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Decision Maker and Stakeholder Preferences for Adaptation Actions and Finance: Case Studies in Brazil, USA and UK

USF UNIVERSITY OF SOUTH FLORIDA
COLLEGE OF MARINE SCIENCE

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ADAPTATION FUTURES 2016
practices and solutions

Coastal Vulnerability Research Initiative 2014-2017
Funders and Research Team

BELMONT FORUM

USA

NSF

USF UNIVERSITY OF SOUTH FLORIDA COLLEGE OF MARINE SCIENCE

GEI Consulting Engineers and Scientists

APA FL American Planning Association Florida Chapter

UK

NERC SCIENCE OF THE ENVIRONMENT

E·S·R·C ECONOMIC & SOCIAL RESEARCH COUNCIL

KING'S College LONDON

BRAZIL

FAPESP

UNICAMP

IG INSTITUTO GEOLÓGICO

USP Universidade de São Paulo

Cemaden Centro Nacional de Monitoramento e Alertas de Desastres Naturais

INPE

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The METROPOLE Research Team

USA PROJECT PI Dr. Frank Muller-Karger, CJ Reynolds, Karen Langbehn (USF); CO-I Dr. Sam Merrill, JT Lockman, Alex Gray (GEI Consultants); Dr. Jack Kartez (EPA New England Finance Center); Alex Magee (American Planning Association-Florida)

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(Red = Survey Team)

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METROPOLE Advisory Board

Eternal gratitude for their brilliant ideas, advice, contacts and collaborative spirit

Climate UK – Kristen Guida

Eastern Solent UK Coastal Partnership – Gavin Holder

National Oceanic & Atmospheric Administration – Heidi Stiller

APA Florida – Henry Bittaker

State of Florida Dept. of Community Resiliency – Julie Denis

Broward County, FL, USA – Jason Liechty

Municipal of Santos, BR – Eduardo Kimoto Hosokawa

And many others

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METROPOLE Collaborating Communities

Brazil: Santos, Sao Paolo

USA: Dania Beach, City of Hollywood, & Ft. Lauderdale, FL

UK: Selsey, West Sussex

Criteria: Small, medium or large.

On the Coast. At risk.

WILLING!!!

BROWARD COUNTY FLORIDA

Dania Beach

Santos

SELSEY TOWN COUNCIL

Participating Communities

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METROPOLE Research Objectives

Stakeholder engagement workshops, co-produce regionally accepted SLR forecasts, vulnerability assessment for infrastructure, model costs/benefits of defined adaptation options using the COAST tool and approach (created by Merrill et al)

Implement surveys and interviews to analyze:

1. How **values of *decision makers influence*** receptivity to scientific/economic data and scenarios, and build flexible governance approaches;
2. How *informed stakeholders* perceive and respond to locally-specific climate risks, economic impacts and adaption options presented in visualizations;
3. **Decision making tradeoffs about costs, risk and public good for defined adaptation options, and willingness to support actions;**
4. Regional adaptive capacity – institutional factors that support ability to adapt and to mobilize toward change. **(Thursday 8:45-1030 SC 9.12 Local Governance of Adaptation in Urbanizing Cities – Paterson/Pelling.)**

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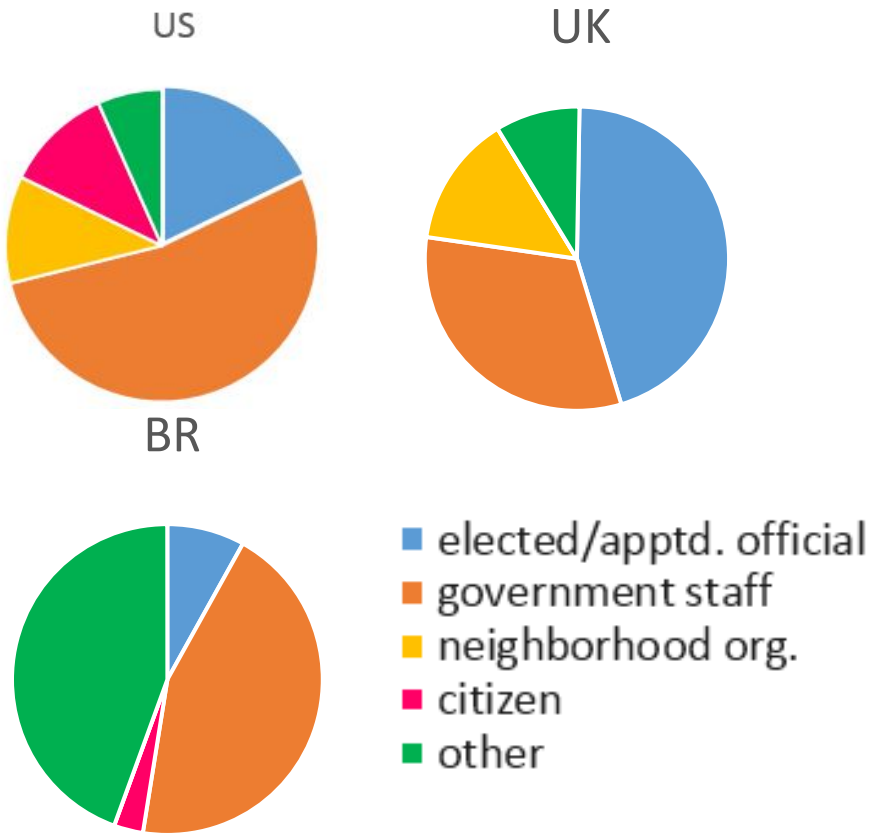
Participant – Self Defined Roles and Demographics

