



Institutional and organizational framework for recovery megaproject triggered by major disaster event

Maja-Marija Nahod, Mladen Radujković



ALMA MATER
EUROPAEA
ECM

Geologically
related
disasters

Landslides and
Mudflows

Earthquakes

Dam failures

Dam Bursts and
Mine Fires

Water and
Climate
Related
Disasters

Floods and Drain

Cycones

Hailstorm

Tornadoes and
Hurricanes

Cloud Burst

Heat Wave and
Cold Wave

Snow Avalanches

Droughts

Sea Erosion

Thunder and
Lightning

Biologically
related
disasters

Epidemics

Pest Attacks

Cattle epidemics

Food poisoning

Chemical
disasters

Industrial related

Nuclear related

Accident
related
disasters

Forest Fires

Urban Fires

Mines Flooding
Oil Spill

Major Building
Collapse

Serial Bomb
Blasts

Festival related

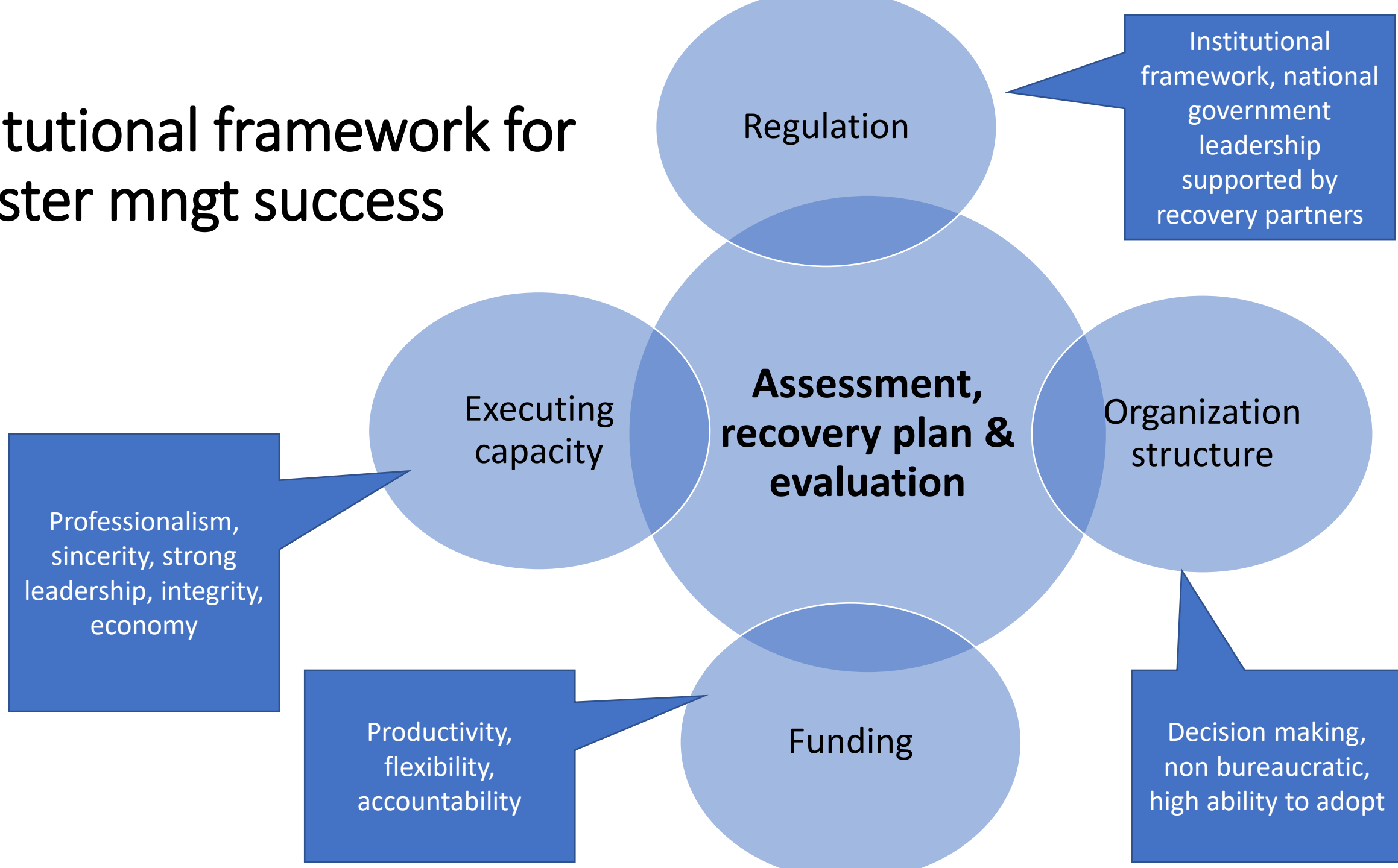
Electrical
disasters and Fires

Air, Road and Rail
accidents

Boat Capsizing

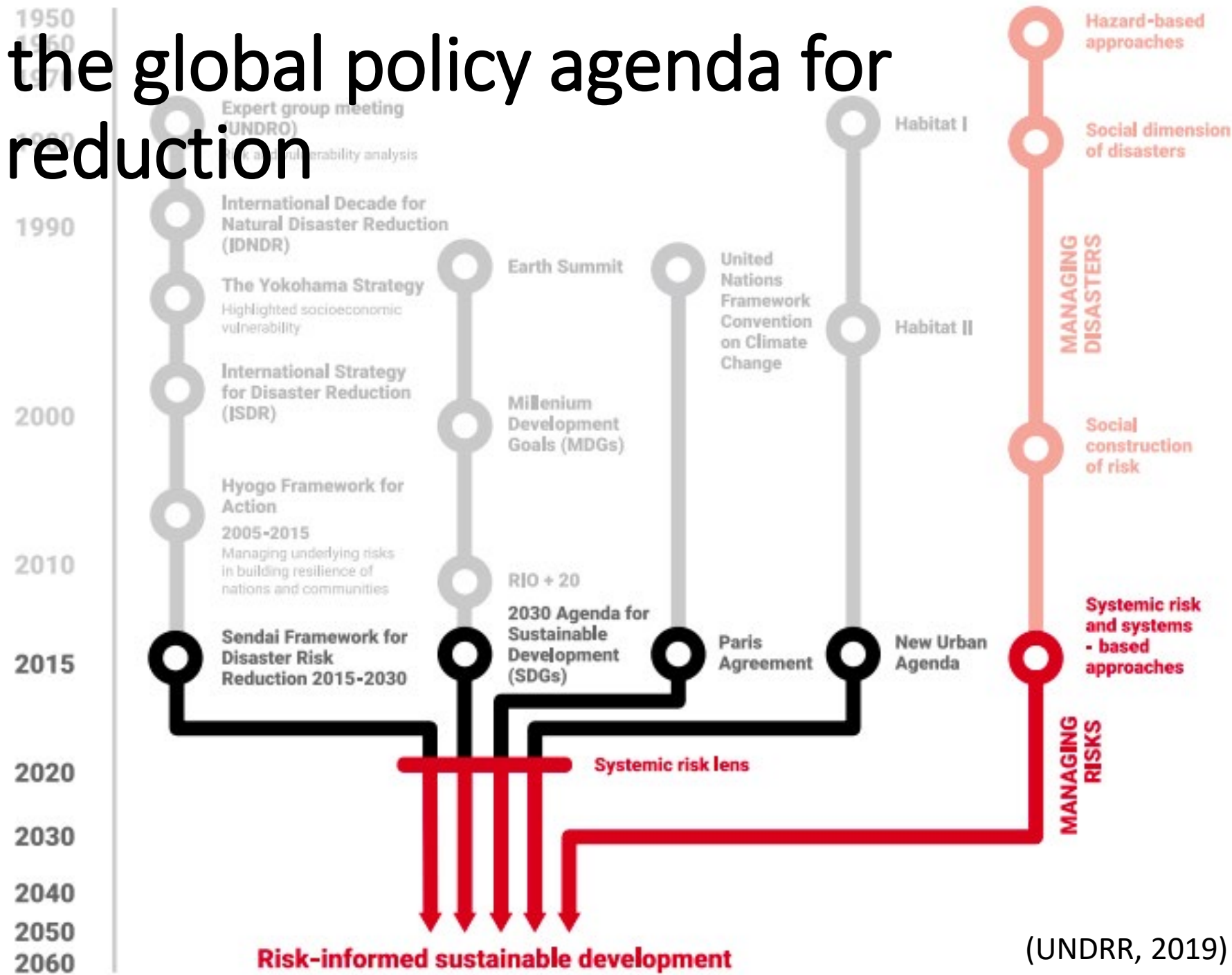
Village Fires

Institutional framework for disaster mngt success



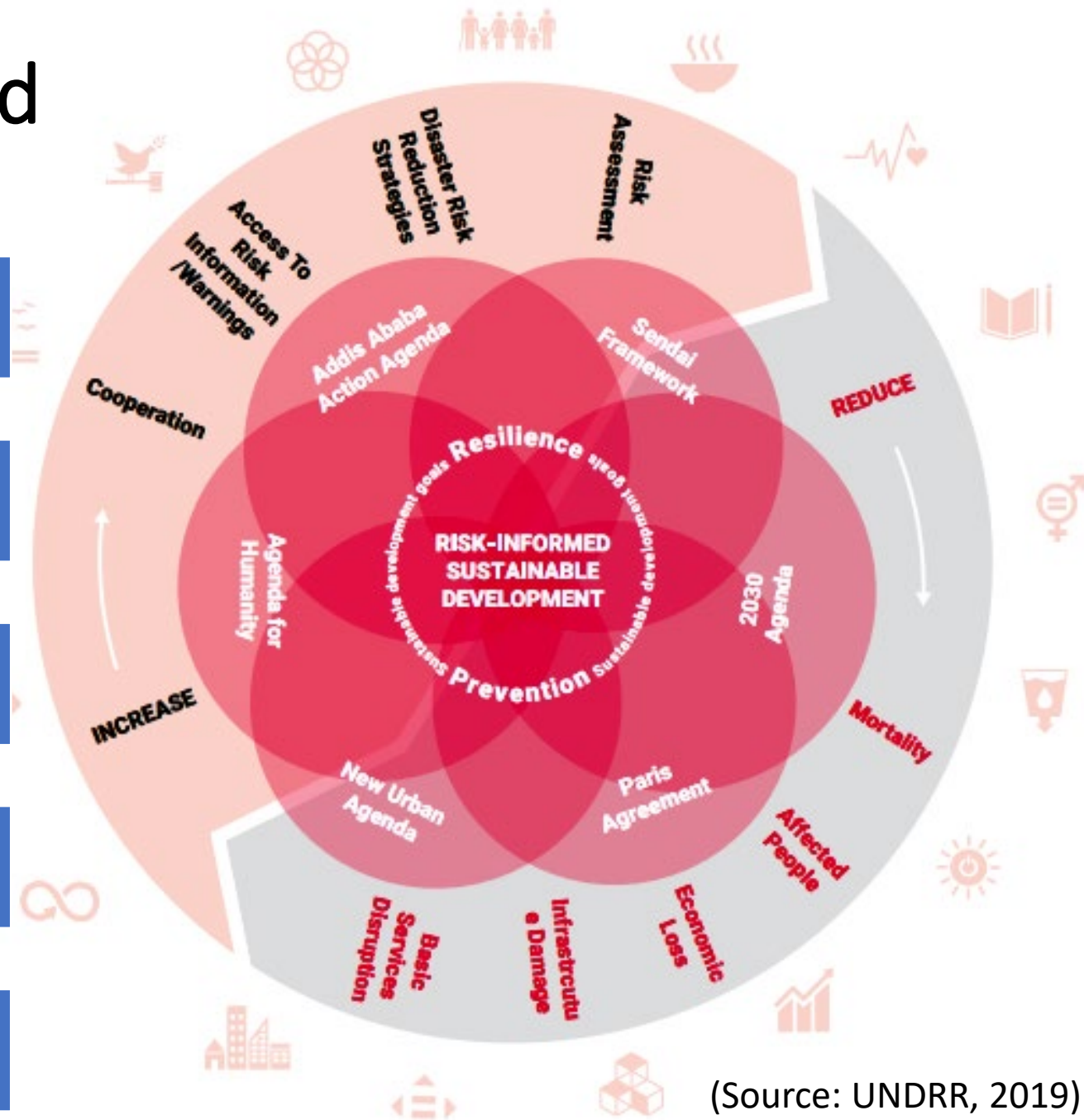
Evolution of the global policy agenda for disaster risk reduction

- Sendai Framework



			<i>Hazard</i>	<i>Exposure</i>	<i>Vulnerability</i>	<i>Scale</i>	<i>Systems</i>
Graf 2020+	Sendai Framework 2015	Hyogo Framework 2005	<ul style="list-style-type: none"> • Earthquake • Tsunami • Riverine Flood • Cyclonic Wind • Storm Surge 	<ul style="list-style-type: none"> • Structural 	<ul style="list-style-type: none"> • Economic 	<ul style="list-style-type: none"> • Global • National 	
			<ul style="list-style-type: none"> • Volcano • Fire • Biological • Technological 	<ul style="list-style-type: none"> • Agriculture • Basic Services 	<ul style="list-style-type: none"> • Social • Environmental 	<ul style="list-style-type: none"> • Local 	<ul style="list-style-type: none"> • Human • Ecological • Economic
			<ul style="list-style-type: none"> • Drought • Chemical • Industrial • Natech • Nuclear • Radiological 	<ul style="list-style-type: none"> • Housing • Critical Sys • Subsystems • Natural Capital 	<ul style="list-style-type: none"> • Governance • Legal • Security 	<ul style="list-style-type: none"> • Regional • Sub-nat • Metropol 	<ul style="list-style-type: none"> • Political • Cultural • Financial

