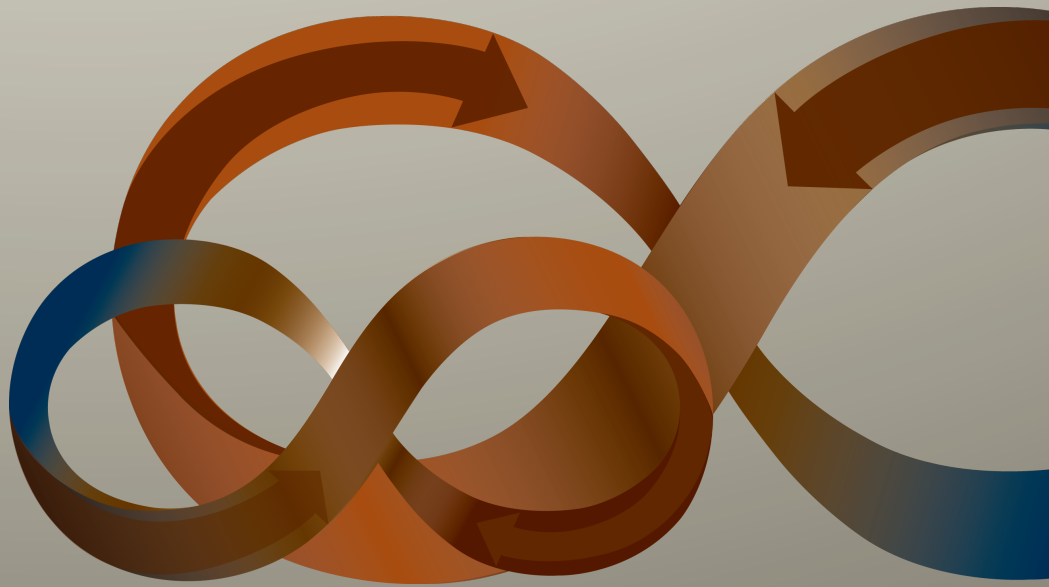
Marcus Moench
President ISET

Experiences Applying the Climate Resilience Framework

Unvarnished realities in resilience practice, thresholds and economic evaluation in urban and rural areas of South and South East Asia



About ISET

What We Do

- Partner with local governments and organizations
- Cutting edge research on systems, risk and vulnerability
- Technical support, training & capacity building

