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Use of climate projection data to assess future vulnerability to develop adaptation plan

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Climate Projections at regional level

CMIP-5
Spatial Resolution
(2.5*2.5 °)
20 Modeling group
4 GHG Emission
Scenarios

?

Fine spatial
resolution
data

Adaptation
planning at
Regional level
(Block level or
District level

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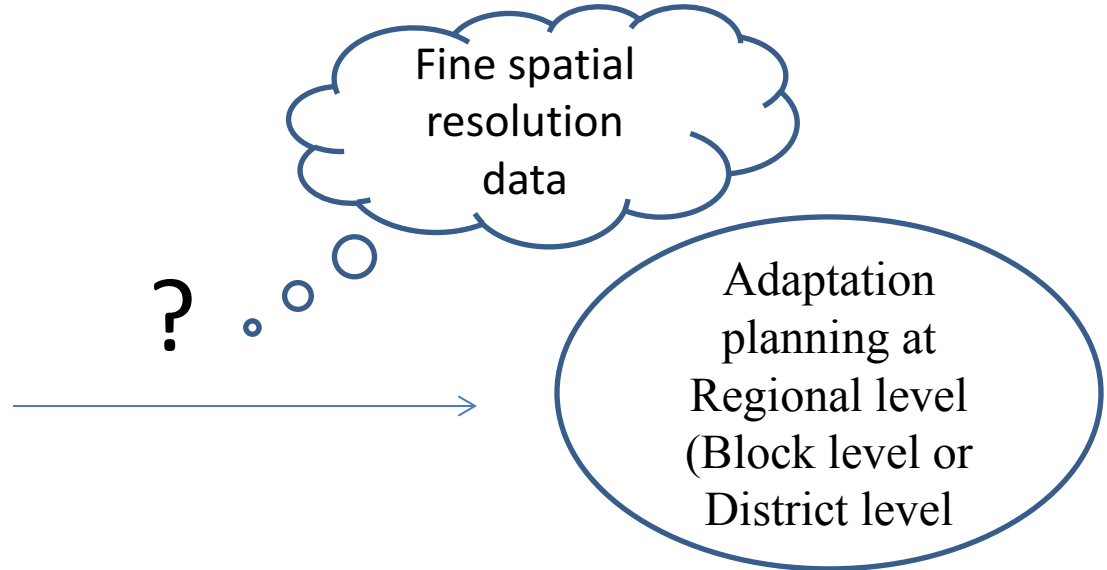
Fine Spatial Resolution Data

How to get…

- Run (General circulation model) GCM at a finer resolution
- Downscale the data
- Run a Regional climate model (RCM)

4

Projected climate data at regional level

- From application point of view, two sources of data accessed:

  – CORDEX South Asia data (0.5×0.5°)
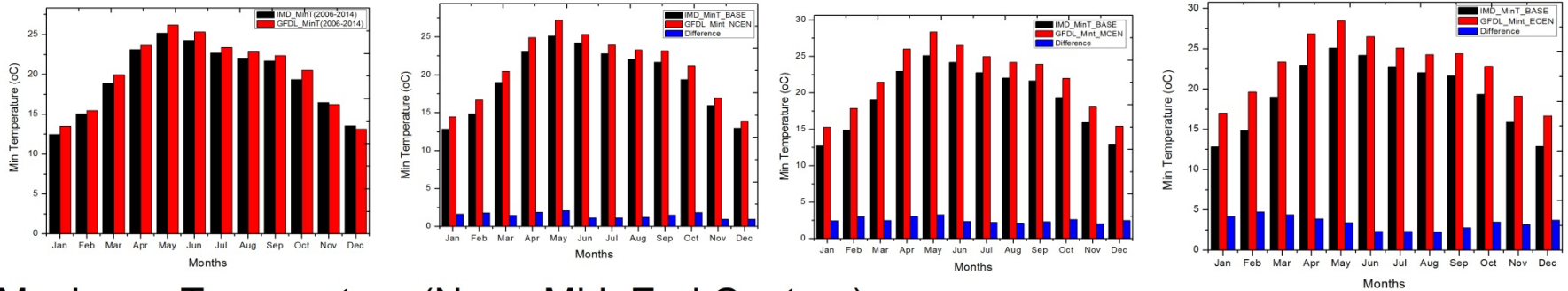 – NEX-GDDP (0.25×0.25°)

