



Enhancing urban regeneration and spatial justice with Nature-Based Solution

NBS as a pragmatic tool for disaster management cycle in earthquake risk.

Critical issues and opportunities in the planning of emergency housing areas in Italy

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NBS for disaster risk reduction



IUCN Global Standard for Nature-based Solutions
A user-friendly framework for the verification, design and scaling up of NBS
First edition

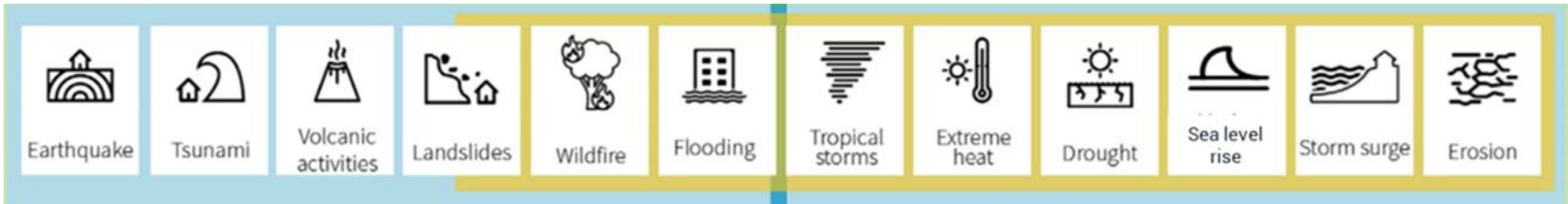
IUCN 2020
International Union for Conservation of Nature



Ecosystemic approaches and the hazards they address

Eco-DRR Ecosystem-based disaster risk reduction (UNDRR 2020)

EbA Ecosystem-based adaptation (IUCN 2020)



non-climate hazards

(Source: UNDRR/UNU-EHS)

climate-related risks



Sendai framework for disaster risk reduction

2015-2030

How NbS contribute to Priority 4

Enhancing disaster preparedness for effective response and to "Build Back Better" in recovery, rehabilitation and reconstruction

Including **planning** approaches and **social** and **environmental** attention in post-earthquake recovery contexts through **build back better** and **greener** can help invert this trend

In Italy

Italian risk management policies are not oriented towards planning and prevention, but toward public emergency actions based on economic compensation and physical restoration of individual assets, with very high costs and social, environmental and cultural repercussions on the territories

NBS in the disaster management cycle



Early recovery: necessary to guarantee temporary houses, services and sufficient quality of life for people

This phase management affects the costs or benefits of the territory

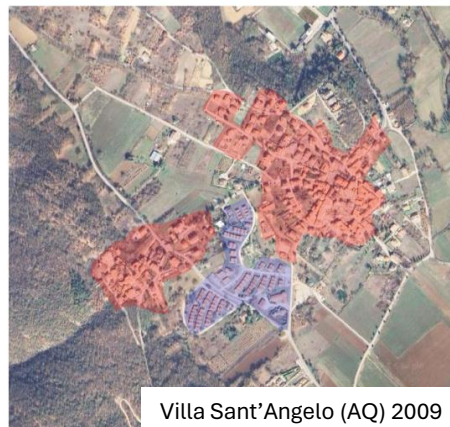
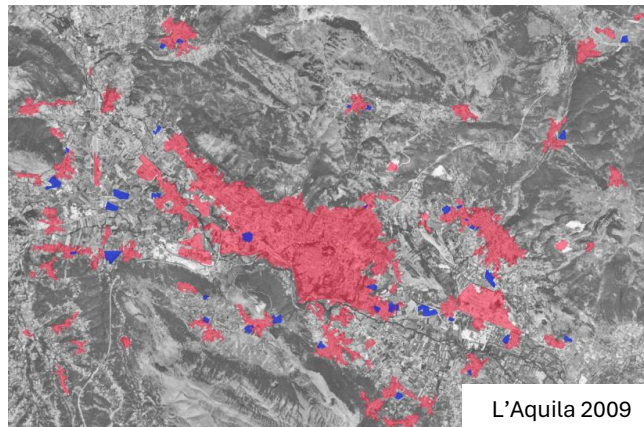
Urban, social and environmental challenges

