# IMPACT OF CLIMATE CHANGE ON WATER RESOURCES IN ARID AND SEMI-ARID REGIONS OF RAJASTHAN- CHALLENGES FOR BIODIVERSITY CONSERVATION

Dr. M. S. RATHORE

DIRECTOR, CENTRE FOR ENVIRONMENT AND DEVELOPMENT STUDIES, JAIPR

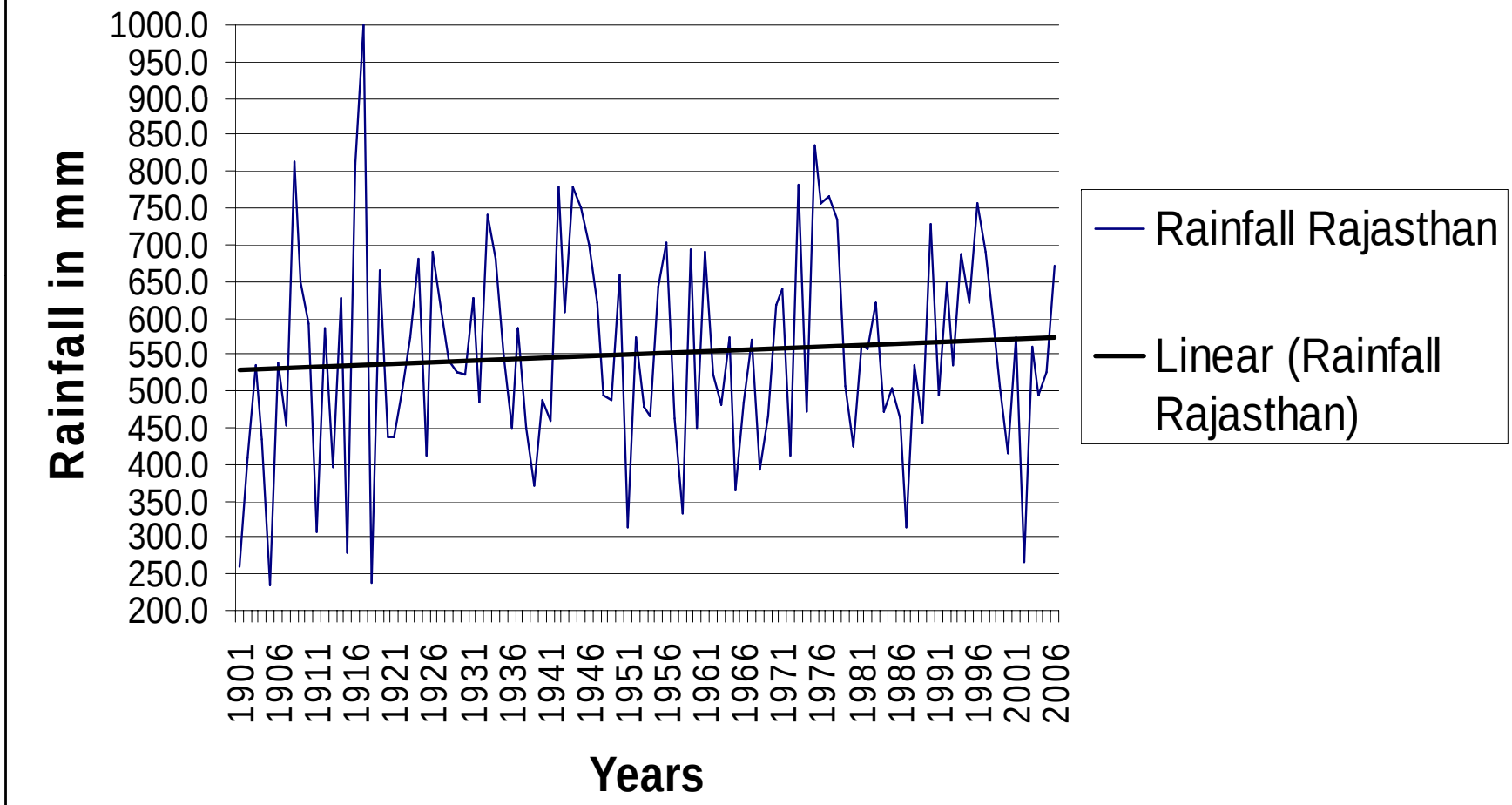
# CLIMATE CHANGE - RAJASTHAN

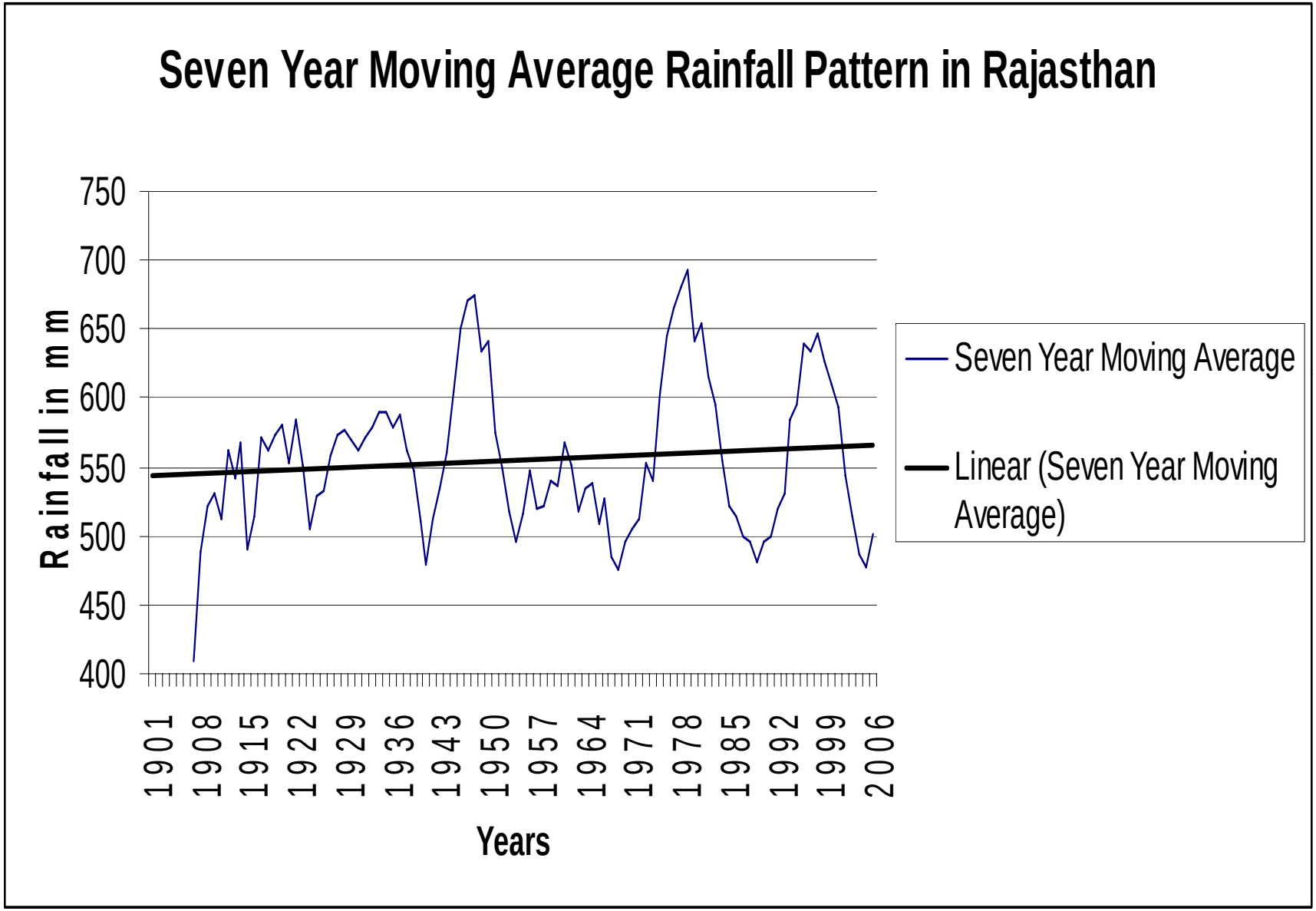
- CLIMATE VARIABILITY /CHANGE
- LANDUSE AND BIODIVERSITY
- IMPACT OF CLIMATE CHANGE
  - WATER
  - BIOMASS
  - LIVESTOCK
  - AGRICULTURE