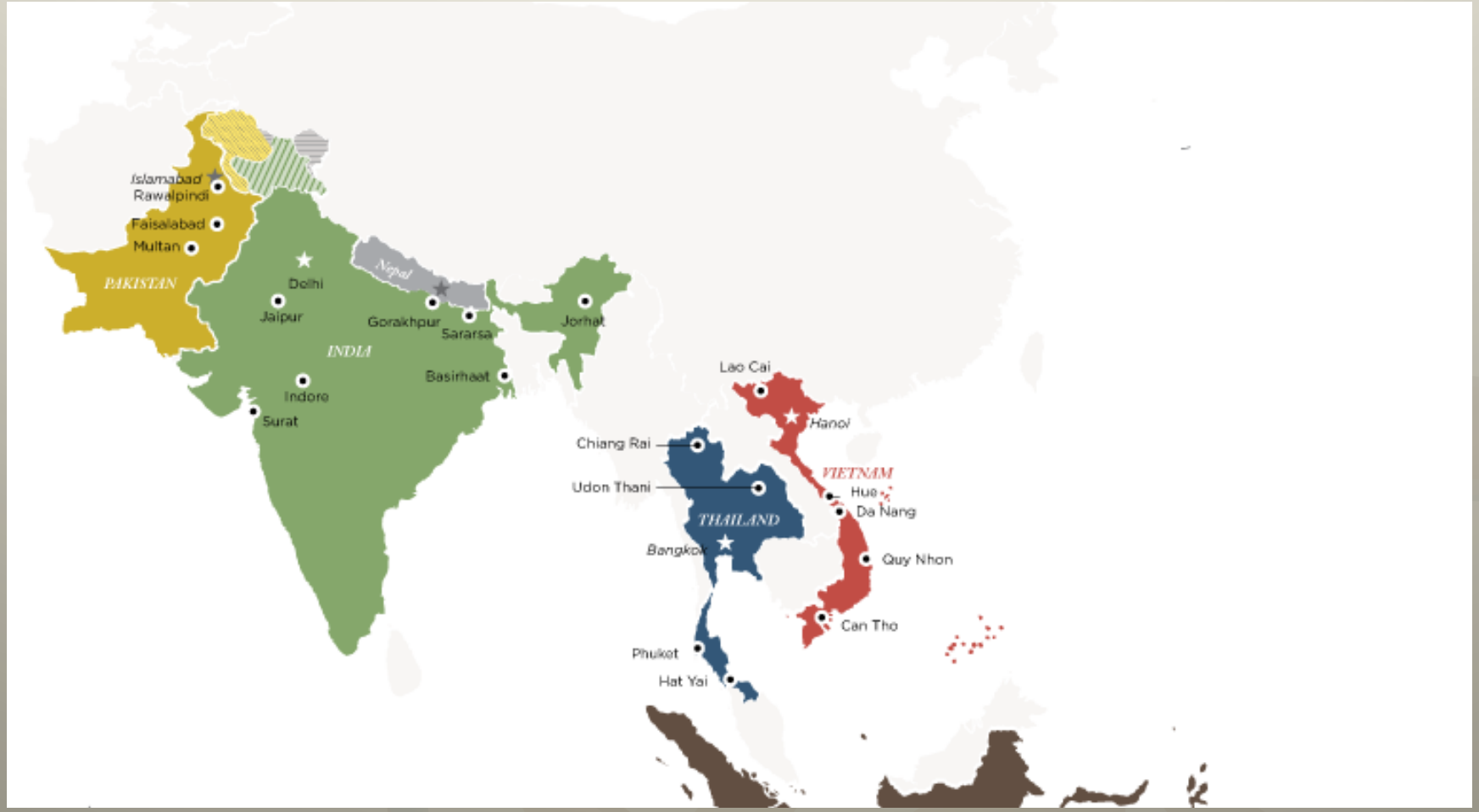
Where We Work

- Western U.S.
- Vietnam
- Indonesia
- Thailand
- Nepal
- India
- Pakistan

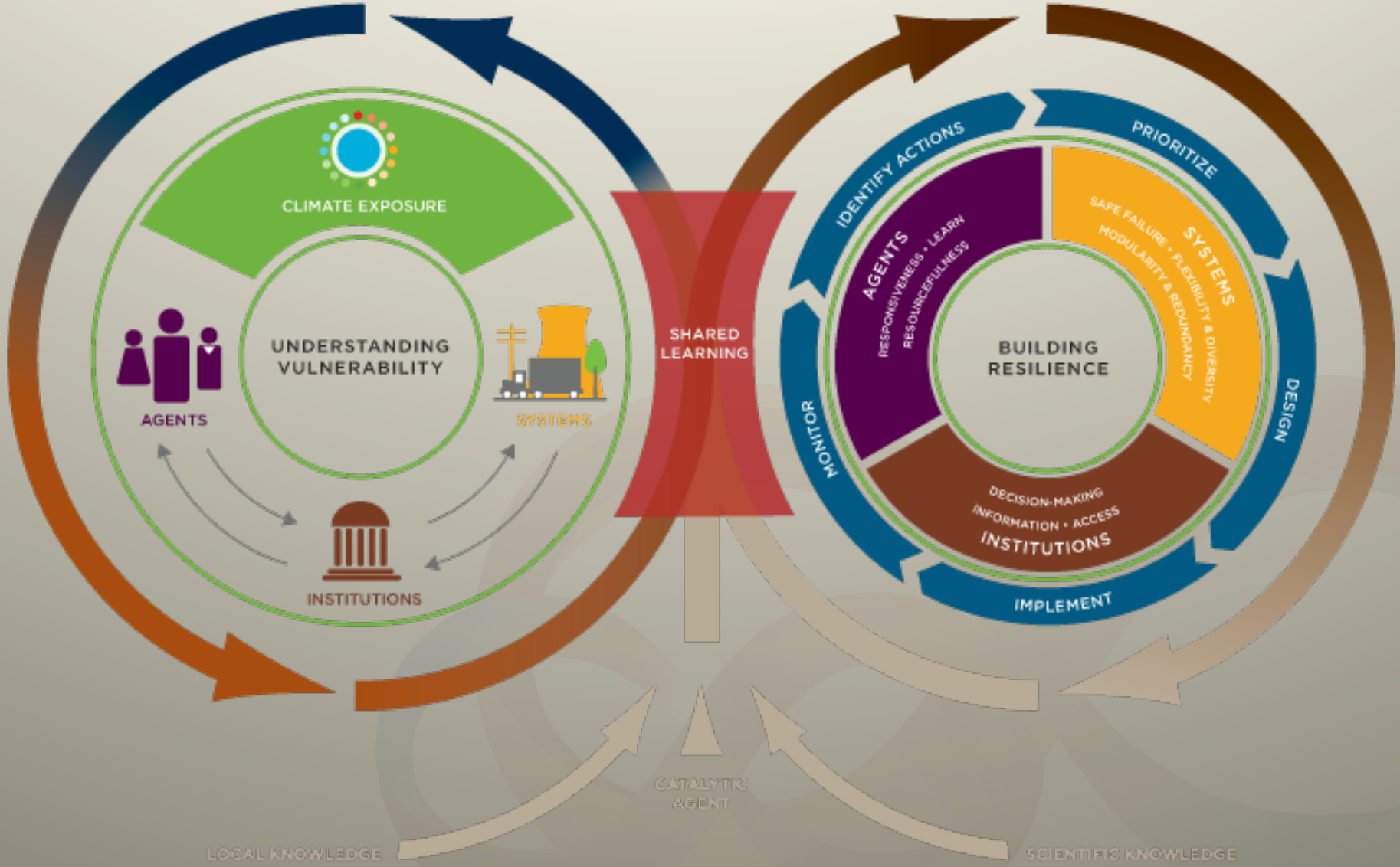
Partnership to address common problems in a changing world