NEX-GDDP Data Analysis – Case of Bhokardhan block in Jalna district

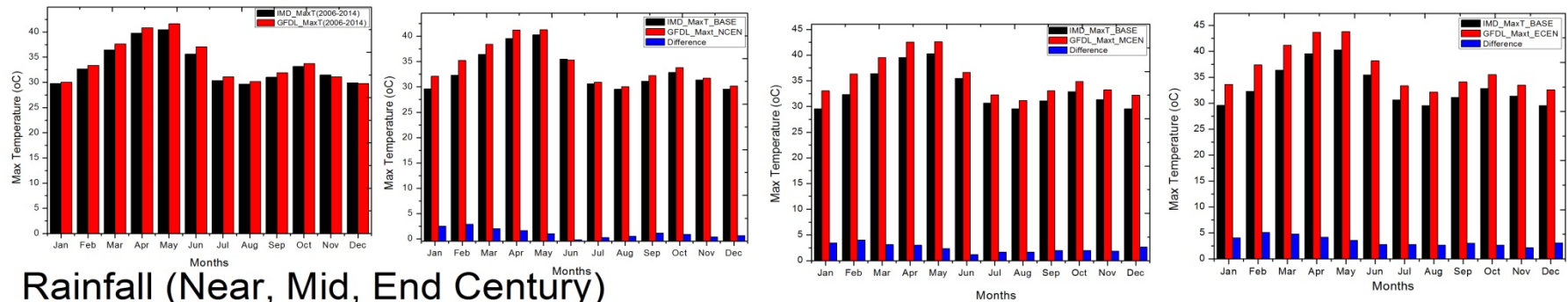Comparison of Rainfall data for Bhokardhan block in Jalna district
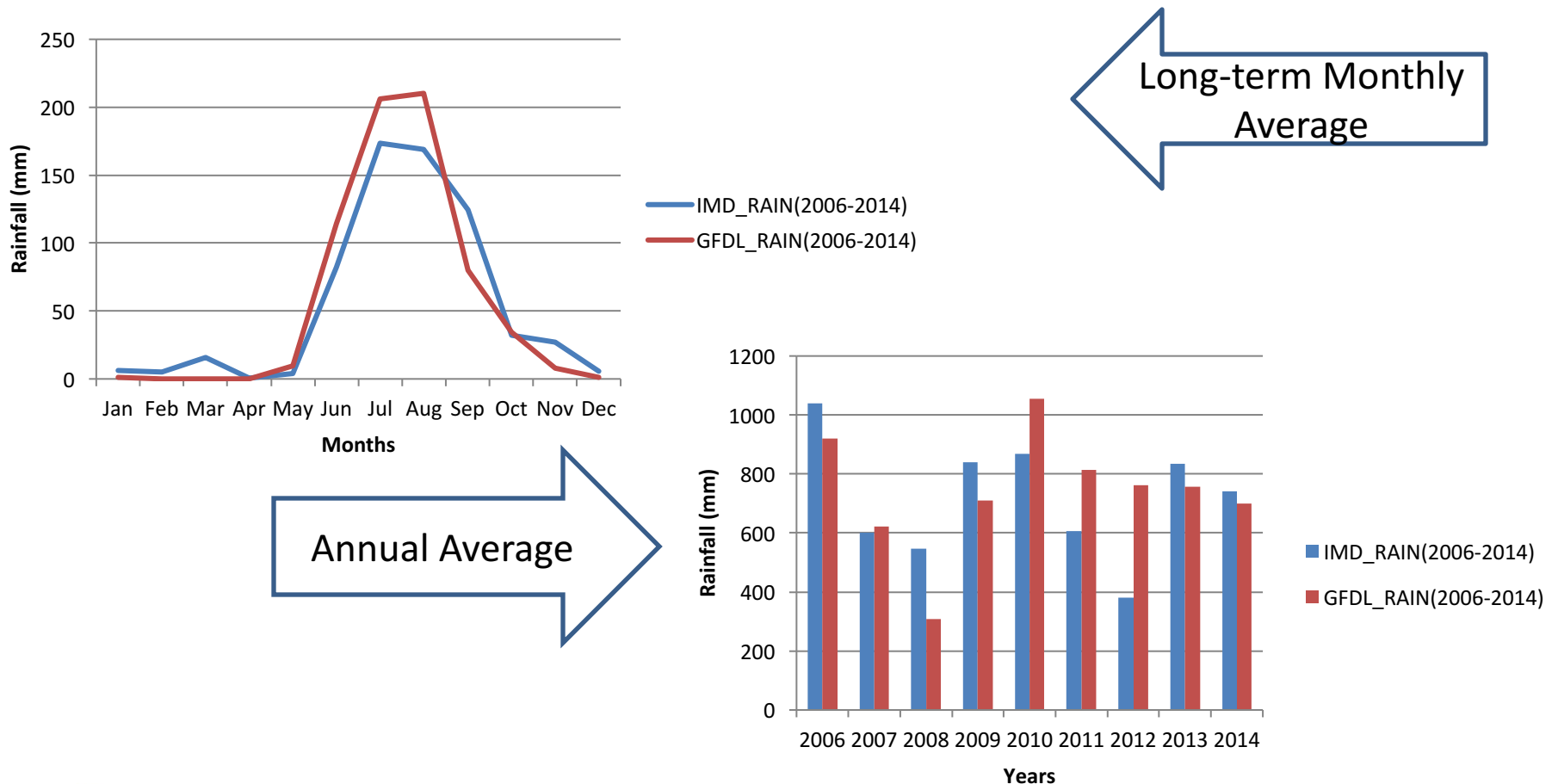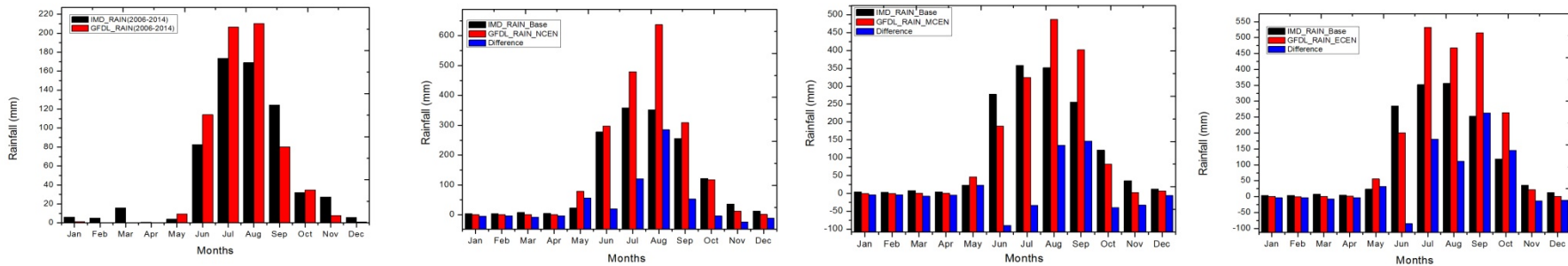
Climate Projections of Bhokardhan