- Wrong / inadequate choices of the areas for temporary housing
 - Urban sprawl
 - Alteration between historical cities relations
 - Settlement displacement
- Soil use / land cover change
 - Biodiversity loss, habitat fragmentation
 - Urban densification and reduction of urban green spaces
- Poor quality temporary buildings
 - Challenge human well-being and health



In Italy

No national guidelines regulate these areas identification. They are selected in emergency phase on the basis of geological criteria only

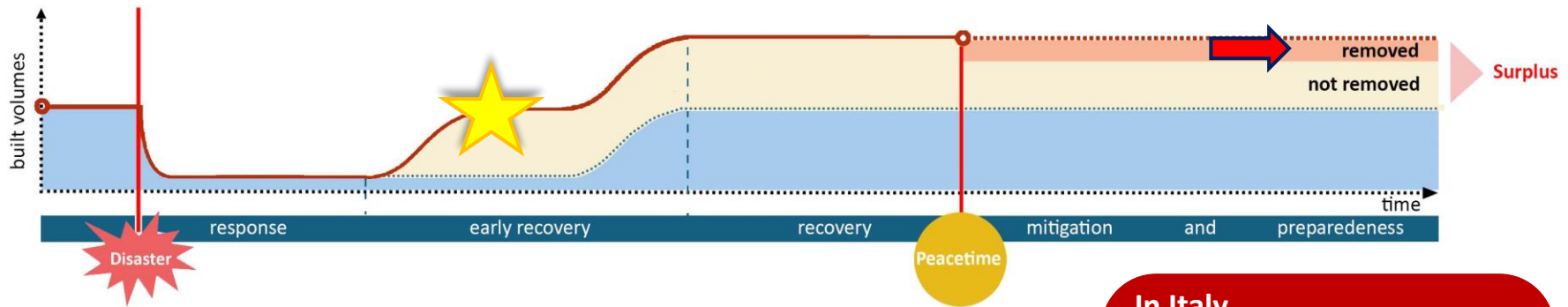


Existing city

Temporary city

Emergency temporary dwelling in Italy

Conventional emergency dwelling and planning response to earthquakes



Modified from E., Sargenti (2017).

Emilia-Romagna 2012
Removable modules PMAR
(Prefabbricati modulari abitativi removibili)

In Italy
Molise 2002: Not removed (22 years)
Abruzzo 2009: Not removed (15 years)
Emilia-Romagna 2012: Removed (3-5 years)
Centro Italia 2016: Not removed (8 years)

1. Removed



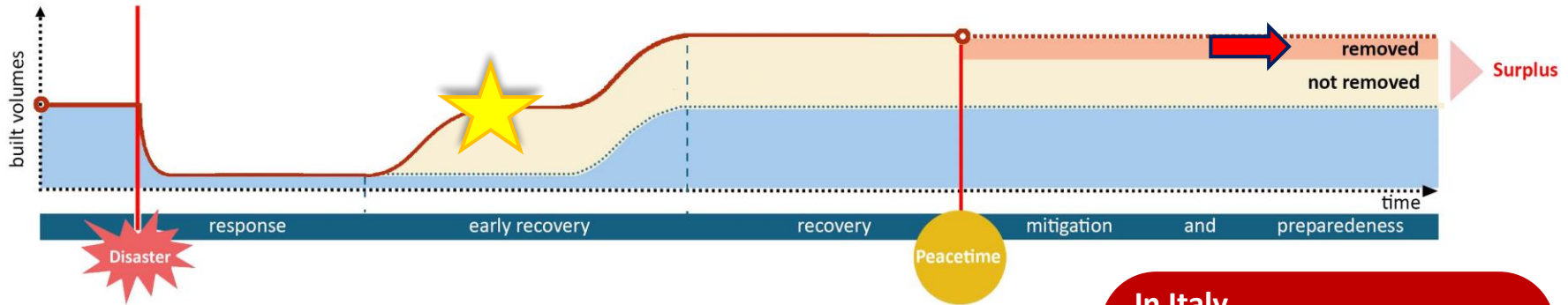
a) Not used / Not reconverted
2aa - Intentional greening and degradation of urban infrastructure



a) Not used / Not reconverted
2ab - Not intentional greening and degradation of urban infrastructure