Urbanization, Disaster Risk, Food Systems, Climate Adaptation & Resilience

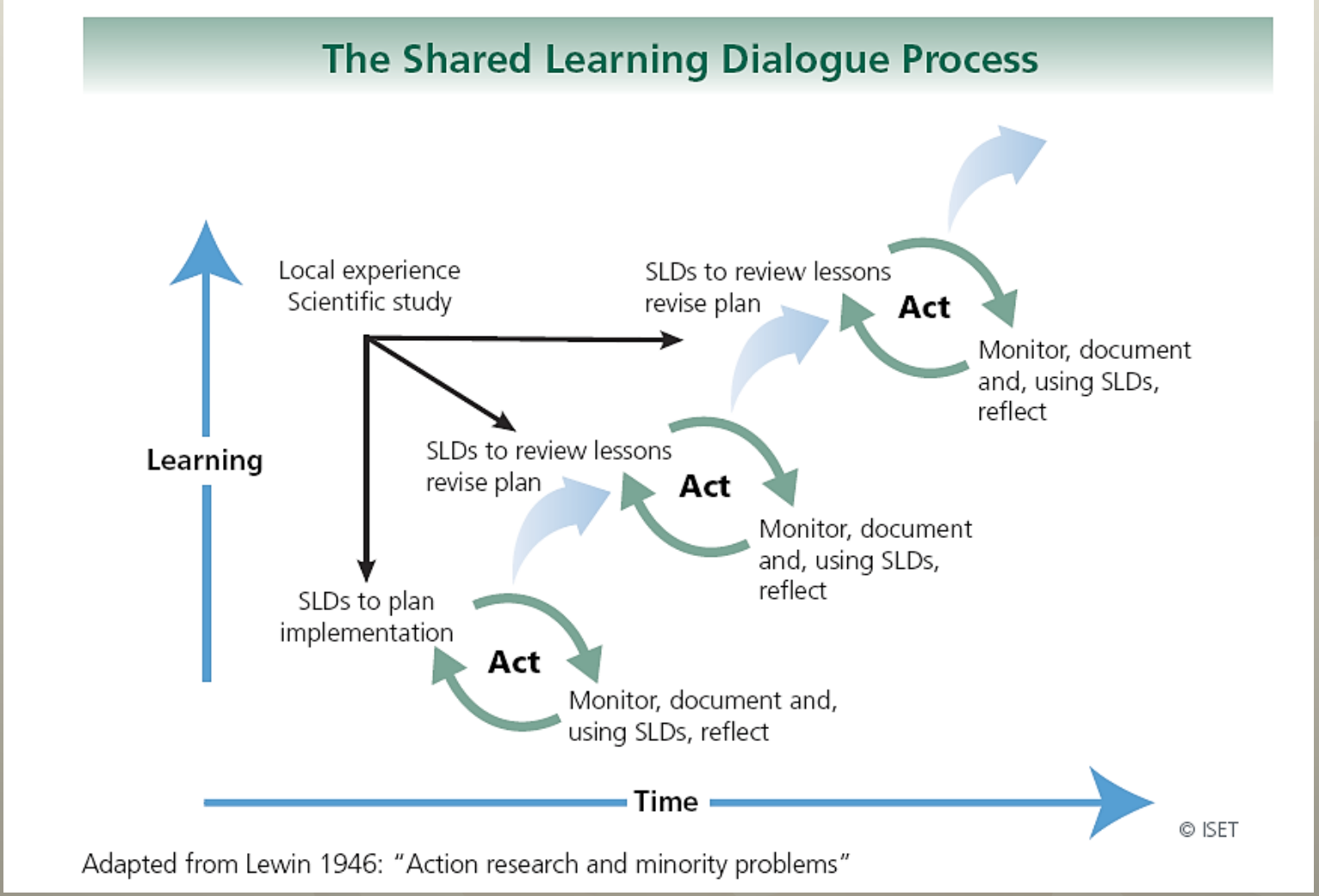
Locations


Islamabad
Rawalpindi
Faisalabad
Multan
PAKISTAN
Delhi
Jaipur
Nepal
Gorakhpur
Sararsa
Jorhat
INDIA
Basirhaat
Indore
Surat
Lao Cai
Hanoi
Chiang Rai
VIETNAM
Udon Thani
Hue
Da Nang
THAILAND
Bangkok
Quy Nhon
Can Tho
Phuket
Hat Yai