Local Decision Makers and Influencers = First Line of Stakeholders

Educated (86%-94% have degree) Majority HH Income is above median in US/BR,

Mix of political affiliations. NEP moderate to strong bias toward pro-enviro values, slightly lower in the UK



US	UK	BR
53% Male 47% Female	59% Male 41% Female	61% Male 39% Female
48% 55+ 30% 35-54 12% 35-25	68% 55+ 27% 35-54 5% 35-25	22% 55+ *47% 35-54* *31% 35 -25*
87% White 11% Black 2% Hispanic	91% White 9% no answer	83% White 14% Parda* 3% Indian, Native American

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Project Timeline and Process

- COAST workshops conducted Jan-Dec 2015
- Final survey data entered/coded/scrubbed Jan-April 2016
- Analysis Jan-July 2016
- Presentations to municipal contacts – summer 2016
- Co-analysis of survey and ACI with American Planning Association-Florida workgroup summer 2016
- Support development of guides and professional education webinars

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Survey Design & Implementation

Categories of Questions

1. Experience with coastal hazards
2. Planning Priorities for Local Government -- which adaptation options & when
3. Perceptions about Barriers – why others won't support adaptation
4. Agreement – should adaptation be priority for Local Gov. even if taxes/fees increase?
5. *Acceptability* of specific local public finance mechanisms
6. New Environmental Paradigm (NEP) value study
7. Demographics

Implemented

Pre Workshop 1 & Post Workshop 2

New participants -- beginning/end of #2

Workshops	US	UK	BR
#1	50	22	36
#2 Returning	12	9	12
#2 New Participants	18	2	9

Validated surveys

* Q#3 derived from I. Lorenzoni

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What Should Your Government Do…..
Adaption Planning Actions and When

Q4. There are a variety of programs and actions a city or county could implement to reduce the potential for physical and economic damage caused by climate-related hazards. Which planning activities or programs do you think your local government(s) should implement, and when?

Categories (14-16 Options)

1. Land-use policy changes
2. Nature-based options
3. Green flood reduction tech
4. Infrastructure – raise/build sea wall, pumps, canals, levees
5. Buy outs – residents or business

Decide When or IF for Each Option

Now, 10, 25, 100 Years

Never, Unsure

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Similar Patterns Across the Countries

+++ Highest support *NOW* …. Restrict New Development and Conserve Existing Wetlands

++ Strong support *NOW* … Restrict REBUILDING, Increase Wetlands, Use green tech to reduce floods/stormwater

+ Strong support for Renourish/build dunes, *except in BR*

+/- Mixed views for structural solutions and buy-out policies for vulnerable residents/businesses

