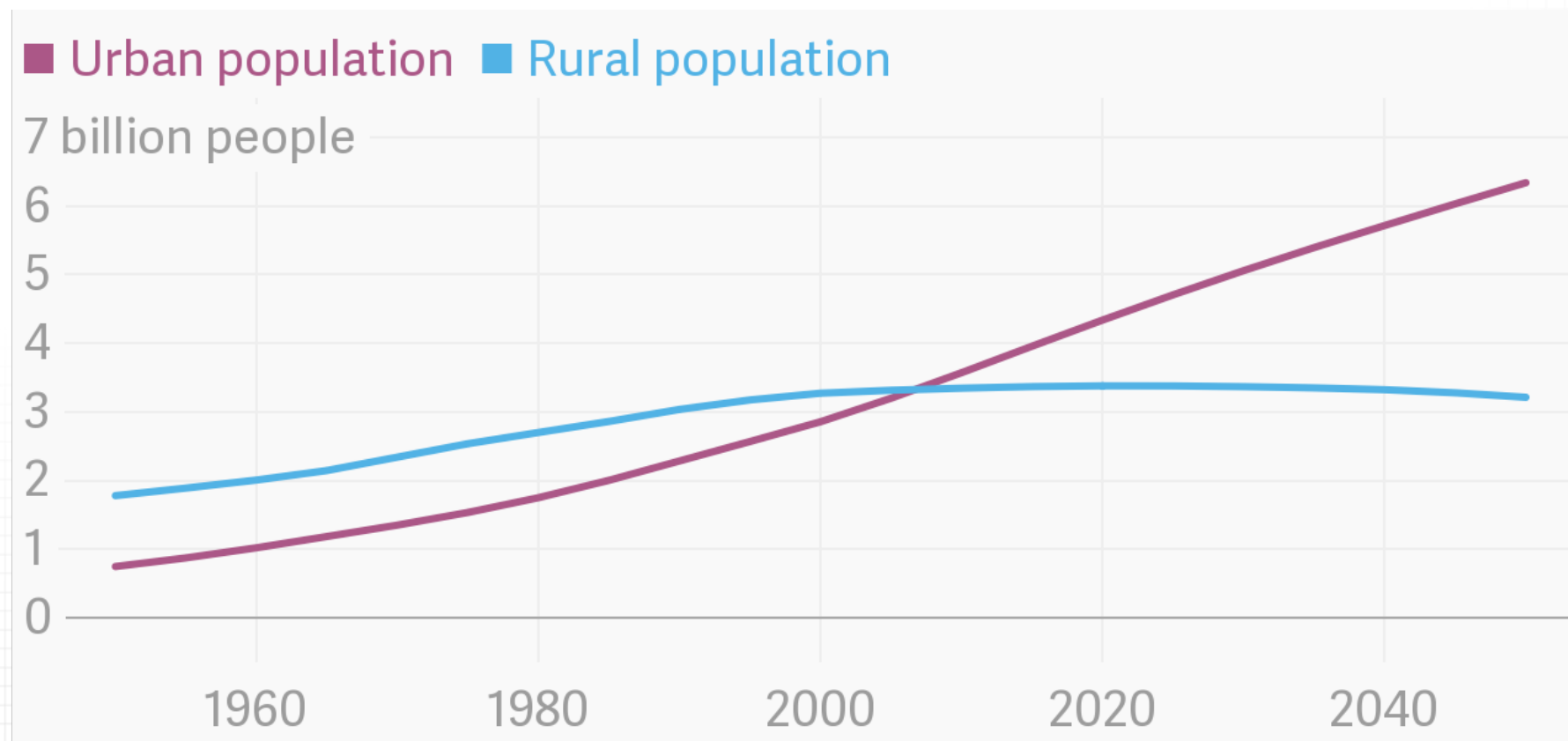# OPERATIONALIZING RESILIENCE FOR SRINAGAR SMART CITY

Omar Bashir

2020 Project Management Symposium

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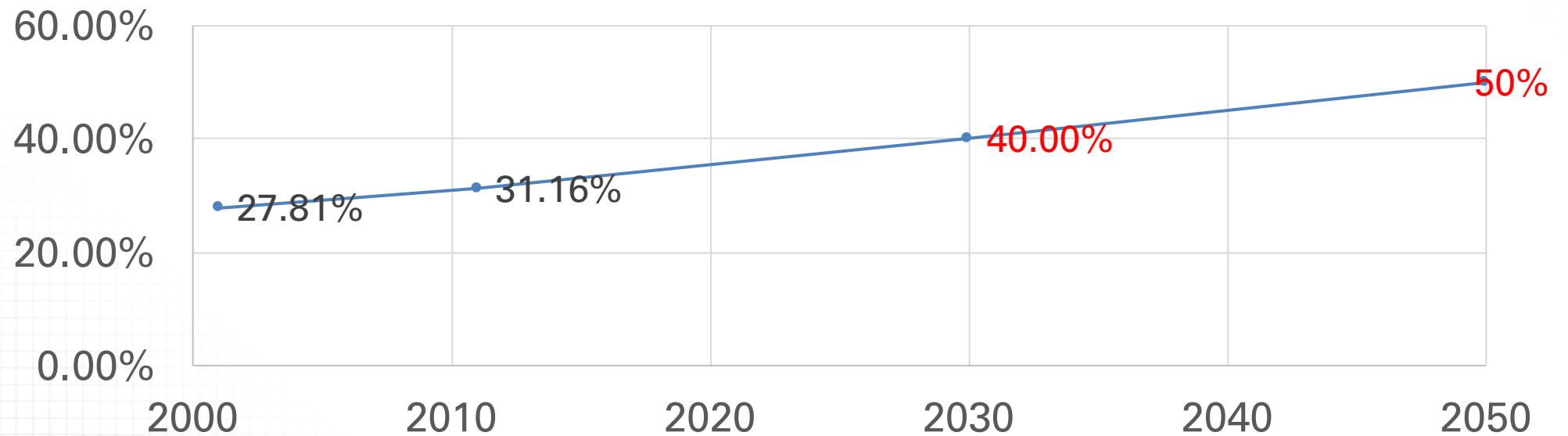
Urbanization – a global phenomenon

■ Urban population   ■ Rural population

Urban vs rural population growth (UN Population Division, 2017)

Urbanization in India

Urban Population growth in India

(Chandramouli, 2011)

Issues with rapid Urbanization

- Problems with rapid urbanization include
  - burden on the existing infrastructure,
  - lack of housing,
  - development of slums,
  - inefficient transportation,
  - pollution etc.

Issues with rapid Urbanization

- Urban areas usually face four types of stressors
  - Natural
  - Technological
  - Economic
  - Man-made

  (Desouza & Flanery, 2013)

Issues with rapid Urbanization

- The lack of adequate and poorly managed infrastructure and services have often been one of the reasons for India's inability to attract foreign direct investments

Smart City Mission in India

- With a dual aim to improve the quality of life of the inhabitants and to drive economic growth, (Gupta & Hall, 2017), the Government of India launched the Smart City Mission in 2015.

- Smart City Mission used a competition-based method as a means for selecting cities for funding. Five rounds of selections were conducted.

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- The Smart Cities Mission in India follows a three-pronged strategy which includes:

Provision of basic core infrastructure and amenities- roads, highways, water supply, affordable housing etc.

Smart Solutions- Use of ICT to improve infrastructure and services.

Area Based development- retrofitting, redevelopment, greenfield projects and pan-city initiative to improve the liveability of the city.

Gupta & Hall, 2017

Srinagar Smart City

KennyOMG (2015)

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- Srinagar is the summer capital of the Indian state (now Union Territory) of Jammu and Kashmir.