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Mirandola (MO)

b) Used / Reconverted
2ba - New public use (not green)

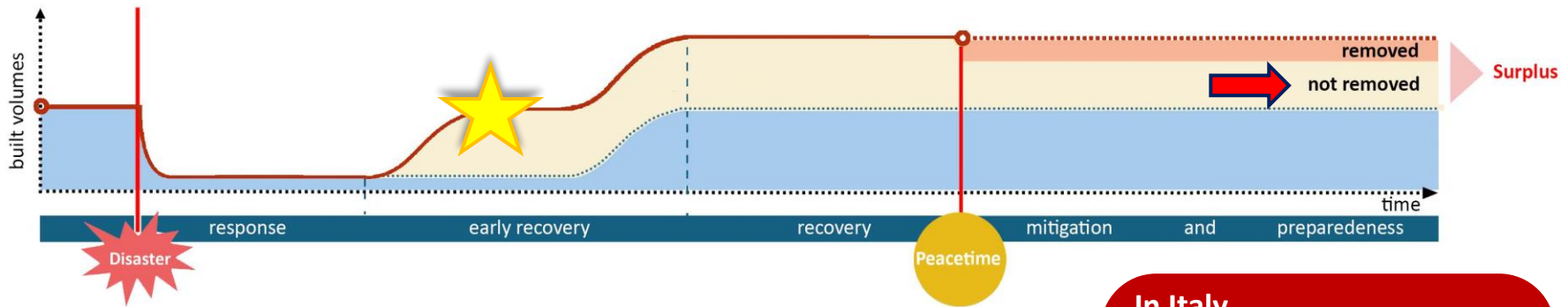


Rovereto sul Secchia (MO)

b) Used / Reconverted:
2bb - New green spaces

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Modified from E., Sargenti (2017).

2. Not removed

Abruzzo 2009
Not removed MAP
(Moduli abitativi provvisori)

In Italy
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Abruzzo 2009: Not removed (15 years)
Emilia-Romagna 2012: Removed (3-5 years)
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Cansatessa (AQ)

a) Not used / Not reconverted
1aa - Degradation and vandalism

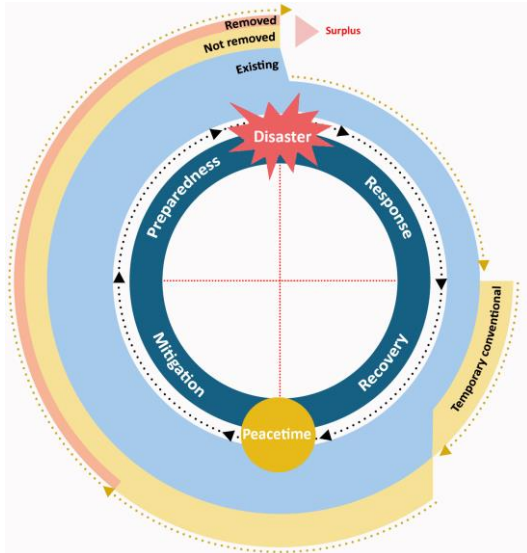


Villa Sant'Angelo (AQ)

