UN Office of Disaster Risk Reduction Alliance for Risk-Sensitive Investments' Natural Infrastructure Typology

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ENVIRONMENTAL DEFENSE FUND™

Finding the ways that work

UNAR!SE Participants

Duke University
Environmental Defense Fund
GEI Consultants, Inc.
The Nature Conservancy
Blue Moon Fund
American Society of Civil Engineers
University of Connecticut
Shell Global Solutions Inc
U.S. National Oceanic Atmospheric Administration
Conservation International
Coastal Resources Management Council
EcoAdapt
U.S. Business Council for Sustainable Development
Connecticut Institute for Resilience and Climate Adaptation
United Nations Office for Disaster Risk Reduction
Restore America's Estuaries
Connecticut Department of Environmental Protection
U.S. Environmental Protection Agency
Entergy
U.S. Army Corps of Engineers
PricewaterhouseCoopers LLC
Water Institute of the Gulf
ARCADIS Inc
Waterfront Alliance
State of Rhode Island

Financiers

Need to have the financing to pay for GI projects:

- Who pays for implementing?
- Does finance community value the investment?
- Is solution cost effective?
- Are projects viewed as mitigation or adaptation?
- How do you calculate ROI?

Scientists/Engineers

Need to have the right engineered solutions:

- Is solution technically feasible?
- Is solution better than traditional alternatives?
- Does it achieve resilience objectives?
- Is solution replicable and scalable?
- Do stakeholders understand benefits?

Insurers

Need to see value of insurance transfer:

- Does solution adequately reduce risk?
- Can insurance industry appropriately price?
- Is risk mitigation fully appreciated?
- Does society sufficiently recognize value?
- Does solution work?

Reveal Scale

- Ecosystems Based Adaptation (EBA)
- Eco-based Disaster Risk Reduction (Eco-DRR)
- Green Infrastructure (GI)
- Green/Grey Infrastructure (G-GI)
- Hybrid Infrastructure (HI)
- Living Shorelines (LI)
- Natural Capital (NC)
- Nature and Nature-based Features (NNBF)
- Natural Defenses (ND)
- Natural Infrastructure (NI)
- ….

Natural Coastal Infrastructure (NCI)

Sample Description

Step 1 –
Define understanding

OFFSHORE REEFS- CORAL

DEFINITION

Coral Reefs are underwater structures resulting from cementation processes and the skeletal construction of corals, calcareous algae, and other calcium carbonate-secreting organisms. Coral reefs are naturally occurring in tropical waters and provide coastal pro

Healthy cor

the reefs th

SITE SELECTION & PERFORMANCE

Feasible Conditions

Shallow coral reefs are present in in clear, warm subtropical and tropical waters. Shallow coral reefs grow best in warm water (70–85° F or 21–29° C). Reef-building corals generally grow best at depths shallower than 70 m (230 feet,) in clear water conditions with the most diverse reefs occupy depths of 18–27 m (60–90

Constraining Factors

BENEFITS & COSTS: ECONOMIC, ENVIRONMENTAL, AND SOCIAL

Benefits

From an economic perspective, high value is gained through the collection of fish and invertebrates in coral reef ecosystem (Chong 2005). Of the $29.8 billion global net benefit of coral reefs, $9.0 billion is accounted for by the coastal protection coral reefs provide.(Cesar et al. 2003). Restoring reefs has been found to be is significantly cheaper than building artificial breakwaters in tropical environments (Ferrario et al 2014). This is consistent with recent analyses from the re-insurance industry on the economics of climate adaptation

Costs

OPERATIONAL & GOVERNANCE CONSIDERATIONS

Scalability and Replicability

On a spatial scale, coral reefs range from 10s to 100s of miles/kilometers in area. The limiting factors documented for coral reef system indicate that maintenance/restoration and enhancement of current naturally-occurring systems is appropriate, while replication in new locations may have limited success.

Operations, Maintenance, and Monitoring

Training Required

ADDITIONAL CONSIDERATIONS

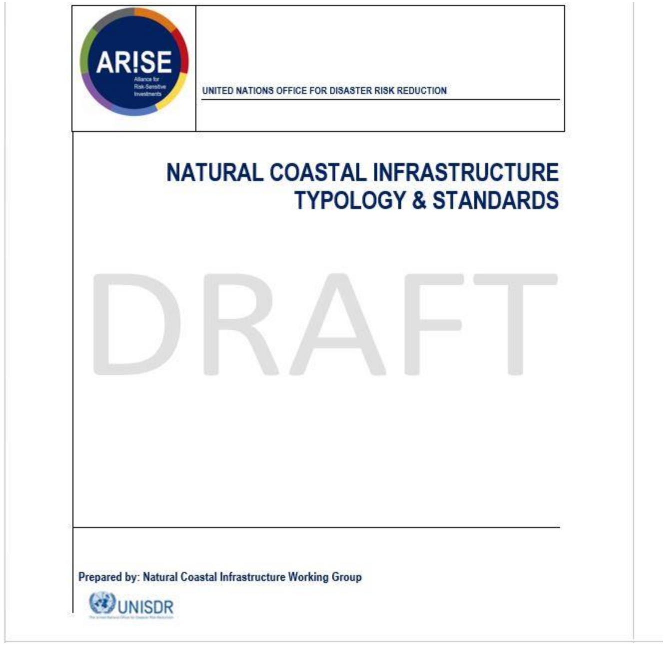
Governance and Regulation

Land-based conservation measures such as watershed management and integrated developr should be implemented to support coral reef conservation and restoration efforts (NOAA 2015

What’s next?

- Final drafting
- External peer review

  or maybe?



ARISE

UNITED NATIONS OFFICE FOR DISASTER RISK REDUCTION

NATURAL COASTAL INFRASTRUCTURE
TYPOLOGY & STANDARDS

DRAFT

Prepared by: Natural Coastal Infrastructure Working Group

UNISDR

Other efforts…

- USACE proposing multi-sectoral, multi-disciplinary effort
- EDF workshop