



**CLIMATE
ADVISERS**



RECOVERY, RENEWAL, RESILIENCE

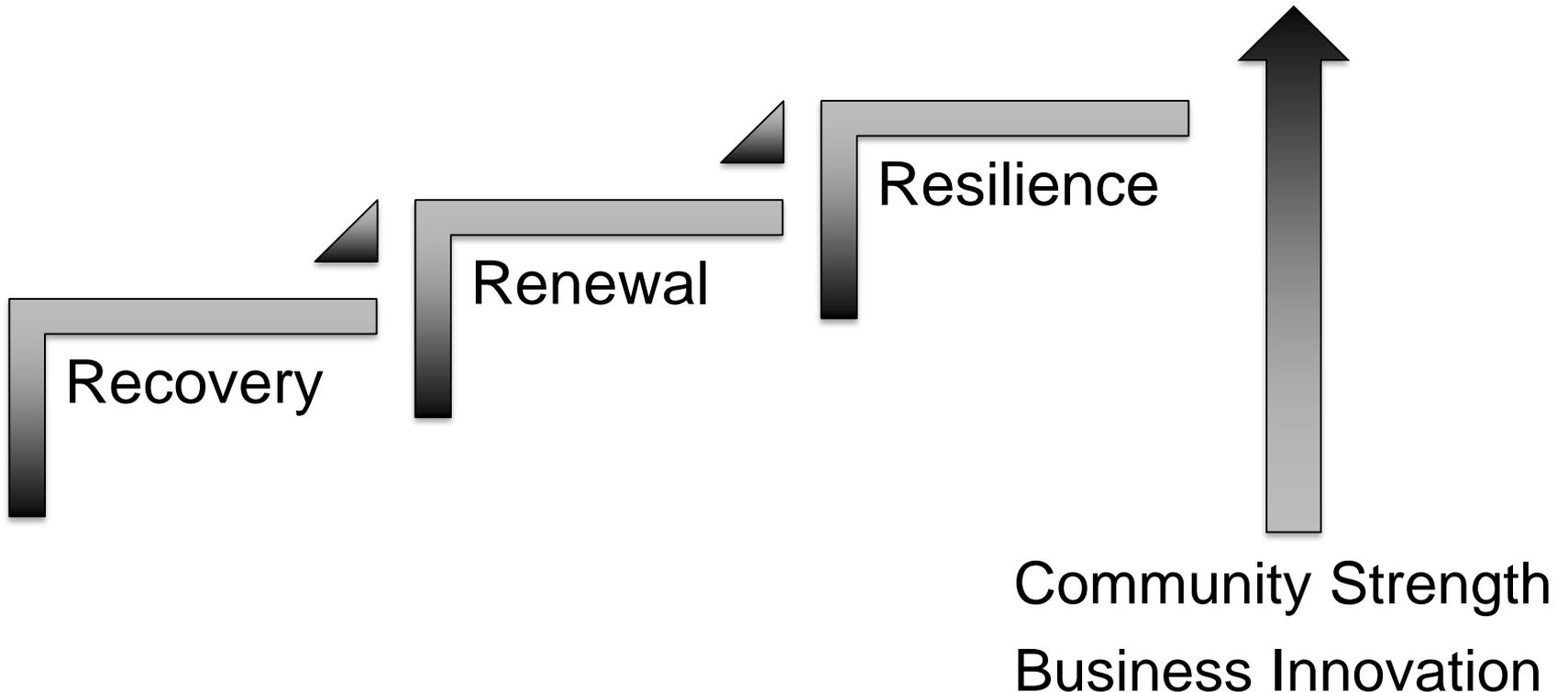
U.S. VIRGIN ISLANDS – MARCH 8, 2018

Recovery, Renewal, Resilience

Recovery: Returning to a previous condition

Renewal: Restoring to a healthy condition from a previous condition

Resilience: Power to forecast risks, plan for them, and recover and renew quickly



Three Stages

- Recovering from Hurricanes Irma and Maria
 - Takes time
 - Depends on community's needs and resources available
- Renewal
 - Disaster relief
 - Corporate donations / support
 - Civil society
 - Economic transition
- Resilience to support an economy that can withstand future events
 - Lessons learned
 - Strategic principles
 - Scenarios to determine strategic options
 - Competitive advantage
 - Act on strategy

Hurricanes Irma and Maria Impacts on U.S. Virgin Islands

- Community stress
 - Many deaths and injuries
 - Social disruption and emotional trauma
 - Challenges ideas of “is home safe?” and “where is home?”
- Infrastructure stress
 - 90% of buildings damaged or destroyed
 - 13,000 buildings lost their roofs
- Financial stress
 - Caa3 rating Government of U.S. Virgin Islands
 - Tourism economy
 - Economic community focus on surviving before innovating and growing

Overwhelming

Short-Term Risks	Medium-Term Risks	Long-Term Risks
Liquidity in light of timeliness of FEMA reimbursements and adequacy of reserves	FEMA reimbursements for major infrastructure projects	Economic and revenue stimulus from rebuilding spending
Cleanup costs	Timing of FEMA aid	Potential for population loss and decline in taxable value
Upcoming debt service payments		Impact on real estate values

FEMA Risks. Source: Moody's Investor Services.

Other Communities Faced Similar Situations

Three tourism-dependent communities

- Hurricane Iniki, Kauai, Hawaii 1992
- Hurricane Katrina, New Orleans, 2005
- Hurricane Sandy, New York, 2012

What are the lessons learned from their recovery, renewal, and resilience processes?