Minimum Temperature (Near, Mid, End Century)

Maximum Temperature (Near, Mid, End Century)

Rainfall (Near, Mid, End Century)

Key Inferences

	Base Period (1985-2014)	Near Century (2016-2040)	Mid Century (2041-2070)	End Century (2071-2100)
Min Temp Change (°C)	19.11	+1.8	+2.91	+3.76
Max Temp Change (°C)	33.28	+1.08	+2.32	+3.22
Rainfall % change	675.24mm	+13.77	+13.60	+26.50

Increase in minimum temperature higher then Maximum Temperature

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- No long term trend observed in temperature and precipitation for near century and end century

- Positive trend observed in minimum and maximum temperature for mid century

- Change in minimum and maximum temperature is significant at 5% level of Significance in all three centuries.

Community perceptions about Climatic risks in the block

Information collected through -- **Community Driven Vulnerability Evaluation – Programme Designer** (CoDrive-PD) tool, developed by WOTR:
- The tool helps in documenting community's knowledge of the local climate trends, coping responses, and history

Important climate risks as perceived by farmers from villages in Bhokardhan block:

- Drought & drought like situation

- Prolonged dry spells

- Increased summer and winter temperatures

- Unseasonal / delayed rainfall

- Hailstorms

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Major impacts

- Decrease in productivity of crops
- Groundwater decline
- Decrease in soil moisture
- Decrease in fodder resources
- Increase in incidence of diseases (among livestock)
- Income levels have gone down

Key question -- Can climate projections help in developing appropriate strategies to minimize risks and maximize opportunities?

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Opportunities

- The resolution of projected (0.25×0.25°) data is comparable to the ground data (IMD) -- which offers opportunity to study potential impact of climate change

- Use of projected climate data sets to assess wet and dry spells – implications for crop and water resources management

- Availability of data at daily scale -- helps in assessing and managing risks due to natural hazards such as Flood and Drought

Limitations

- Only one point represents the whole grid which covers two or three villages – therefore data not sufficient to assess vulnerabilities and develop adaptation plans at village level

- At present use of data is limited to scientific community only.

