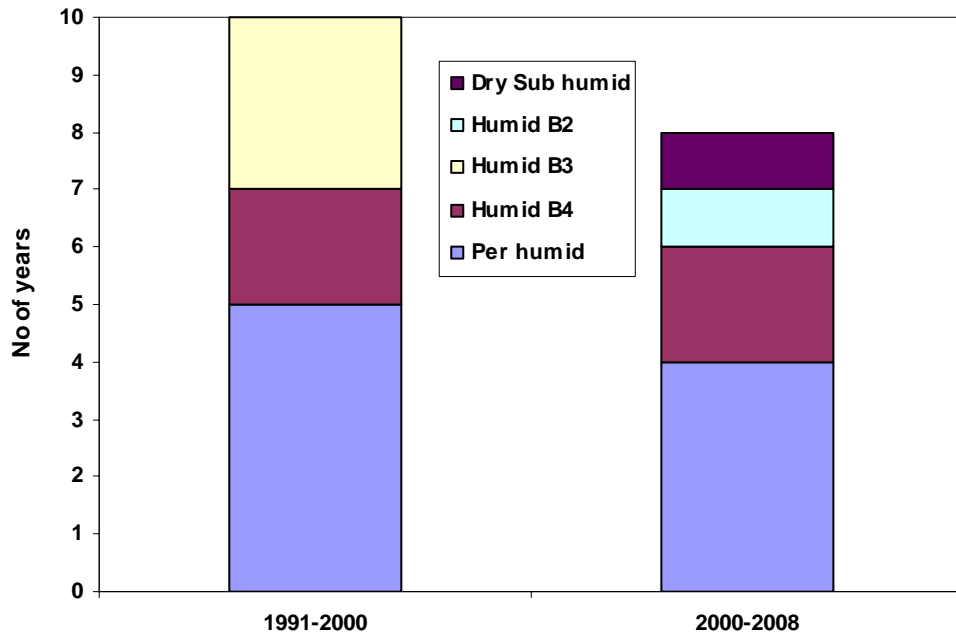
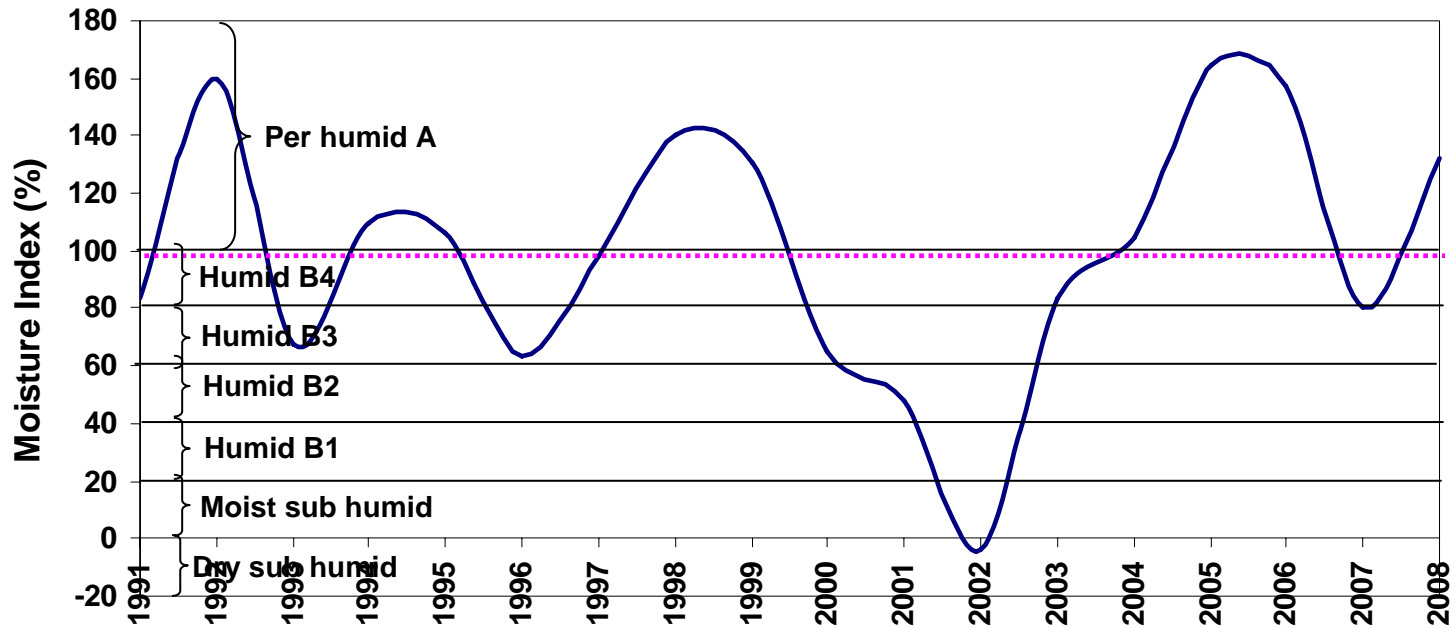
Results

