

# Risk and Vulnerability: Lessons from a Peri-urban Case

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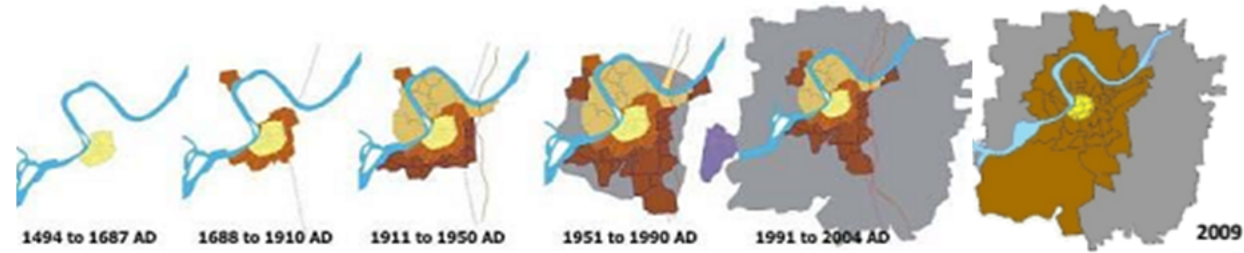
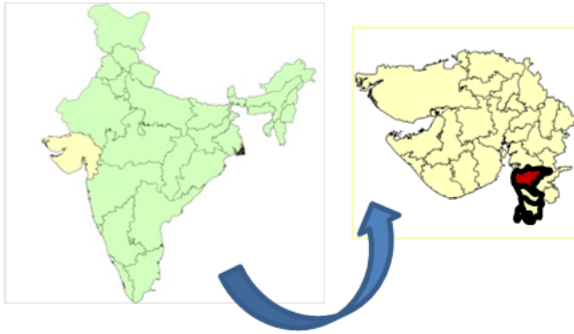


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# Surat



- The average decadal population growth in Surat has been more than 70% since 1971

*fastest growing city in India, 2011 Census population – 4.5 Million*

- Hub of small and medium scale industries in textiles, diamond, chemicals manufacturing
- **Highest % share of migrants** in million plus cities – industrial & agricultural
- **Almost 90% of the area exposed to various natural disasters**
- **LECZ - combination of riverine and tidal floods leading to the flood disaster**



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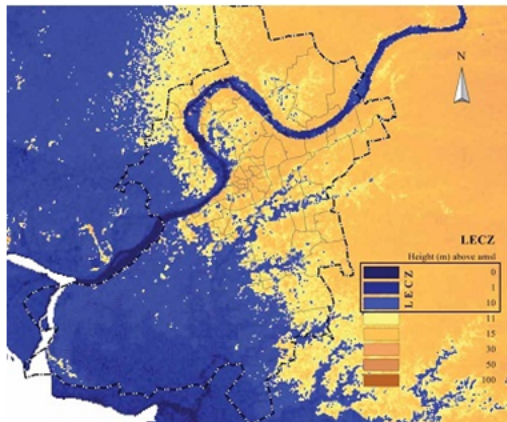
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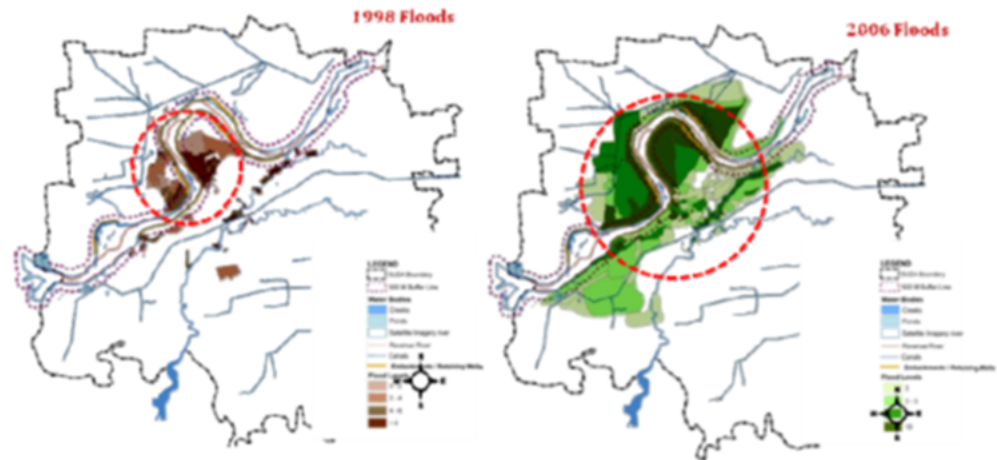
# Context of Surat Floods in the Year 2006