# CLIMATE VARIABILITY/CHANGE

- RAINFALL VARIABILITY AFFECTING ALL ASPECTS OF LIFE
  - NATURE OF RAINFALL AND BIODIVERSITY

# Yearly Rainfall Pattern in Rajasthan

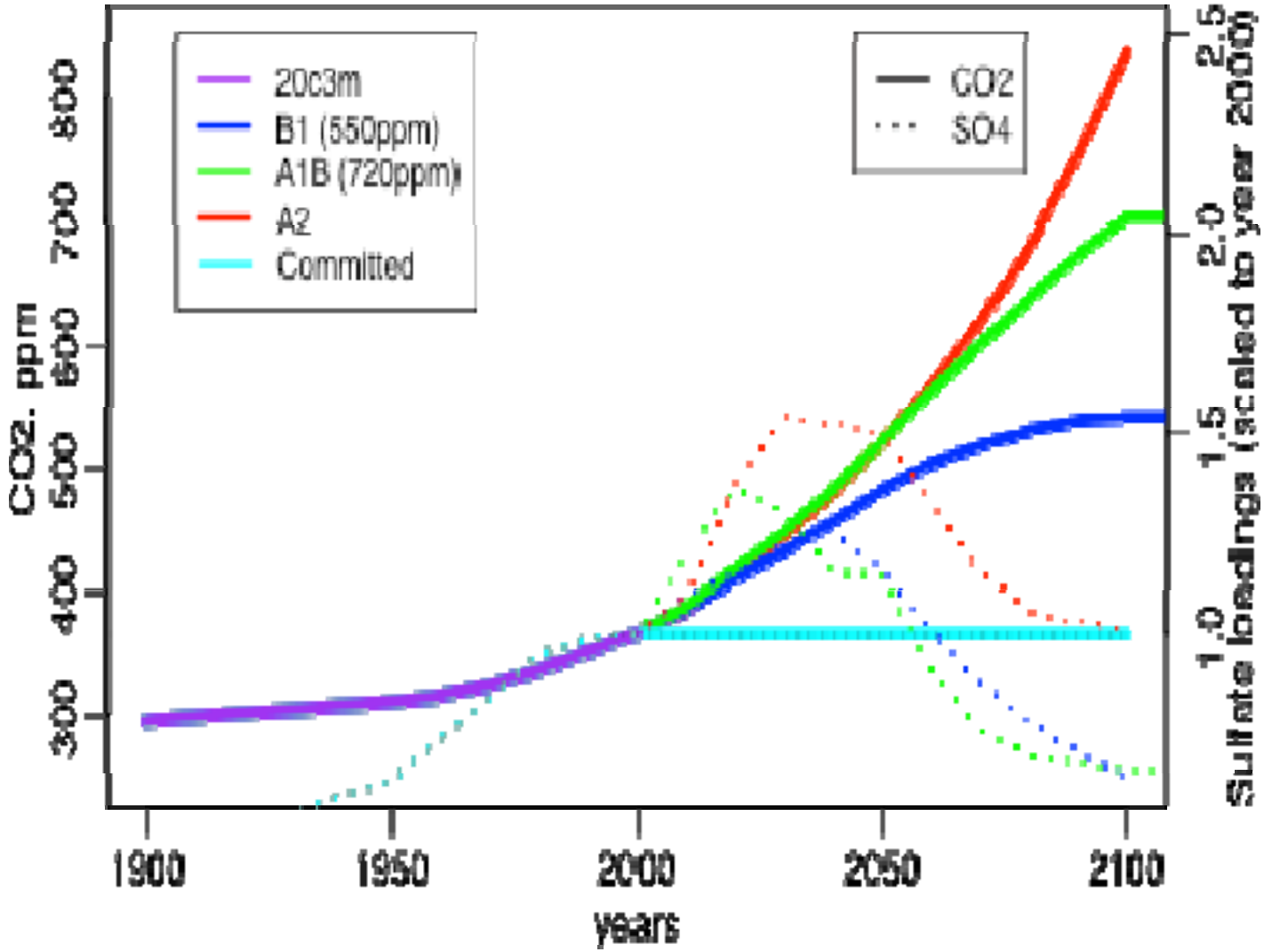



Seven Year Moving Average Rainfall Pattern in Rajasthan
750
700
650
600
550
500
450
400
Rainfall in mm
1901
1908
1915
1922
1929
1936
1943
1950
1957
1964
1971
1978
1985
1992
1999
2006
Years
Seven Year Moving Average
Linear (Seven Year Moving Average)

# Status of Ground Water in Rajasthan

| No of Blocks in Category | 1984 | 1988 | 2001 | 2008 |
|---|---|---|---|---|
| Over-Exploited (>100%) | 12 (5%) | 41 (17%) | 86 (36%) | 164 (69%) |
| Critical (90 to 100%) | 11 (5%) | 26 (11%) | 80 (34%) | 34 (14%) |
| Semi Critical (70 to 90%) | 10 (4%) | 34 (14%) | 21 (9%) | 8 (3%) |