low NOW and spans all times …never and unsure

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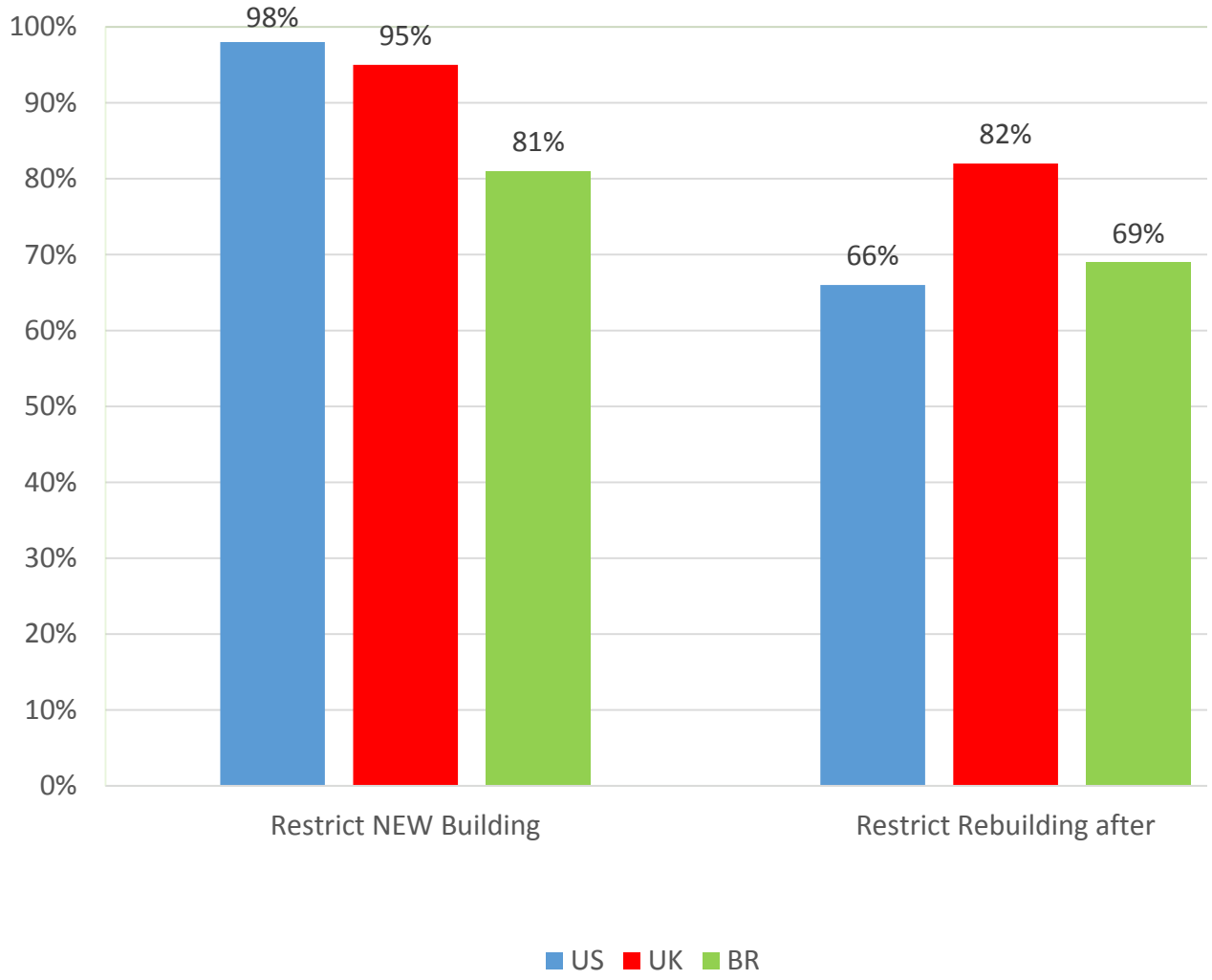
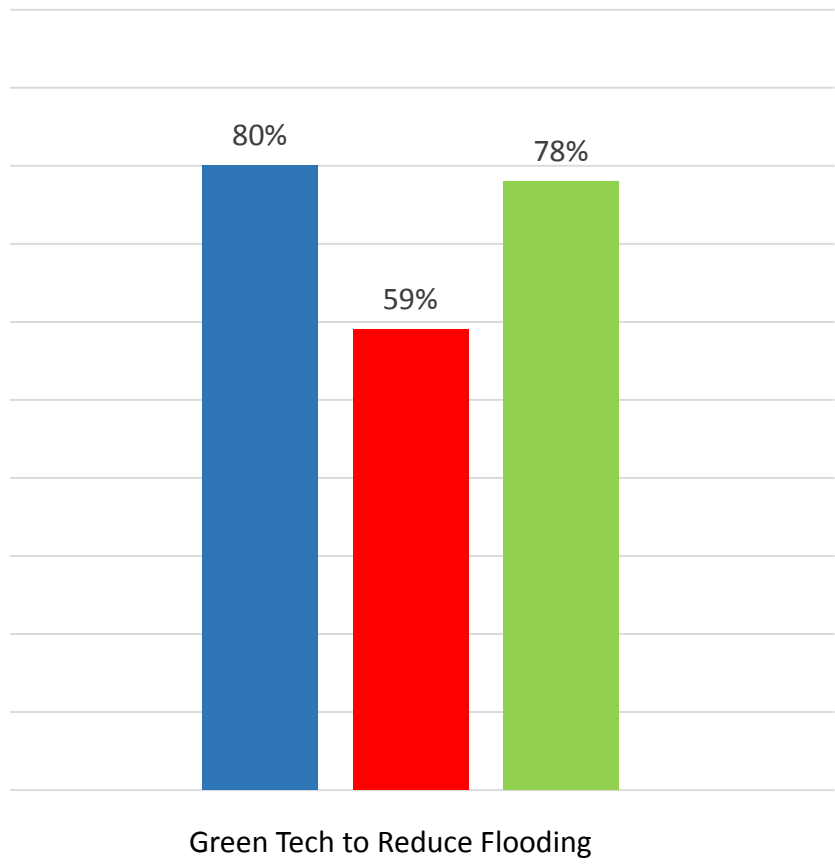
Land-Use Policies % Now