- The last two floods were due to **emergency discharges from Ukai dam**
- More than **80% of the city was under water, industry and commerce driven city was brought to a standstill for more than a month**



LECZ in Surat

Source: Karanth and Archer, 2015: 518



Increase in inundated area in Surat from 1998 to 2006

Source: CEPT in association with Alchemy Urban Systems Bangalore, Draft Report, 2009

- Surat's detailed flood mapping has often recorded the areas falling under the jurisdiction of SMC, **flood impacts and other knowledge in peri-urban not known!**



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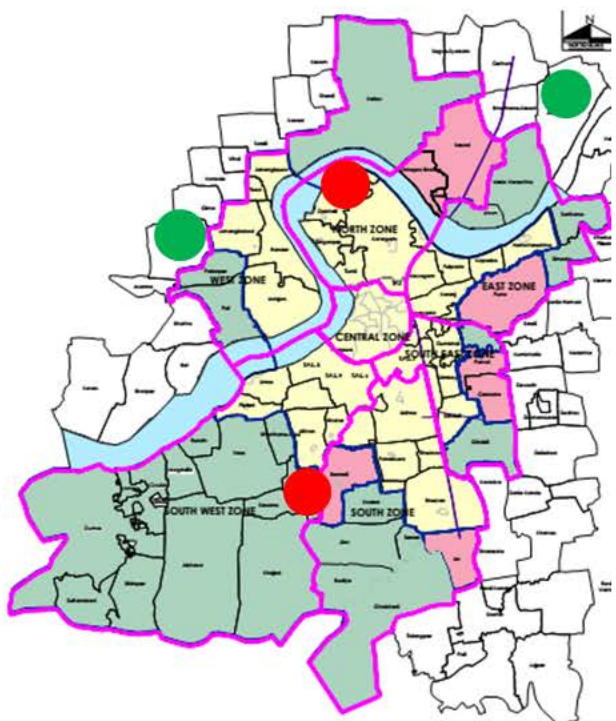
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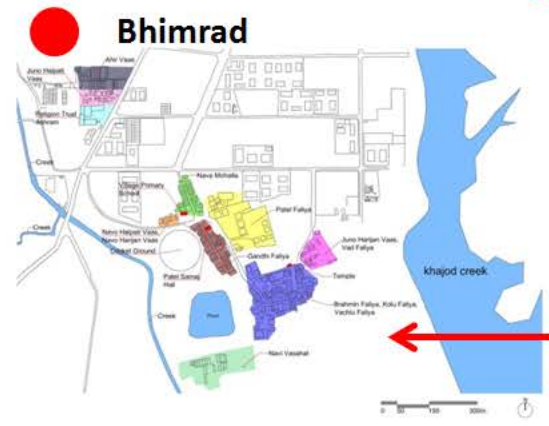
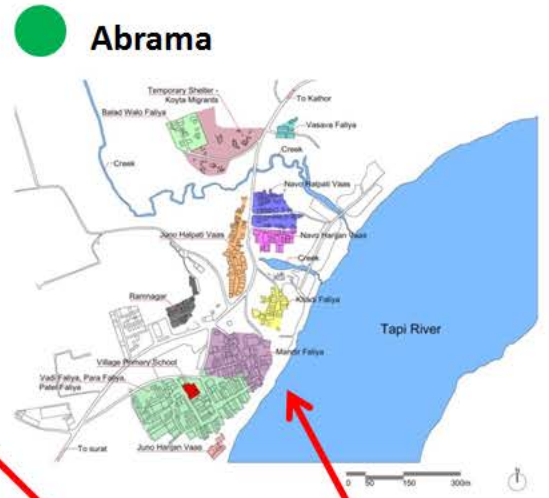
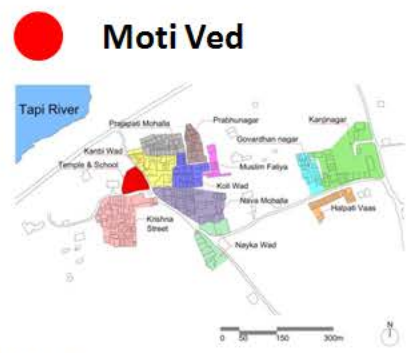