- Srinagar Smart City project was approved in Round 3 of the Smart City challenge held in April 2017.

- Srinagar Smart City "aspires to leverage its Natural & Cultural heritage/ tourism, through innovative and inclusive solutions, enhance the quality of life for its citizens".

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Disasters in India

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Disaster Profile of India

Nearly 59% of the geographical area of India is vulnerable to earthquakes,

Around 68% of cultivable land or 18% of the total area is drought prone.

Nearly 12% of the land is prone to flood and

The coastline is prone to cyclones and tsunamis.

(NDMA, 2019)

Disaster Profile of India

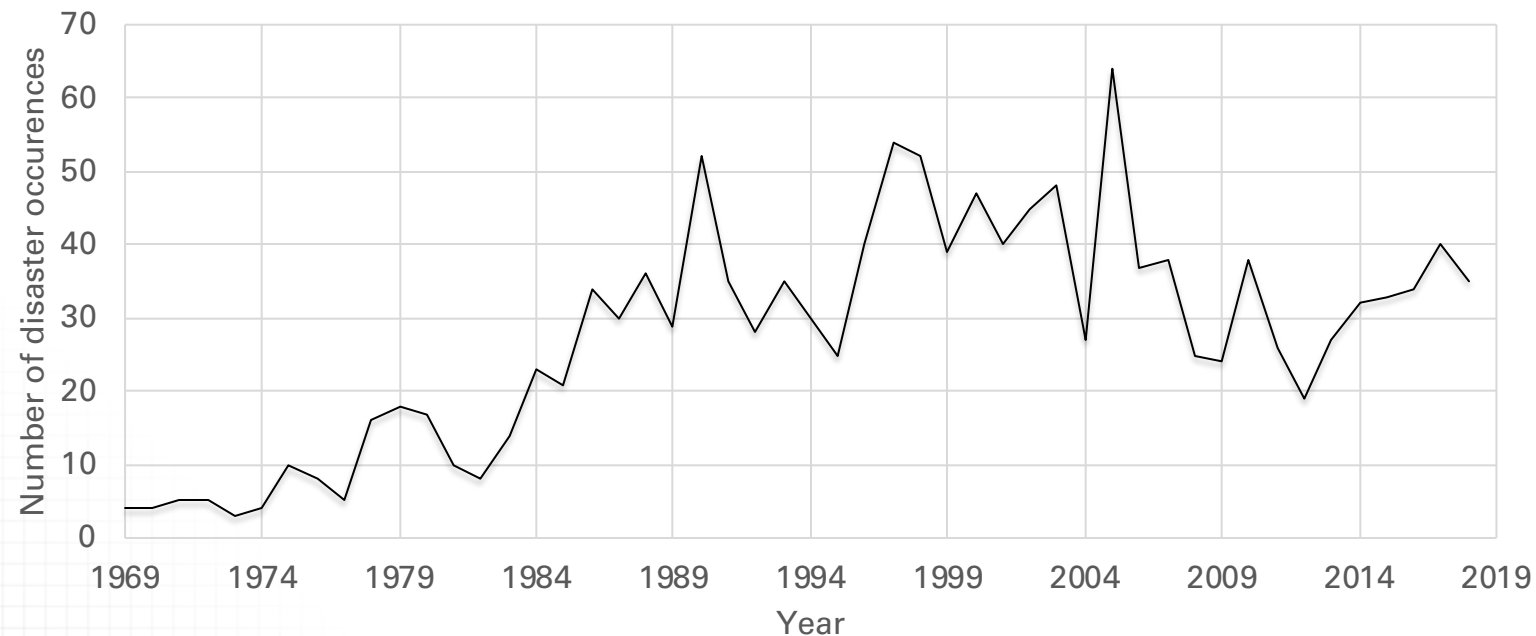Hilly regions are also vulnerable to snowstorms, landslides and avalanches.

Twenty-two of the thirty-six states in India is multi disaster-prone.