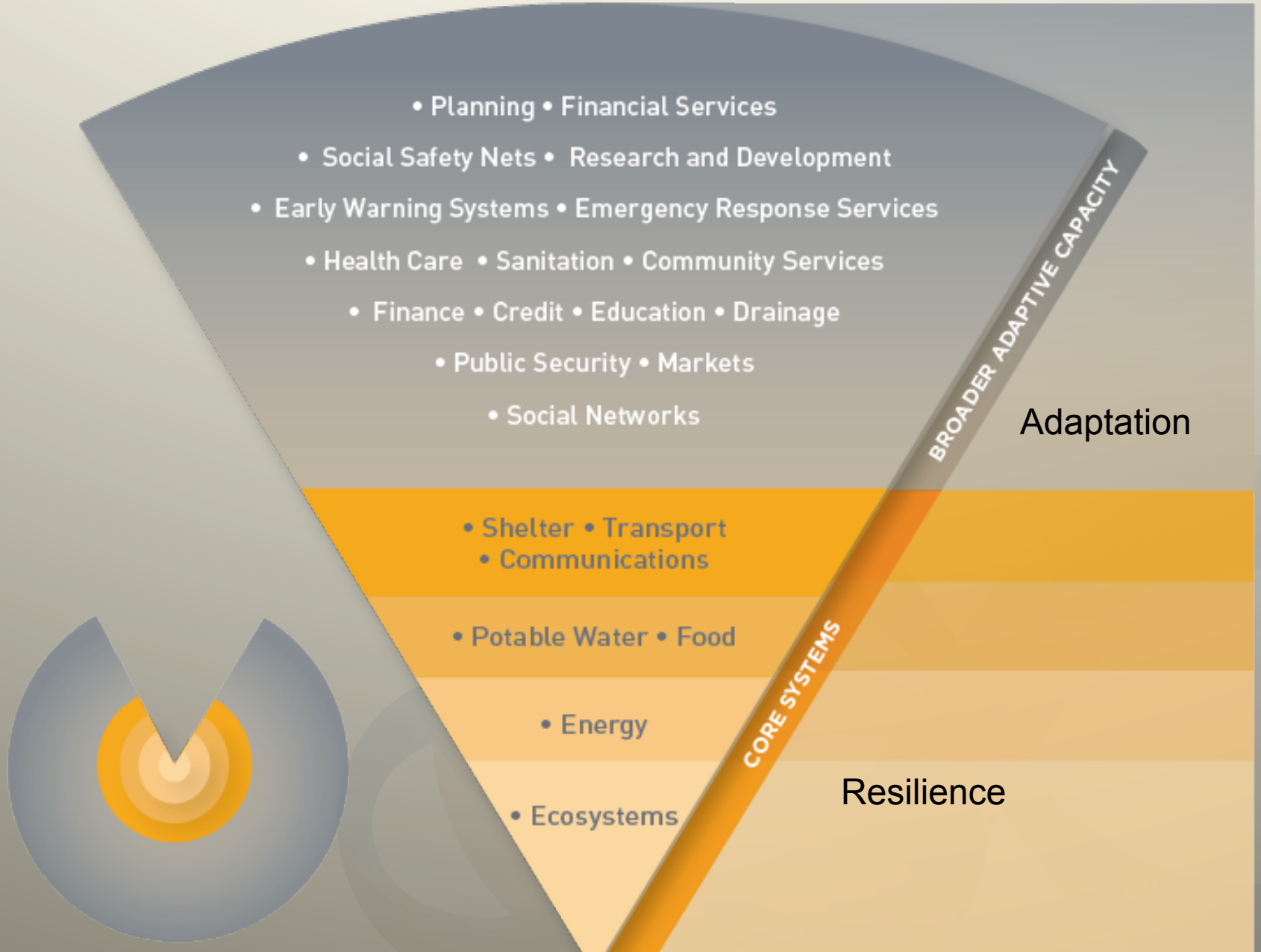
The Resilience Framework



Actualizing through Shared Learning



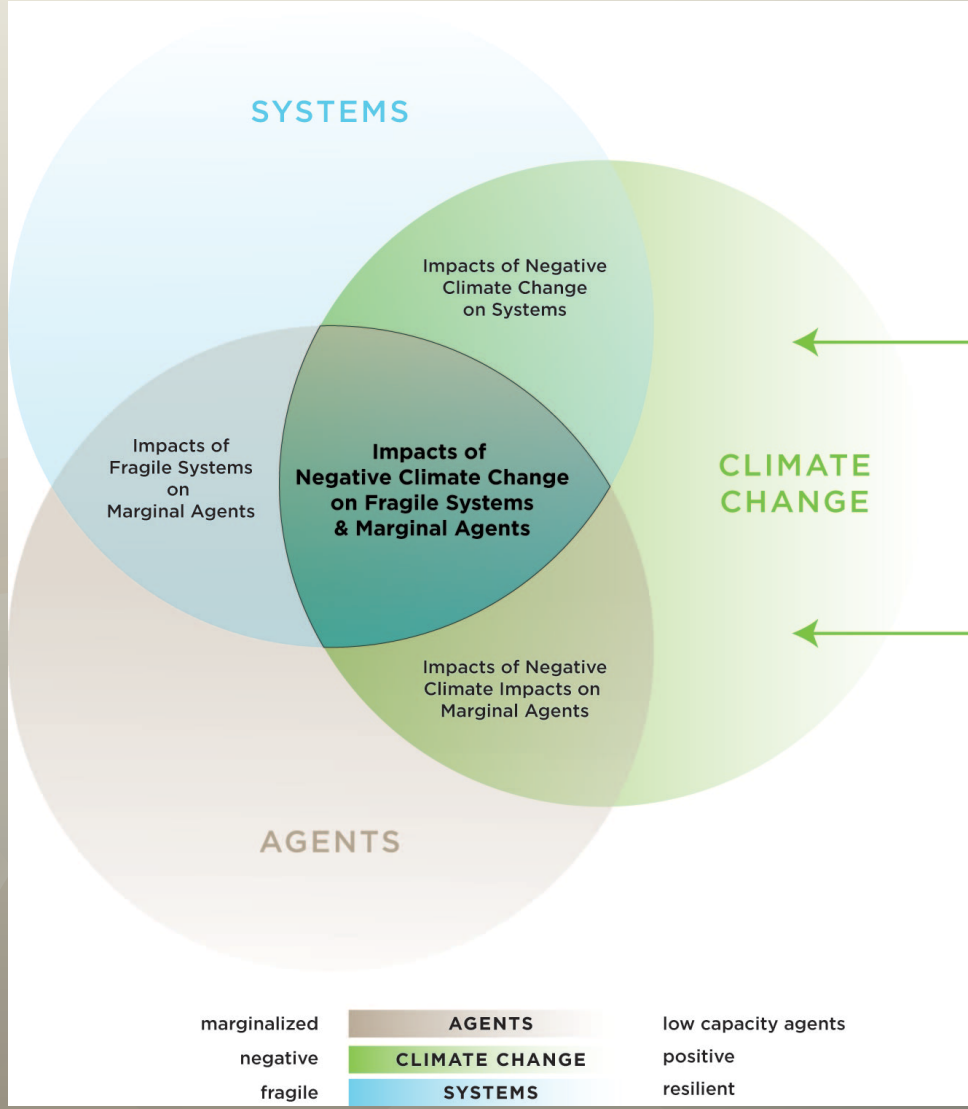
How do Resilient Systems Relate to Adaptation?



How do Systems relate to Vulnerability?

Vulnerability = f

Fragile Systems
+
Low Capacity Marginalized Populations
+
Constraining Institutions
+
Exposure



Resilience, Thresholds & Climate Adaptation

Resilient systems reduce both disaster risk and long-term stress

They provide the safety and security that is essential for
People to change strategies – i.e. to adapt

All systems, however, will fail if conditions exceed critical thresholds –
We need to know the thresholds and adapt before they are exceeded

Climate Adaptation and Disaster Risk Management are
Inherently interlinked

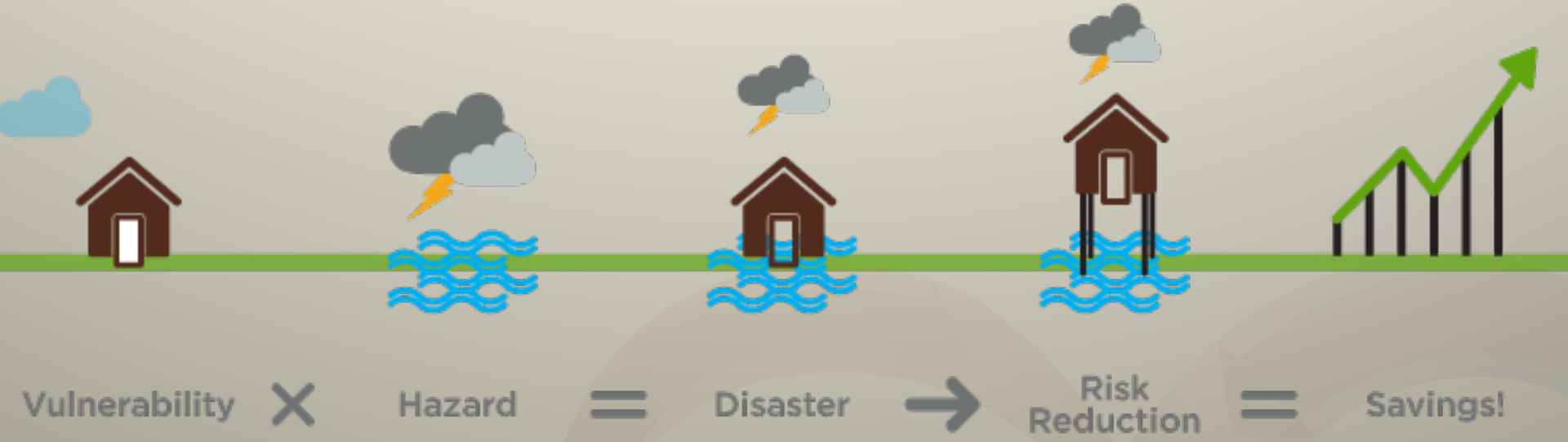
Resilience Planning

- ACCCRN: 15 Cities in Asia, most of our work Vietnam & India
- Post-disaster recovery – points of entry for building resilience in Pakistan
- DRR-Adaptation linkages with in India
- LAPA approach in Nepal with follow-up support
- American red cross – resilience in urban areas methods
- Food systems analysis (Nepal, Latin America)
- Boulder Colorado: Flood and Fire resilience

Common Issues in all Locations

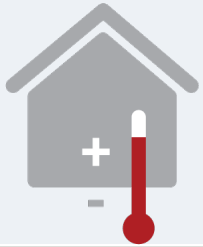
- Surprise and uncertainty
- Fragile systems
- Substantial autonomous activity
- Difficult institutions
  - Politics
  - Land tenure
  - Competing interests
- Differential impacts – not always on the poor
- Similar solution spaces
  - Inundation
  - Storms (to a point)
- Similar problem spaces
  - Moving water, intense storms
  - Interlinked systems
  - Temperature