Green Tech % NOW



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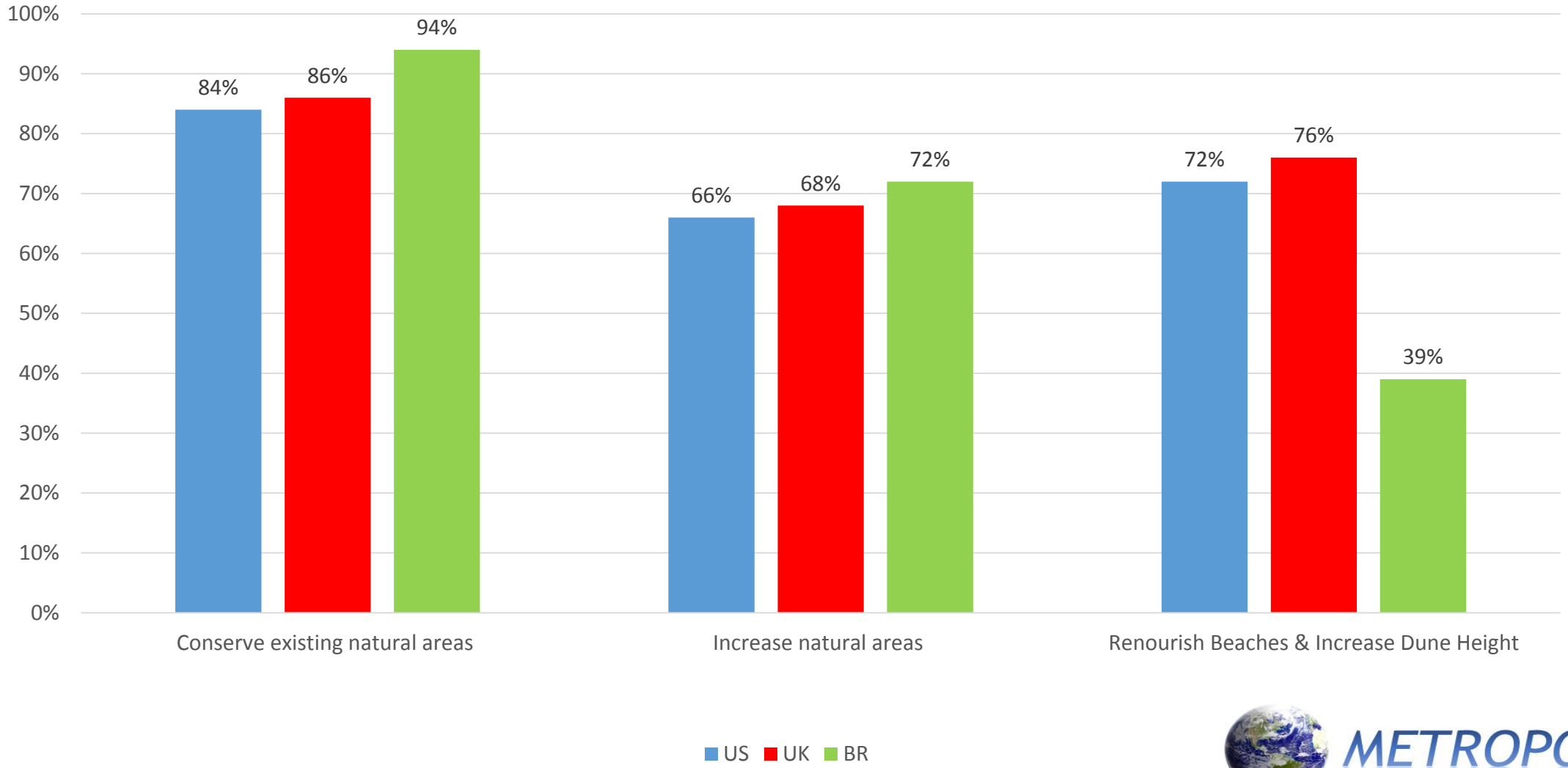
Nature-based Options % NOW