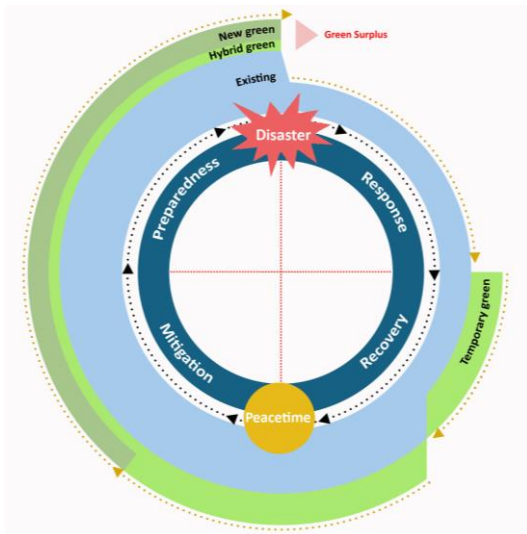
b) Used / Reconverted:
1ba - For public services and residential use

Post-disaster recovery planning for a “build back better and greener” opportunity

Solutions for **integrated settlement systems** with new **temporary but reversible** functions



Conventional Disaster Risk management approach



NbS Disaster Risk management approach

Phase	Time frame after hazard event	Objectives	Main actions	Ecosystem services privileged	Ecosystem-management component
Response	Hours to days after	Save lives	Search & rescue, emergency skills	Provisioning services	Avoiding dumping of hazardous materials in environmentally sensitive areas or habitats; possible use of provisioning services from ecosystems (food, wood, shelter, etc.)
Rehabilitation / Recovery	Days to months after	Secure livelihoods	Temporary shelters, provision of basic services, e.g. water, food	Provisioning, regulatory services	Rapid environmental assessments, sourcing of sustainable materials for recovery, waste management
Reconstruction	Months to years after	Reconstruct livelihoods	Reconstruction/ provision of housing and infrastructure, job creation	Provisioning, regulatory, supporting and cultural services	Environmentally sensitive reconstruction, sustainable materials sourcing, improved waste management, ecosystem restoration, green infrastructure and improved ecosystem management for DRR
Prevention					
a) Risk and vulnerability assessments	Continuously updated	Analyses and assess risk	Hazard and exposure mapping, vulnerability assessments, risk	Regulatory and provisioning services	Integrating ecosystems in risk assessments (see Priority for action 1)
b) Development planning and risk reduction	Continuous process, on regular intervals	Hazard, vulnerability and exposure reduction	Risk-sensitive land use planning, based on assessments	Provisioning, regulatory, supporting and cultural services	Ecosystem and land management plans, ecosystem protection and restoration included in planning and zoning (see Priority for action 3)
c) Preparedness	Continuously updated	Increase readiness for future hazard events	Creation and maintenance of early warning systems, evacuation plans	Regulatory and provisioning services	Including ecosystems in environmental emergency preparedness programmes

UNDRR (2021)

This approach needs a **strategic perspective** to make decisions without the pressure of a post-disaster scenario

World Bank (2021)

Building Solutions

Urban Farming

Open Green Spaces

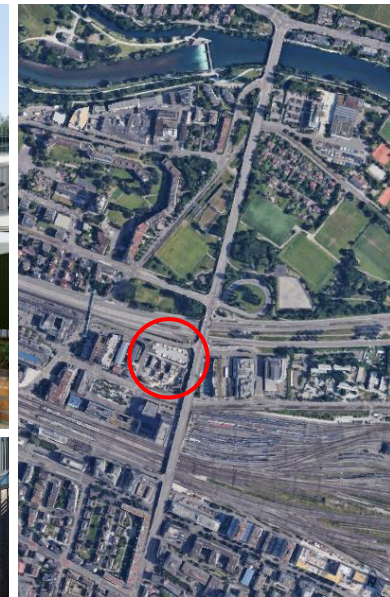
Bioretention Areas

Green Corridors

Good practices

FOGO - Zurigo

- Provisional use project (20 years) for students, refugees and travellers
- Wooden modules, volumes and open spaces developed together with the people who live on site or nearby
- Green areas planned with native vegetation considering also the public use of the space
- Cultural events, shopping/dining area, creative spaces, children's playground
- It also benefits the surrounding neighborhoods



“It’s not just about building houses, but homes.”

Thank you for your attention!

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