Example Shelter Resilience



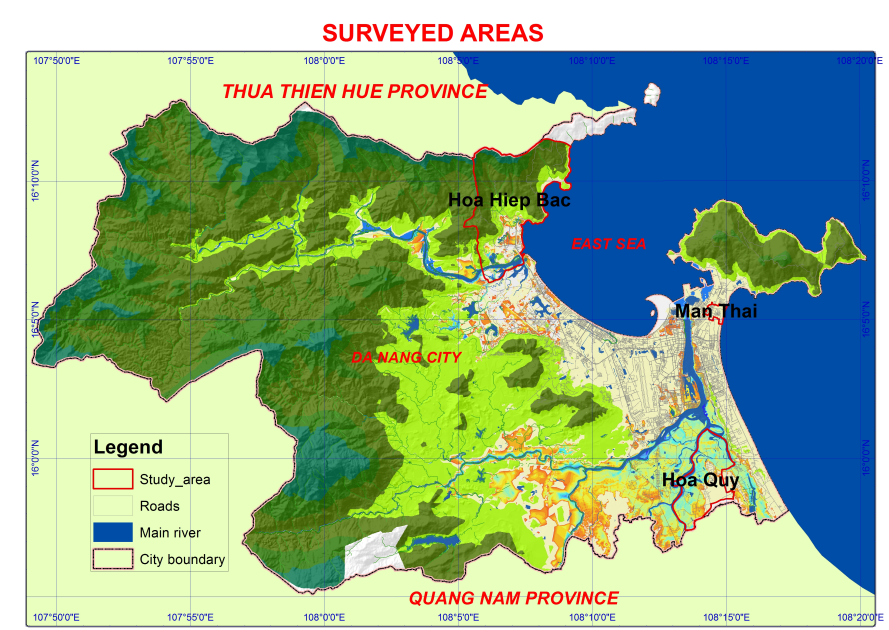
Hazard

Hazard

Typhoon 	• Great uncertainty in all the models predicting typhoon frequency and intensity • Expected intensity to increase
Flood 	• Extreme rainfall events increasing, especially the smaller rainfall events
Temperature 	• Extensions of the hot season • Tmin temperatures at night not reducing

Target Population

Vulnerability ×

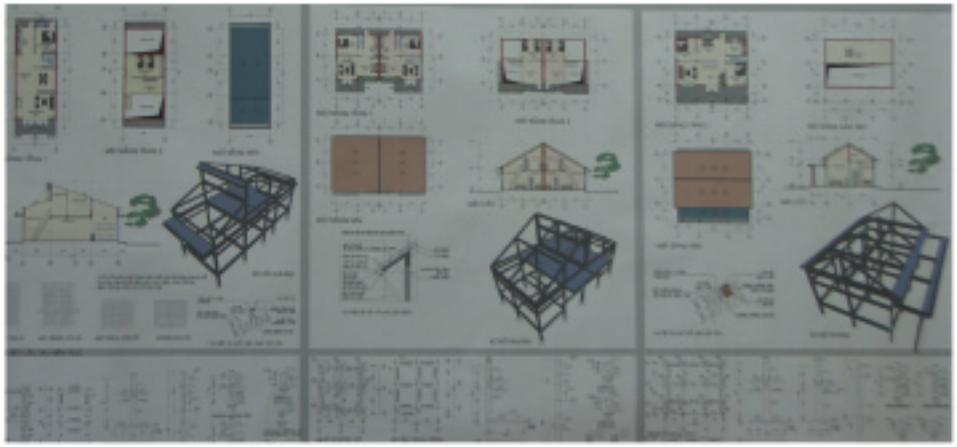


- Low-Income Vulnerable Households
- Located in Peri-Urban Areas where the city is expanding
- Vietnam, India and Pakistan

The typical situation

Autonomous Adaptation

Raised plinth

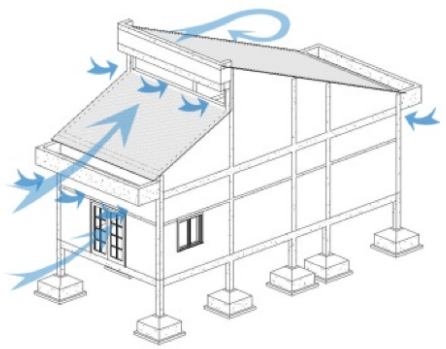
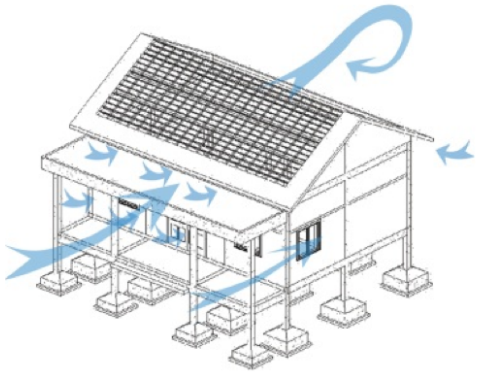
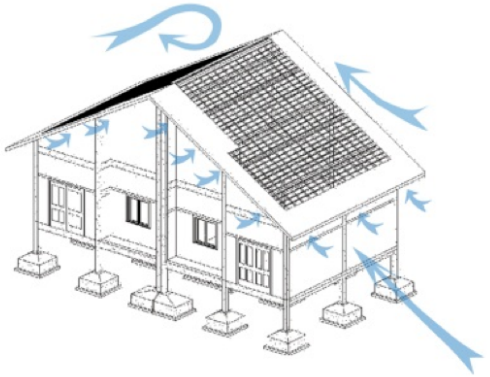


RESILIENT HOUSING
DESIGN COMPETITION
2013

Da Nang, Vietnam
Photographer: Fawad Khan, 2013

Risk Reduction =

Risk Reduction

Tube House	Three-Compartment House	Twin Double-Storey House
		

Source: Thang et al., 2013

RESILIENT HOUSING
DESIGN COMPETITION
2013

6/8

Da Nang, Vietnam
Photographer: Fawad Khan, 2013

Economic Returns Vietnam

- Storm resilient housing Vietnam: Current storm frequency B/C = 1.93, IRR of 11%.
- Increases to B/C of 2.36 with IRR of 16% if typhoon frequency doubles