# Study Areas – 4 villages, 216 sample Households



- Urban Jurisdiction
- Rural Jurisdiction



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# Analytical Framework: Risk-Vulnerability Equation (IPCC, 2014)

**Risk = Exposure \* Vulnerability** ... Vulnerability-Exposure matrix

## Social Vulnerability indicators

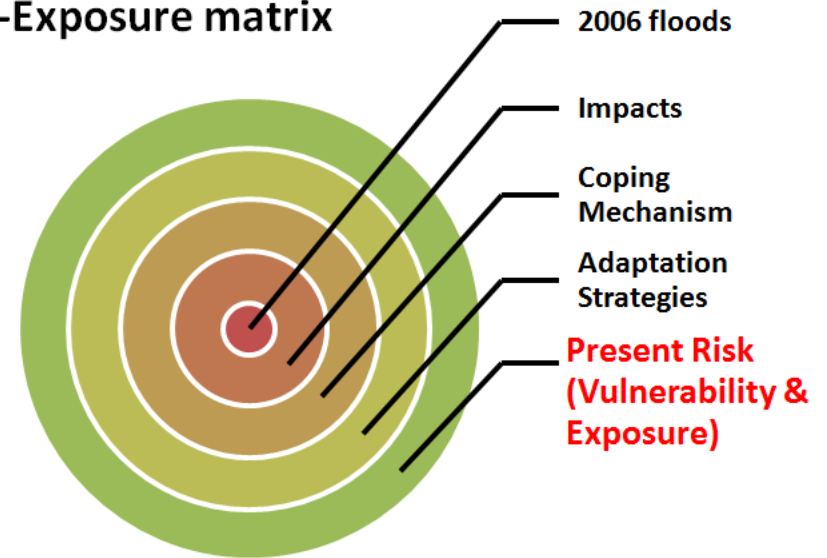
- Small and Large HH types
- SC, ST and OBC communities
- Children and the elderly members
- Migrant status
- Livelihood types - farm and non-farm labour, small and marginal farmers, animal husbandry, petty traders and service providers, small remittances
- Women headed households,
- Education of household head,
- Poor households,
- No healthcare assistance

## Physical Exposure

- Mean inundation levels
- Mean days of exposure

## Physical Locations

- Hamlets next to river and creeks
- Hamlets with slum like conditions
- Urban and Rural households



## Results of the Vulnerability-Exposure Matrix

- Hamlets next to the rivers or creeks, those like slums and the urban villages have been more vulnerable
- SC and ST, women headed households, those with elderly members and those with farm and non-farm labour as primary source of household income are socially most vulnerable concentrated in above mentioned areas



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# Conclusions

- ACCCRN's Surat City Resilience Initiative – **Focus on the Structural Measures**
  - **End to end early warning system** – valued in 2013 floods
  - **Flood Embankments and the Sluice Gate Regulators**, UHCRC, UrSMS
- **Neighbours and network of relatives** – most important source of assistance for the affected households. **CSOs were largely absent**. Only the **government institutions** had the **capability, accountability and mandate** to respond to crisis
- Institutional process of **urbanization** needs to be more **inclusive, predictable and beneficial** even for those households who **do not have tangible assets – farm labourers**
- **Periodic vulnerability assessments – preparing vulnerability Atlas**
- Support towards **housing, infrastructure** etc. lacking especially in the villages of urban jurisdiction, **competition with large masses – creation of slums!!**
- Rural context supports people through **social and production relation reciprocity** in crisis; **entitlements** related to food, education and housing appeared to be slightly **better targeted bracing adaptive capacities**



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# Thank You!



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