| Safe (<70%) | 203 (86%) | 135 (57%) | 49 (21%) | 13 (14%) |

*Total number of Blocks in the State: 237; one block Taranagar in Churu district is completely saline and hence not considered in the CGWB studies. Thus the above table is with respect to 236 blocks only*




Common SRES emission scenarios (Source: Environment Canada 2011).

•The downscaling efforts using output from two GCMs – ECHAM5 and CGCM3 – under two emission scenarios – A1B and A2 – indicate the high likelihood that monsoon and annual rainfall might decrease.

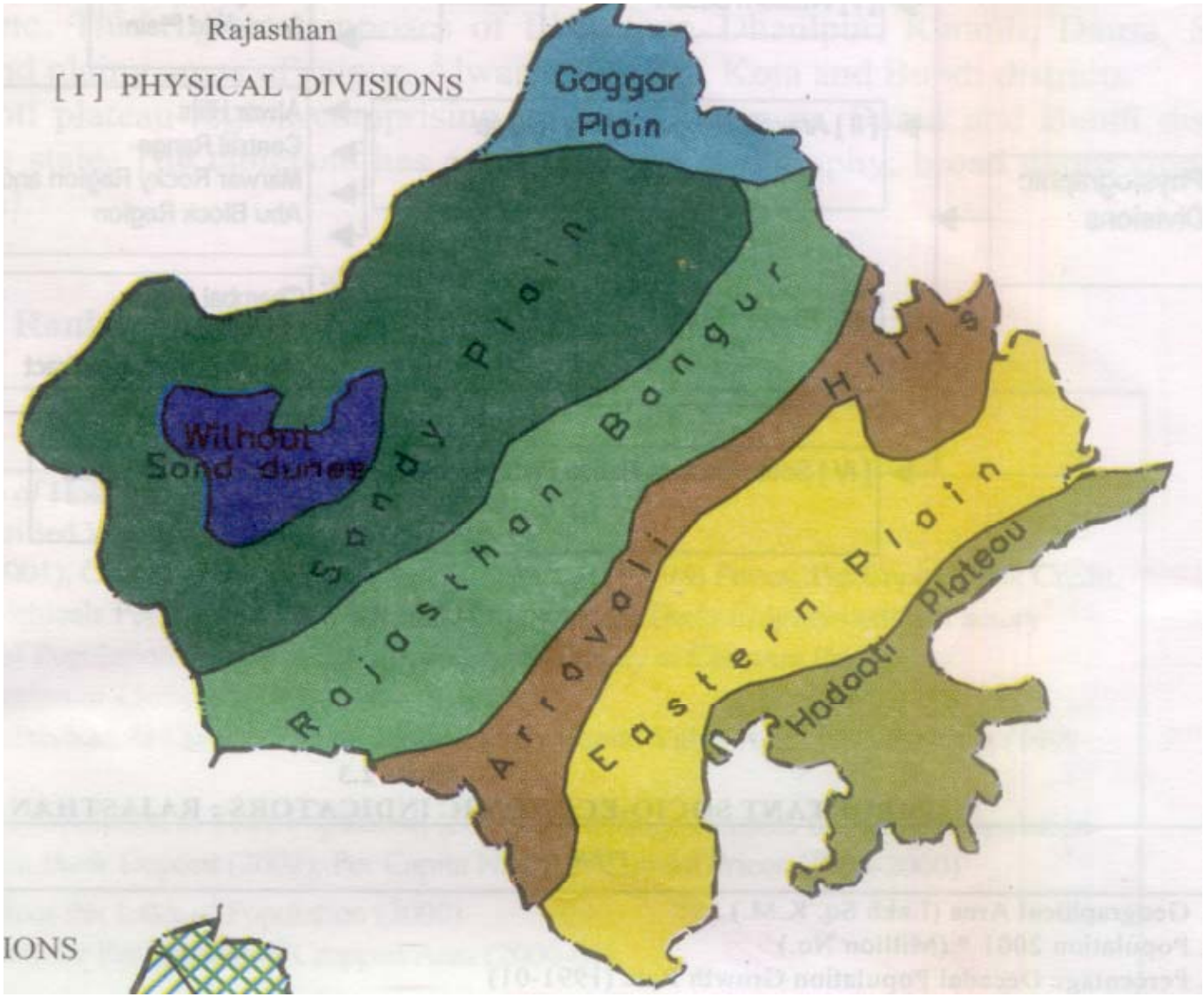
•The rainfall projections generated from multiple GCMs are in agreement about the downward trend in rainfalls in all seasons except for the post-monsoon period of October-November.