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Hard Infrastructure Adaption Options

Each country spans mixed timeframes

Workshops increased *awareness* of local risks, conditions and needs

Pre/Post responses shift for each option --- reflects new understanding

Pre Workshop 1: Build or Increase Height of Seawalls

	now	10 years	25 years	100 years	never	unsure
US	50%	20%	8%	---	8%	10% (*no ans: 4%)
UK	18%	36%	14%	5%	5%	--- (*no ans: 23%)
BR	42%	19%	11%	5%	8%	8%

Sea Wall Example: Post Workshop 2 Responses
US time urgency decreases – wall not a viable option
UK time urgency **INCREASES** – need to increase height
BR time urgency decreases NOW, shifts to 10 years….

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Adaptation Options – Take Aways

Small data sets but very interesting common patterns

Prioritized “Now” Options

- Similar preferences in each country
- Appeal to different values (nature or perception of effective/low cost)
- Can offer multiple benefits

- Hard infrastructure -- Post Workshop 2
  - Shifts in time (priority) reflects new awareness of local conditions
  - Concerns about incomplete risk/cost picture
- Buy-outs
  - Need to complete our analysis

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Acceptability of Public Finance Mechanisms

Q6. (Paraphrased)…Consider possible finance actions a local government could take and rate the level of Acceptability (1= Not Acceptable to 5 = Totally Acceptable)

Standard categories for each country – customized to local finance and policy frameworks…

Selsey UK Version

A. Create a new town-wide defence fund which is generated by either a 5% increase on Council Tax Bills or a flat fee across all properties
B. Create a new special resilience "district" encompassing highly vulnerable properties and apply a 5% increase on Council Tax Bills or a flat fee to that area
C. Issue a bond (long-term borrowing) to finance public infrastructure flood improvements
D. Create a low-interest loan program for residents and businesses to flood proof properties
E. Initiate public-private partnerships to attract development to the area that will contribute to coastal defence through a community infrastructure levy

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Acceptability of Funding Sources At a Glance

POST WORKSHOP 2, Order of Rating, Returning Participants

More Acceptable

Less Acceptable

US	UK	BR
Special resilience district	Special resilience district	Special resilience district
Low-interest loans for flood proofing	Town-wide defense fund	Issue bonds
Issue bonds	Public-private partnership	Low-interest loans for flood proofing
County-wide resilience fund based on property taxes	Low-interest loans for flood proofing	County-wide resilience fund based on property taxes
Surcharge on water bill	Issue bonds	Surcharge on water bill
		Raise sales tax

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Acceptability of Funding Take-Aways

Highly "acceptable" financing mechanisms will have alignment between fiscal benefits and burdens

Need to understand links/implications between values, options and finance policy

- Strong support for "Restricting rebuilding after damage" BUT *mixed support* for "buy-outs of vulnerable properties"

U.S. insights (BR/UK analysis in progress)

- ***RANK ORDER of Finance Options is the same for all political affiliations***
- Ratings are higher for Democrats and Independents, than Republicans
- Are ratings high enough to win support? Highest UK = Special Resilience District: Totally: 38% Highly 43:% Moderately: 5%, Somewhat: 5%

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Basic Planning Recommendations

Know which funding mechanism (and their limits) can support which adaptation options

- Decision makers and stakeholders need a sense of budget scale tied to time

Effective adaptation plan and options will include:

- nature-based actions and green design/technologies
- incremental and/or phased strategies that offer multiple and diverse benefits
- prioritized list of strategies required to implement… change policy, revise finance, design steps and construction

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Questions

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