India is also vulnerable to manmade disasters, also Chemical, Biological, Radiological and Nuclear Emergencies.

(NDMA, 2019)

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Reported disasters in India

Reported disasters in India from 1969 to 2019

Reported disasters in India from 1969 to 2019 (EM-DAT: The Emergency Events Database - Université catholique de Louvain (UCL) - CRED, D. Guha-Sapir - www.emdat.be, Brussels, Belgium)

Recent natural disasters in Jammu and Kashmir State

2005 Kashmir Earthquake

2005 Waltengu Snow blizzard

2010 Ladakh flood

2014 Kashmir flood

2017 Gurez avalanche

Resilience

- From an urban planning sense,
    - if a city can absorb,
    - adapt and
    - responds to changes without any loss of function, the city can be termed as a resilient city

    (Tompkins & Hurlston-McKenzie, 2011)

Resilience

- Buildings, spaces and places which are critical for a city's built environment need to function even during any disaster event. Therefore, there is a need to "design, develop and manage resilience" for these elements of the city's built environment (Haigh & Amaratunga, 2011).

Methodology

Development for 5 stage resilience maturity model

Method			
	Literature Review and pilot interview	Delphi Technique	Interviews

Results			
	Mapping of selected framework	Definition of maturity levels for RMM	Adoption of SMR resilience model

Mapping of Srinagar Smart City Proposal with the Disaster Resilience Frameworks'

Sendai Framework

Understanding disaster risk.	Yes
Strengthening disaster risk governance	No
Investing in disaster risk reduction for resilience	No
Enhancing preparedness for effective response	Yes
Effective recovery, rehabilitation and reconstruction	Yes

100 Resilient Cities Framework

Provide reliable communication and mobility.	No
Provide and enhance natural and manmade assets.	No
Foster long term and integrated planning.	Yes
Promote leadership and effective management.	No
Meet basic needs.	Yes
Ensure public health services.	No