Samastipur

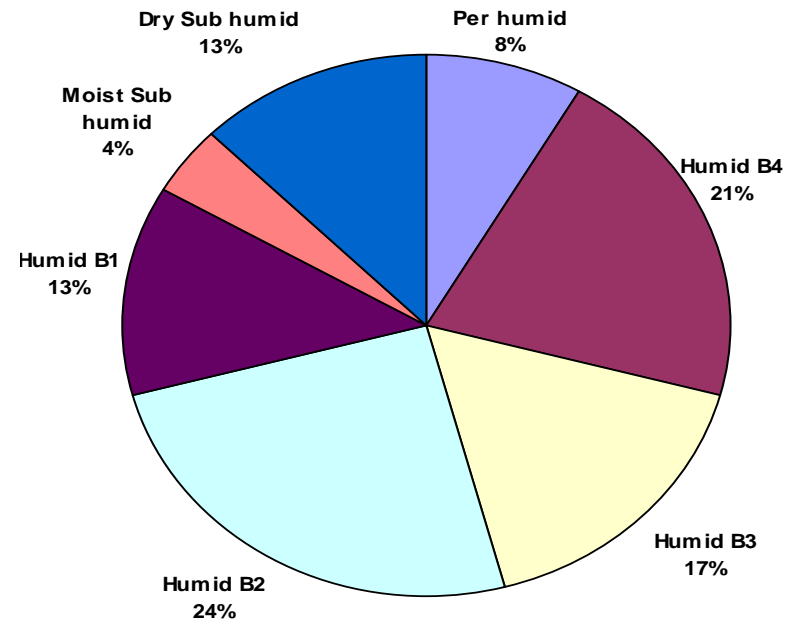
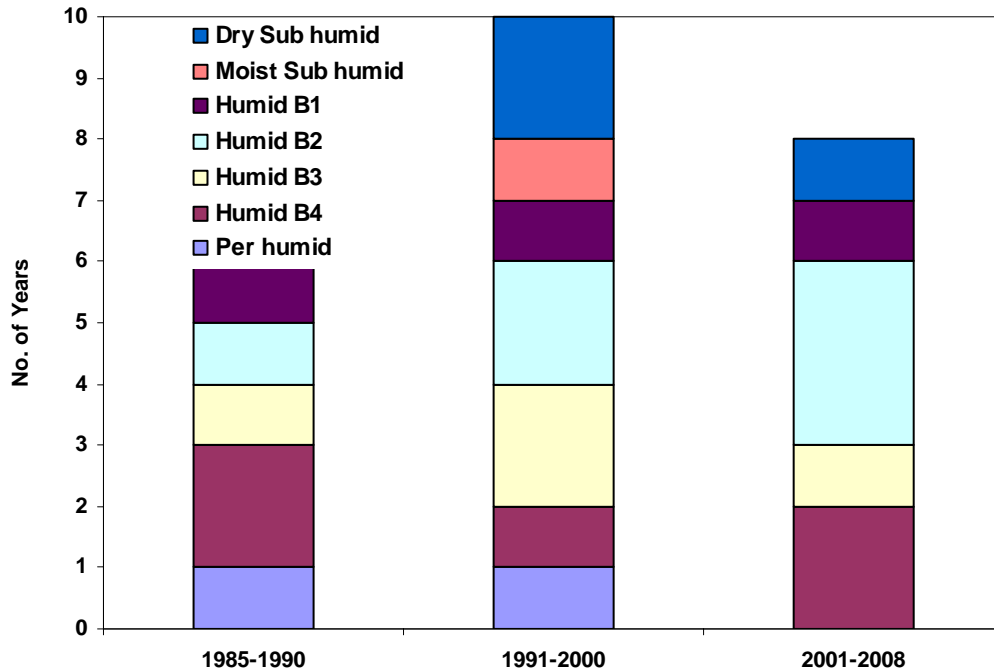
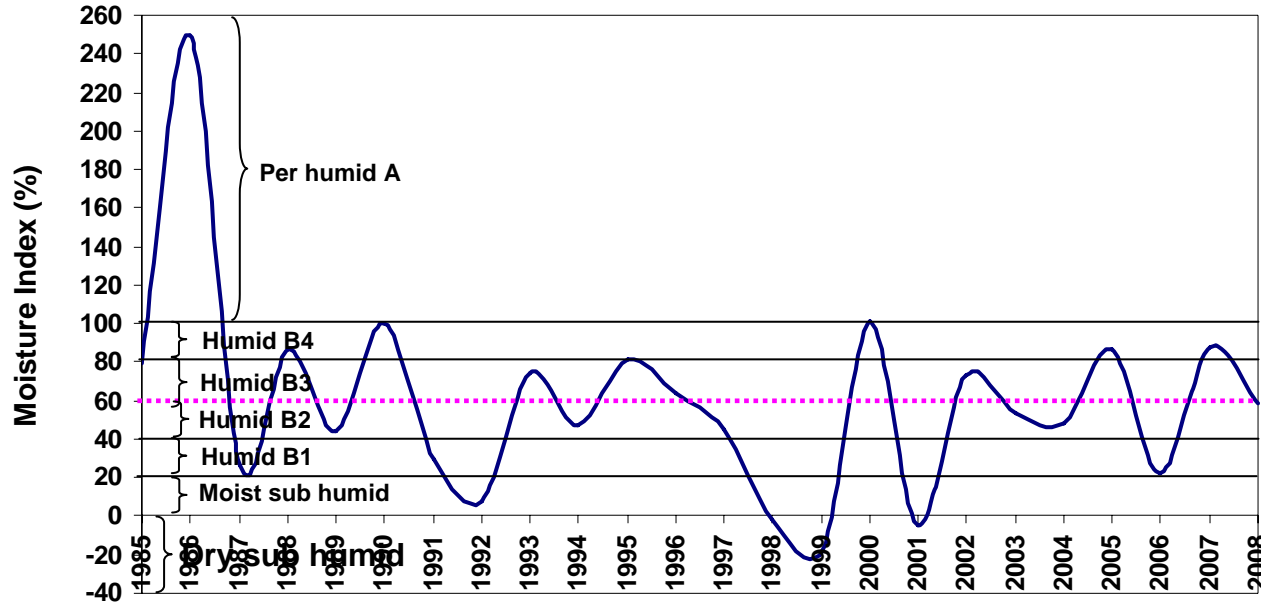