• Also, all of the rainfall projections indicate a greater tendency toward rainfall extremes, with a higher likelihood of drought years and a slightly higher chance of very wet monsoons, when compared with the historical period of 1948-2008.

•Seasonal rainfall patterns also appear to be shifting in the rainfall projections, with a greater proportion of the monsoon rainfall happening in August and September than in the past.

•This indicates the possibility of a delay in the onset of the monsoon from the beginning of July to mid/late July. Likewise, more rain is projected for October, signifying that the monsoon might last later than in the past.

# Rajasthan

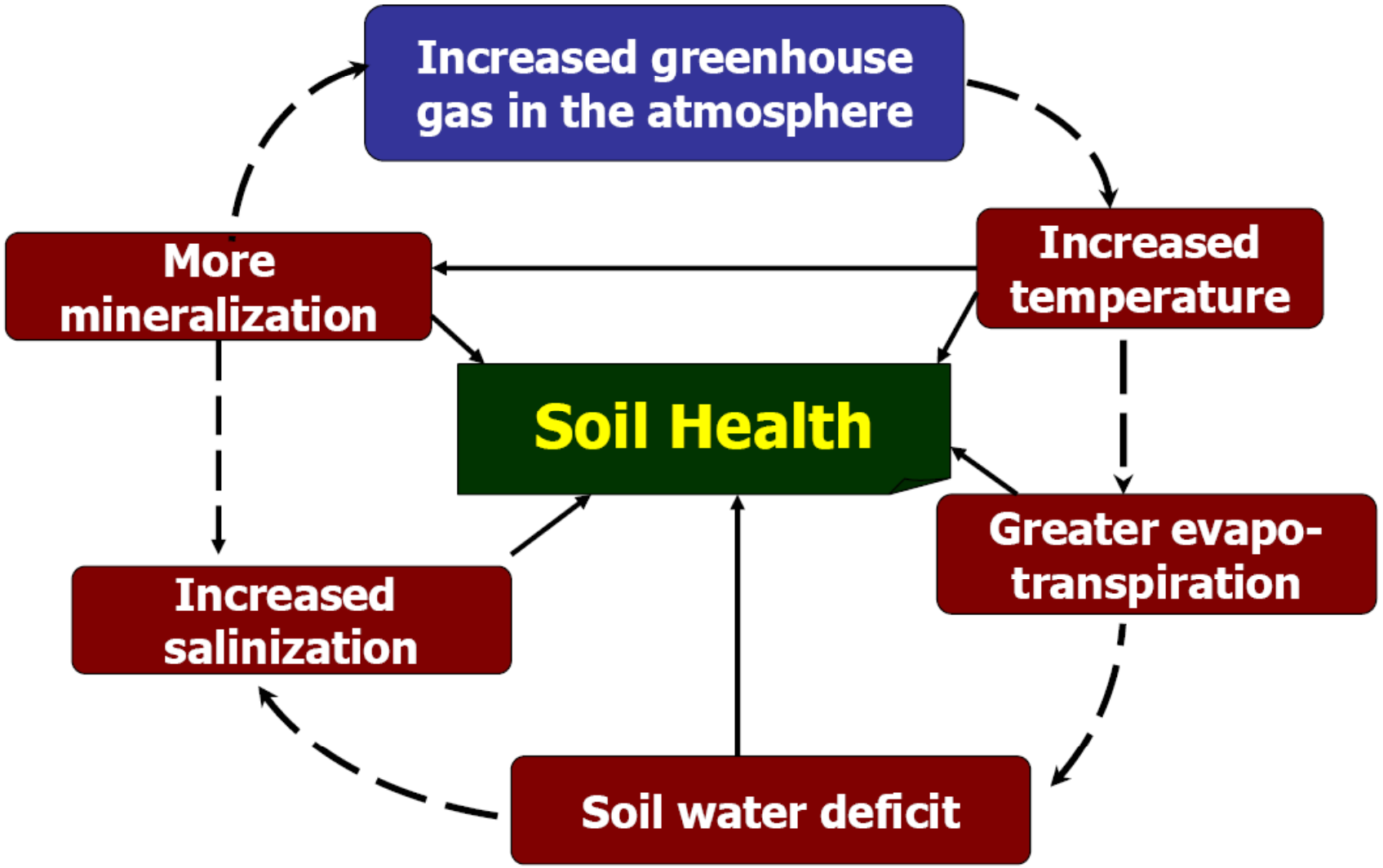

Rajasthan
[I] PHYSICAL DIVISIONS
Gaggar Plain
Sandy Plain
Without Sand dunes
Rajasthan Bangur
Aravalli Hills
Eastern Plain
Hadoati Plateau
IONS

# LANDUSE AND BIODIVERSITY

- LANDUSE POLICIES AND BIODIVERSITY
- AGRICULTURE POLICY
- LIVESTOCK POLICY
- FOREST POLICY
- RAJASTHAN ACTION PLAN ON CLIMATE CHANGE

| **Rajasthan** | Area (000' Hectare) | | Percentage Share | |
|---|---|---|---|---|