To Learn

How to get 5*5km resolution data to make projections at village level -- that would help in designing location specific adaptation plans
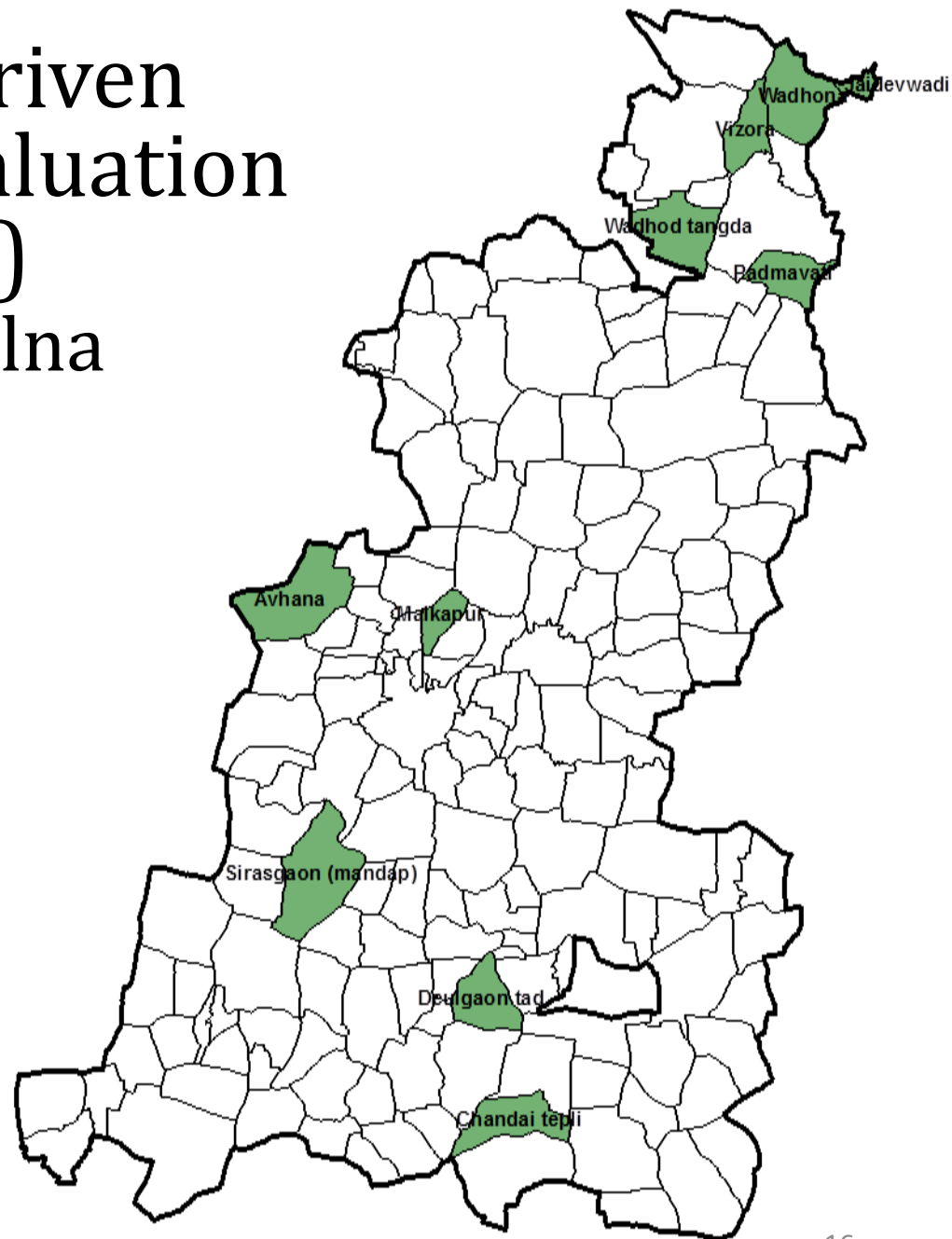
How to downscale models and generate data that can help in developing location specific projections

What criteria to be considered while choosing a model based on regional characteristics and the purpose.

How to avoid biasness in the daily data.

Thank You

Community Driven Vulnerability Evaluation (CoDRIVE)
Bhokardan, Jalna

Responses by people

- Shift from subsistence farming to cash cropping (Onions, soybean, BT cotton, vegetables)
- Extensive irrigation (lateral, deepening, farm ponds)
- Excessive use of fertilisers and pesticide (to obtain better yields)
- Relying on genetically modified seeds
- Crop insurance, crop loans (fodder & irrigation)
- Migration
- Shift from indigenous cotton to BT cotton (Labour shortages, yield is high)
- Sugarcane to cotton (being water intensive)
- Uptake of horticulture crops
- Health issues have increased

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