Hurricane Iniki, Category 4, Kauai, Hawaii, 1992

- Recovery
 - Ten plus years \$3.1 billion damage, six deaths, 12,000 homes damaged
- Renewal
 - All 50,000 Kauai residents suffered, 33% homeless, “walking wounded”
 - Five years later tourism was 25% less than before
 - Depressed real estate prices, private sector rebuilding but too expensive, agriculture system changed, land and sea (ecological) losses depressed wealth
- Resilience lessons learned
 - Community engagement
 - Long-term underemployment and unemployment occurred
 - Capital flight, restructured economy, did not embrace new internet driven solutions
 - Set stage for 100% renewable energy by 2045 by Hawaii and local agriculture

Hurricane Katrina, Category 5, New Orleans, 2005

- Recovery
 - \$150 billion economic impact, killed over 1,500 people
 - Entergy Corporation (utility) required \$100 million
 - 7 million gallons oil spill and numerous toxic chemical releases
- Renewal
 - Decline of New Orleans key economic engine as port city
 - Neighborhoods devastated still
 - Community connectivity shattered
- Resilience lessons learned
 - Must strengthen natural environmental buffers
 - Need to plan for simultaneous disasters
 - Businesses must incorporate risk management into daily management
 - Requires clarity between who responds: feds, state, local, civil society?

Hurricane Sandy, New York City, 2012

- Recovery
 - \$75 billion in damages, largest on record, 285 people died along hurricane path
 - Significant impact in NYC, millions without power, NYC economy shutdown
- Renewal
 - Local solutions empowered
 - Embracing disruptive technologies e.g. solar, bicycle, local agriculture
- Resilience lessons learned
 - Crisis management is different than routine emergency
 - Cognitive bias
 - Overweighing one's experience "been there, done that"
 - Illusion of grandeur, of "beating the storm", "can beat the next one"
 - Failure to observe or believe non-conforming evidence
 - Making objectives personal and not strategic
 - Doubling down on previous commitments, not embracing new solutions

Lessons Learned: Summary

- Personal preparedness is key, if individuals prepared, economy may be resilient?
- How will business executives prepare for the next storm?
- Need competing facilities? Competing energy systems?
- Untested recovery strategies may not work?
- Anticipate infrastructure damage: transport, food, energy, business, community?
- Economy suffers damage during the storm and in the aftermath?
- Strategy needs to be forward thinking, test scenarios, embrace innovation?

Iniki 1992

Katrina 2005

Sandy 2012

- Pre internet
- Reactive response
- Land / water / ag impacts not considered
- Community not engaged

- Pre coworking / collaborative economy
- Storm modeling not included in building codes
- Community not engaged

- Pre systems modeling
- Energy systems not modeled
- Community engaged

Resilience: Plan Today for the Future You Desire?

- What is your process?
 - Talk to the community
 - Determine lessons learned
 - Develop strategic principles
 - Create scenarios to determine strategic options
 - Embrace innovation
 - Act on strategy

Resilience: Developing Strategic Guiding Principles?

- Does the community want to create “strategic guiding principles”?
- What are the “strategic options” for the community?
 - Do nothing
 - Return to prior state
 - Develop strategic plan for the future that includes scenarios

Resilience: Developing Scenarios to Determine Options?

- With strategic guiding principles (e.g. control over energy costs), does community want to develop scenarios to determine options?
 - Design “what-if” scenarios-based analysis
 - Test “what-if” scenarios
 - See what “what-if” scenarios create which solutions aligned with guiding principles
 - Seek community input and business innovation solutions

Resilience: Strengthening Local Capacity?

- Do you want to strengthen local capacity to use guiding principles, test “what-if” scenarios and options, all to enable innovative community solutions?
 - Energy independence and freedom
 - Profit from local agriculture
 - Strengthen and diversify U.S. Virgin Islands economy
 - Small-medium enterprise innovation
 - Restore land and oceans so they protect the community
 - Develop resilience expertise so U.S. Virgin Islands are global experts / consultants

Resilience: Transitioning from Today to Your Future?

- How do you want to transition from current state to better future state?
 - How does the community execute its strategic plan?
 - How does Federal funding empower community to achieve strategic plan?
 - What are the gaps in Federal funding to achieve strategic plan?
 - How can current financial stakeholders empower the community?
 - How can businesses provide pro-bono tested and innovative solutions in U.S. Virgin Islands to grow local capacity and empower local small businesses?

Resilience: Conversation Starters?

- Align funds with guiding principles, scenarios, local capacity and transition strategy
 - Why? Decrease long-term costs to community to improve resilience
- In \$715 million spent on schools, include:
 - Local agriculture to supply schools? 100% renewable energy? Water reuse on site?
 - Sustainability innovation centers so students gain business skills?
- In \$425 million on transport, include:
 - Multi-modal transport with zero emissions - bicycles? Heavy duty electric vehicles and maritime electric transport?
- In \$1.8 billion on housing, include:
 - Low emissions strategies, onsite water mitigation, community gardens
- In \$850 million in energy, include:
 - 51%+ renewable energy target by 2025 (VIB 9 2009)
 - If Hawaii can go 100% by 2045 and Atlanta 100% by 2035, USVI can go...?
 - Ecosystem restoration to improve “reef to land to table” nexus
 - Repricing current public debt because of extreme circumstances

THANK YOU.

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