100 Resilient Cities Framework

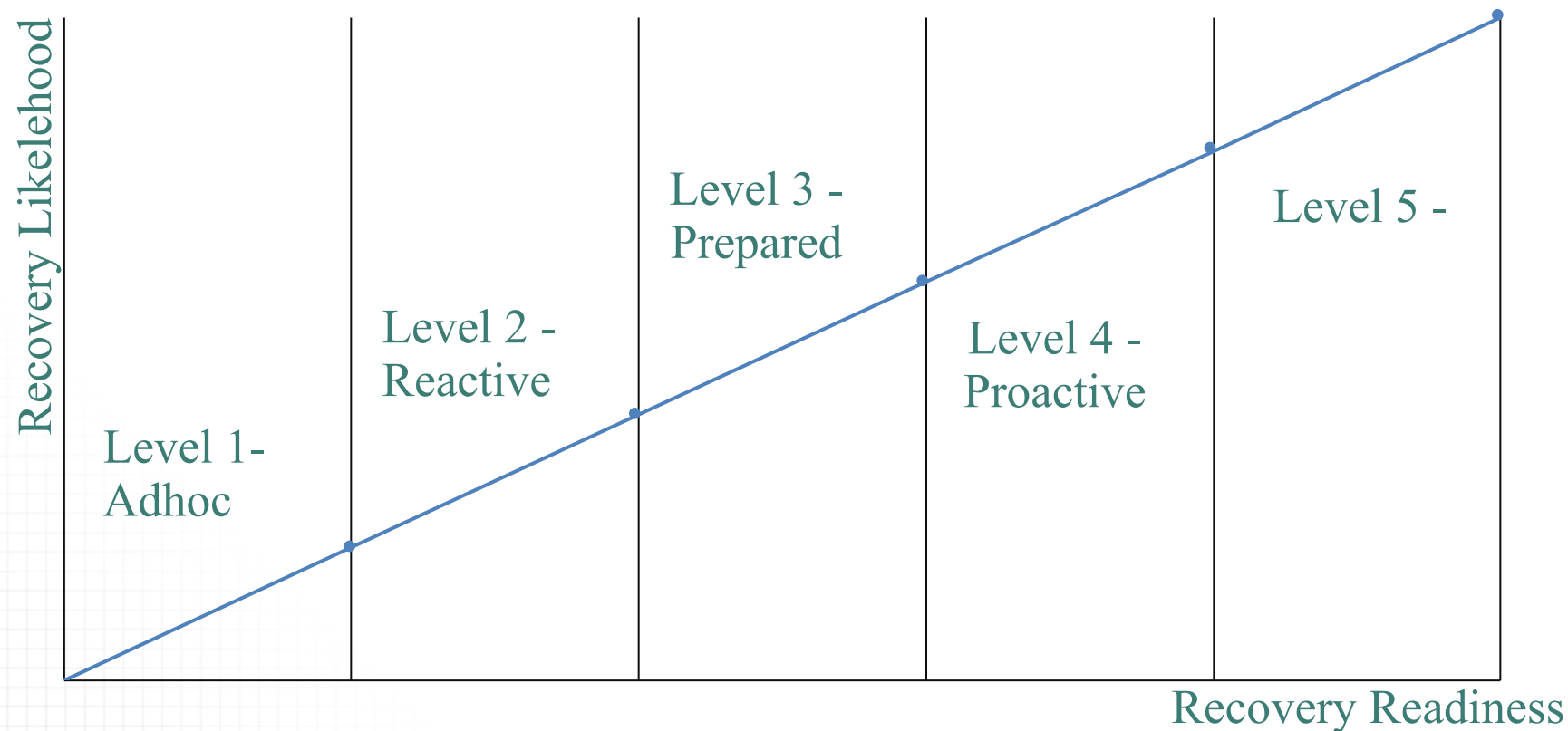|	
Ensure social stability, security and justice.	No
Support livelihoods and employment.	No
Promote cohesive and engaged communities.	No
Foster economic prosperity.	No
Ensure continuity of critical services.	Yes
Empower a broad range of stakeholders.	No

Resilience Maturity Model

- The Maturity model was modified to incorporate the elements required for depicting the maturity stages in developing resilience in a smart city.

- A RMM is helpful in incorporating resilience systematically and incrementally (Hernantes, et al., 2019)

Resilience Maturity Model

- The Resilience Maturity Model was developed using two scales to measure the level of maturity of each stage. The two scales include- (a). Recovery Likelihood and (b). Recovery readiness.

- The incremental stages of the Resilience Maturity Model are mapped against the increment Recovery Likelihood and Recovery Readiness.

5 Stage Resilience Maturity Model

Adoption of SMR framework

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		Adhoc	Reactive	Prepared	Proactive	Resilient
Governance	Development and enhancement of laws and regulations (G1)	GA1	GR1	GPR1	GP1	GRE1
Institution	Municipality, Smart City Authority etc (I1)	IA1	IR1	IPR1	IP1	IRE1
Planning Systems	Education and Training (P1)	PA1	PR1	PPR1	PP1	PRE1
	Resilience action plan development (P2)	PA2	PR2	PPR2	PP2	PRE2
Technical capacity	Reliability of infrastructures (T1)	TA1	TR1	TPR1	TP1	TRE1
	Development of partnerships with city stakeholders (T2)	TA2	TR1	TPR1	TP1	TRE1
Funding structures	Resources to build up resilience (F1)	FA1	FR1	FPR1	FP1	FRE1

Conclusion

- The Smart Cities were introduced in India to improve the quality of life and increase economic activity.

- Srinagar city is multi-disasters prone.

- Smart Cities of India needs to be resilient to face the impending disaster that India faces.

- Resilience Maturity Model (RMM) present a roadmap for the Smart City stakeholders to incorporate resilience in their smart cities and reduce disaster risks.

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