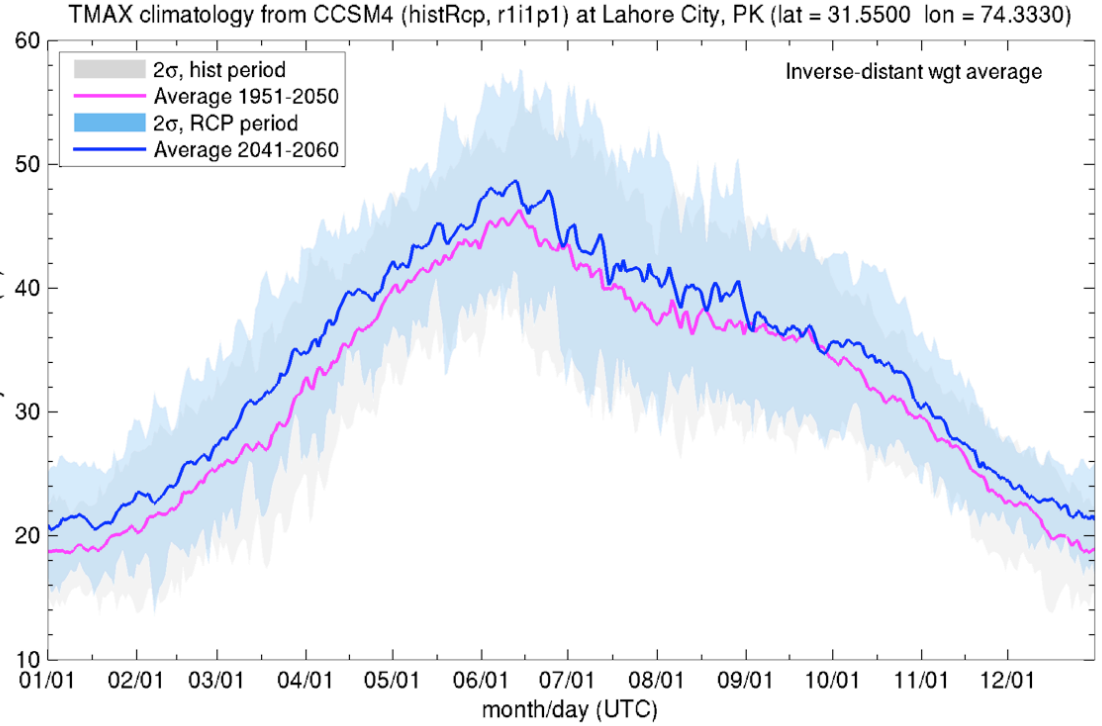
Returns depend on thresholds: If typhoons exceed category 12 on the Beaufort scale, thresholds may be exceeded. Category 4-5 storms on the Saffir–Simpson scale extensive disruption.

The Temperature Conundrum

- Significant temperature increases reliably projected;
- Most attention to increases in maximum temperatures
- Physiologically, however, temperature minima central to the ability of the body to recover
- Passive mechanisms available to reduce impacts of daily temperature maxima – but not for ambient minima
- Particular impacts on women, children, elderly

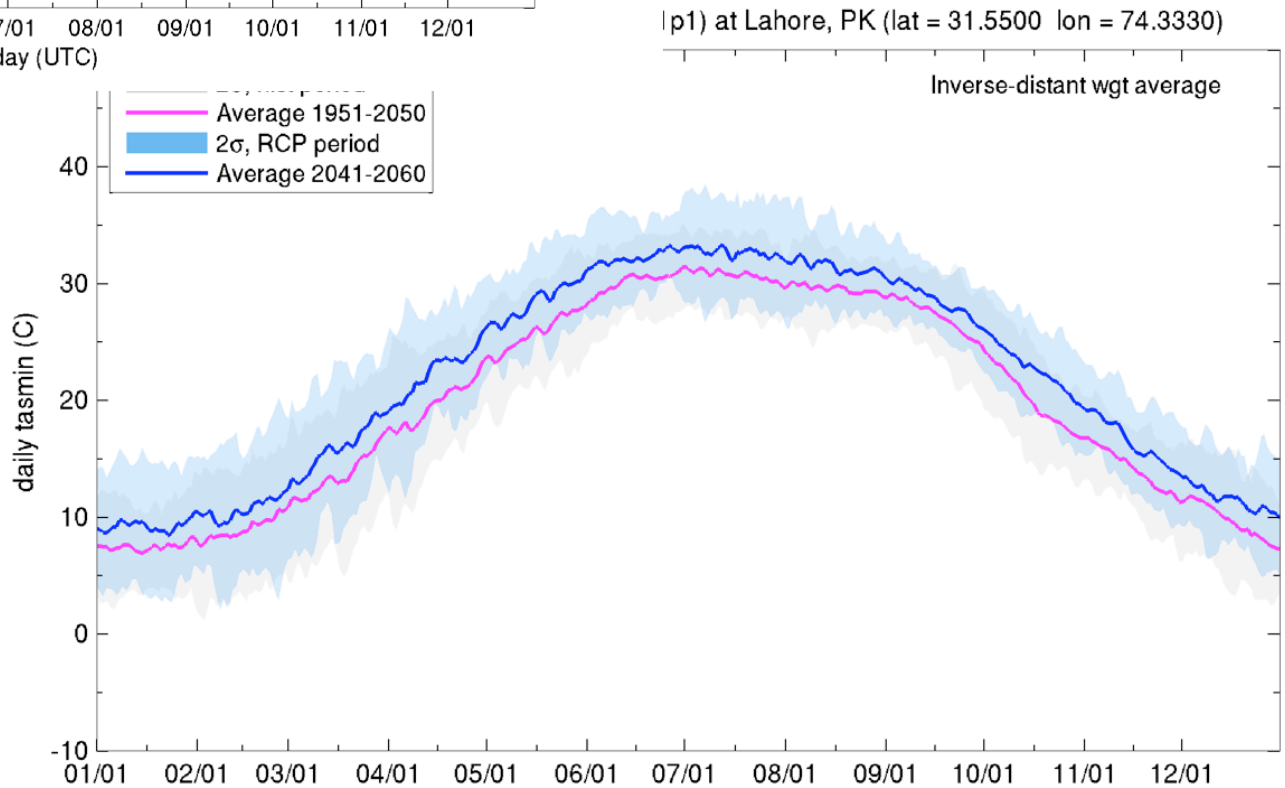
HABIB COLONY, RAWALPINDI

- Pucca, semi-finished houses with the majority being 15-20 years old
- Nallah
- Solid waste and debris
- The streets are paved yet eroded