Mohanpur





Ranichuari



Palampur (18 years)

Decade	Per humid	Humid B4	Humid B3	Humid B2	Dry Sub humid
1991 - 2000	5	2	3	0	0
2000 - 2008	4	2	0	1	1
Total	9	4	3	1	1
	Towards wetness – 9 times (50 %)			Towards dryness – 4 times (22 %)	

Mohanpur (15 years)

Decade	Per humid	Humid B4	Humid B3	Humid B2	Humid B1
1994 - 2000	2	2	2	0	1
2001 - 2008	3	4	1	0	0
Total	5	6	3	0	1
	Towards wetness – 5 times (33%)			Towards dryness – 4 times (27 %)	

Ranichuari (24 years)

Decade	Per humid	Humid B4	Humid B3	Humid B2	Humid B1	Moist Sub humid	Dry Sub humid
1985 - 1990	1	2	1	1	1	0	0
1991 - 2000	1	1	2	2	1	1	2
2001 - 2008	0	2	1	3	1	0	1
Total	2	5	4	6	3	1	3
	Towards wetness – 7 times (29%)			Towards dryness – 13 times (54 %)			

Samastipur (25 years)

Decade	Humid B4	Humid B3	Humid B2	Humid B1	Moist Sub Humid	Dry Sub humid	Semi-arid
1984 - 1990	0	2	1	1	2	1	0
1991 - 2000	0	1	2	5	0	1	1
2001 - 2008	1	1	2	1	2	0	1
Total	1	4	5	7	4	2	2
	Towards wetness – 10 times (40%)				Towards dryness – 8 times (32%)		

Conclusions

- ✓ Year-to-year fluctuations in moisture index values found more at Samastipur and Ranichuari and less at Mohanpur and Palampur
- ✓ Percentage shifts towards wetter climate are higher at Palampur (50%) and Samstipur (40%)
- ✓ Percentage shifts towards drier climate are more at Ranichuri (54%) and Samastipur (32%)
- ✓ The results indicates Ranichuari is vulnerable for frequent shifts towards drier climate followed by Samastipur



THANK YOU