| | **1971** | **2010** | **1971** | **2010** |
| 1.Geographical Area according to Village papers | 34109 | 34270 | 100.0 | 100.0 |
| 2. Forest | 1355 | 2735 | 4.0 | 8.0 |
| 3. Not available for Cultivation | | | | |
| (A) Land put to non agricultural use | 1162 | 1976 | 3.4 | 5.8 |
| (B )Barren & uncultivated | 4716 | 2292 | 13.8 | 6.7 |
| Total (A+B) | 5878 | 4268 | 17.2 | 12.5 |
| 4. Other uncultivated excluding fallow land | | | | |
| (C) Permanent pasture & other grazing land | 1807 | 1697 | 5.3 | 5.0 |
| (D) Land under misc. tree crops & groves not included in net area sown | 9 | 17 | 0.0 | 0.1 |
| (E) Culturable waste | 6112 | 4475 | 17.9 | 13.1 |
| Total (C+D+E) | 7928 | 6190 | 23.2 | 18.1 |
| 5. Fallow land | | | | |
| (F ) Old fallow land | 2326 | 2048 | 6.8 | 6.0 |
| (G) Current fallow land | 1443 | 2055 | 4.2 | 6.0 |
| Total (F+G) | 3769 | 4103 | 11.0 | 12.0 |
| 6. Net area sown | 15179 | 16974 | 44.5 | 49.5 |
| 7. Total Cropped Area | 16729 | 21745 | | |
| 8. Area sown more than once | 1550 | 4771 | | |

# Impact of climate change on soil health



# THANKS