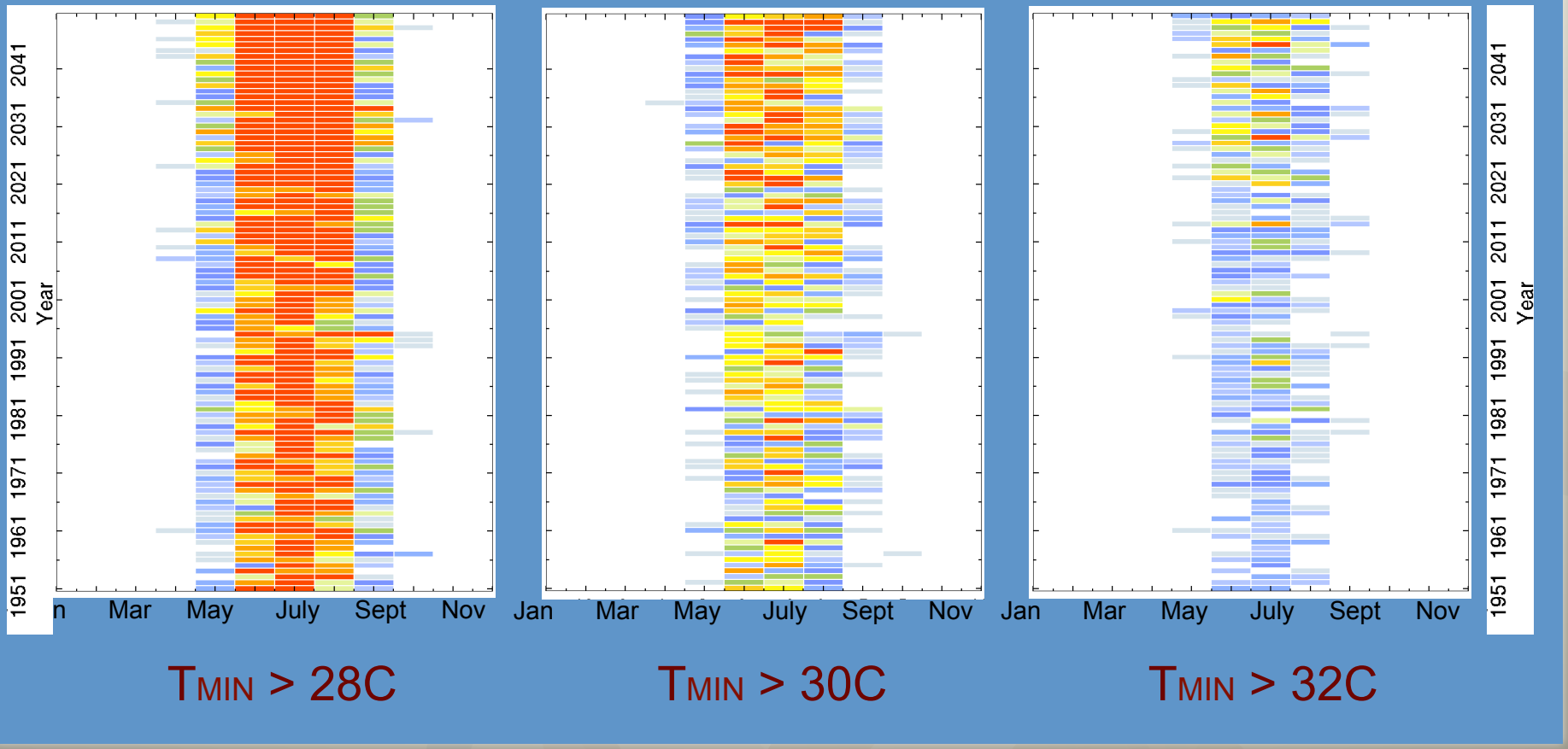

TMAX climatology from CCSM4 (histRcp, r1i1p1) at Lahore City, PK (lat = 31.5500 lon = 74.3330)
2σ, hist period
Average 1951-2050
2σ, RCP period
Average 2041-2060
Inverse-distant wgt average
60
50
40
30
20
10
01/01
02/01
03/01
04/01
05/01
06/01
07/01
08/01
09/01
10/01
11/01
12/01
month/day (UTC)

T-Max

T-Min


p1) at Lahore, PK (lat = 31.5500 lon = 74.3330)
Inverse-distant wgt average
Average 1951-2050
2σ, RCP period
Average 2041-2060
daily tasmin (C)
40
30
20
10
0
-10
01/01
02/01
03/01
04/01
05/01
06/01
07/01
08/01
09/01
10/01
11/01
12/01

#Days with TMIN above Threshold Lahore City, Pakistan

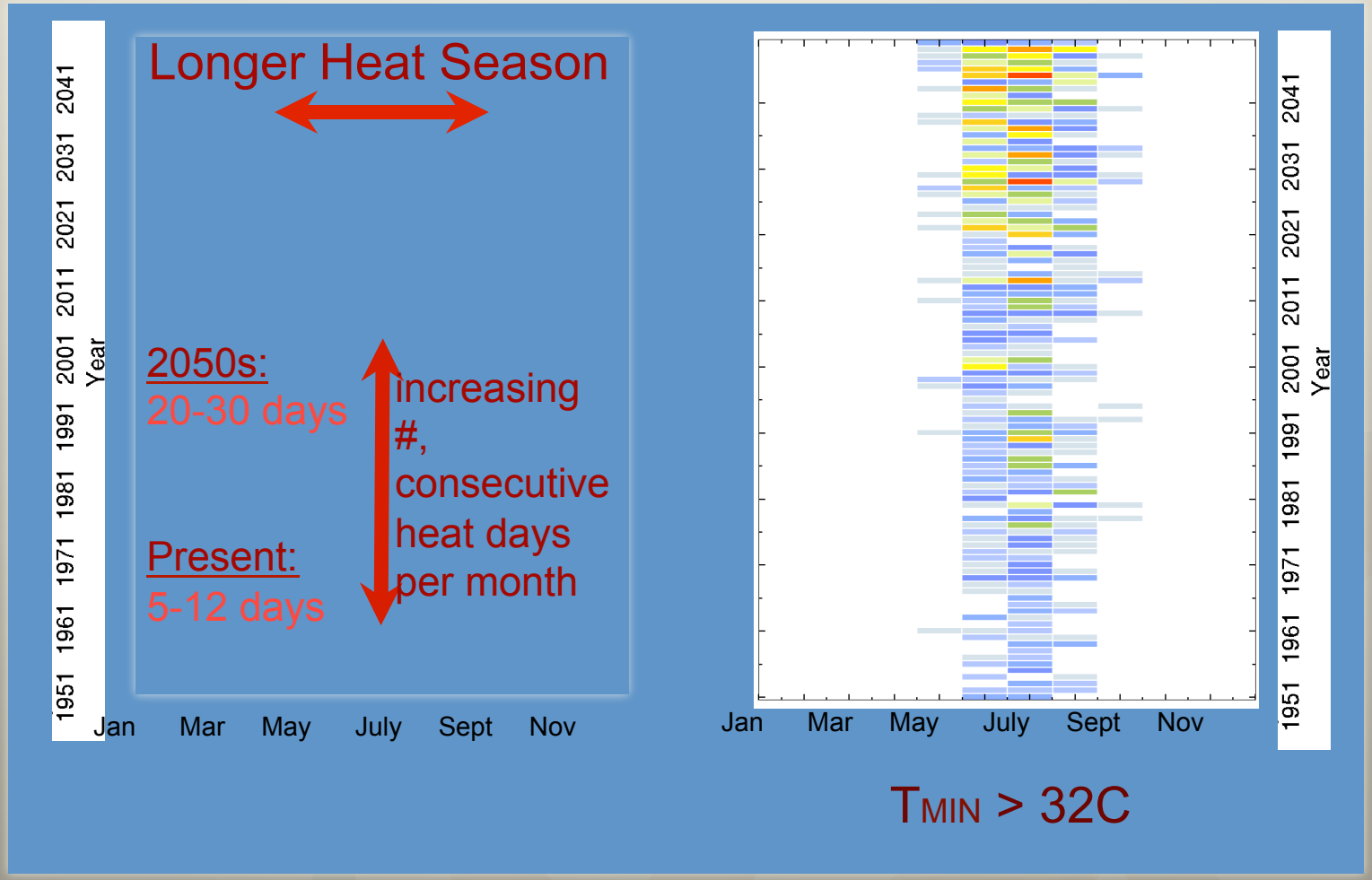


TMIN > 28C

TMIN > 30C

TMIN > 32C

#Days with TMIN above Threshold Lahore City, Pakistan

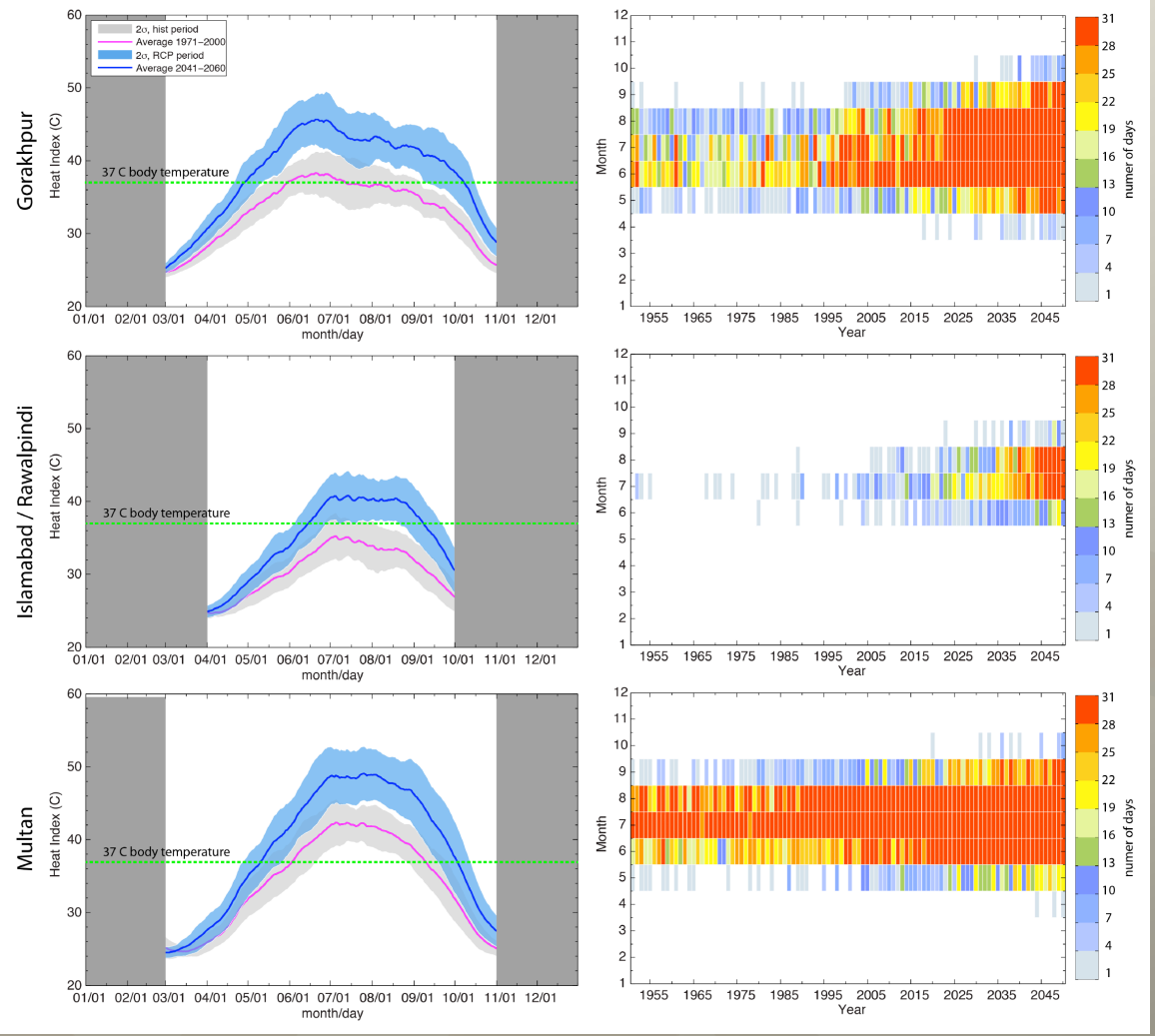


The Heat Index Threshold Issue

Fundamental challenge

Temperature index levels above body temperature for months with no break.

Adaptation requires
Active cooling or migration



Solution spaces exist

Floods and Storms – up to thresholds

The challenge Is social – adoption, who benefits, who decides

Problem spaces are major

Temperature, particularly daily minima are critical

Solutions are partly technical as well as social – and don't yet exist

Innovation required

The power of concepts

Resilience is about systems and their behavior

Values are what we use that knowledge for

www.iset-international.org

Weds, Session 93, Joffre 1-1 14:30-15:30
Putting poverty at the heart of Urban Climate Resilience

ISET

MANY THANKS!

For more information, please visit:

www.i-s-e-t.org

http://training.i-s-e-t.org