Sendai Framework & the pursuit of risk informed sustainable development



(Source: UNDRR, 2019)

DM & (mega)projects

PRE-DISASTER:
Normal development



DISASTER:
Victims
Damage & loss
survivors



POST-DISASTER:
Emergency/Relief
Recovery
development

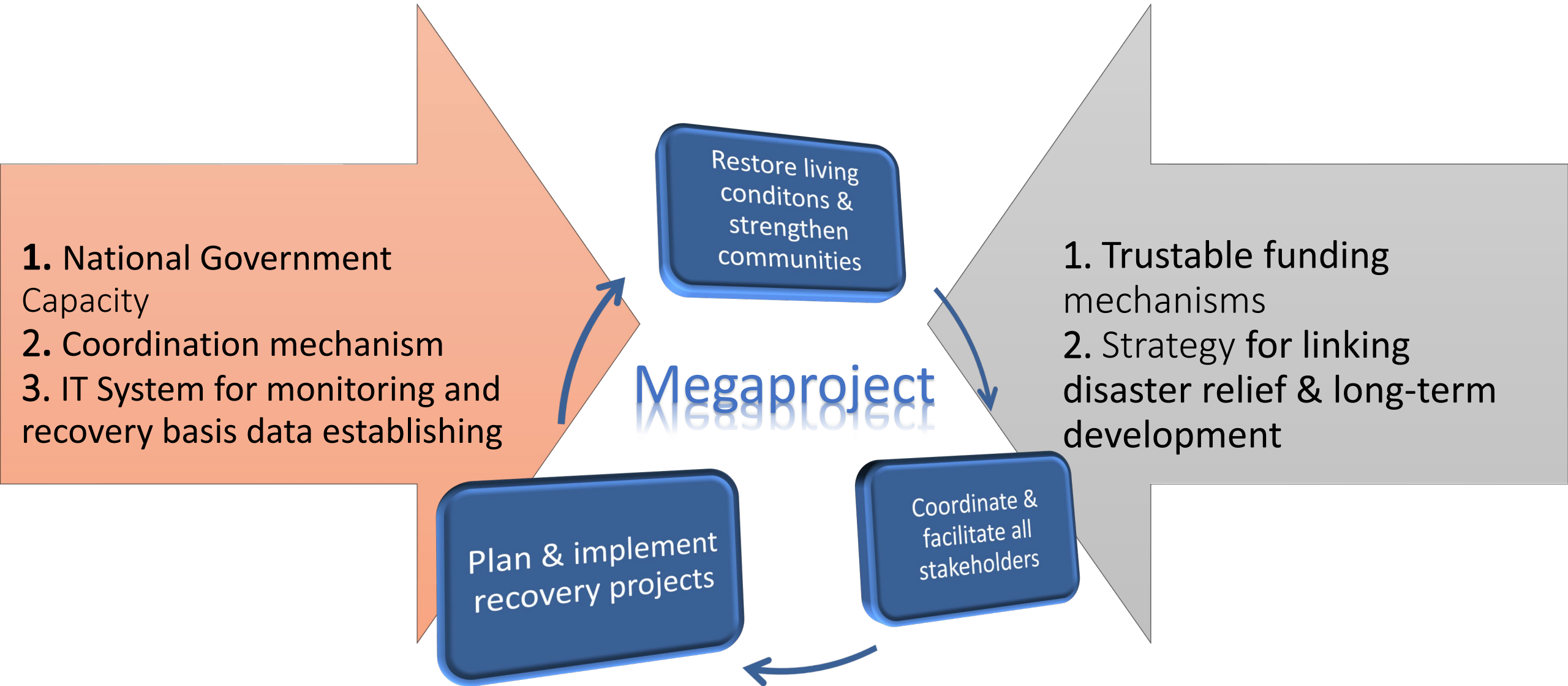
Strategic goals:

- The integration of disaster risk into development planning
- The development and strengthening of institutions, mechanisms and capacities for building resilience
- The incorporation of risk reduction approaches into emergency preparedness, response and recovery programmes

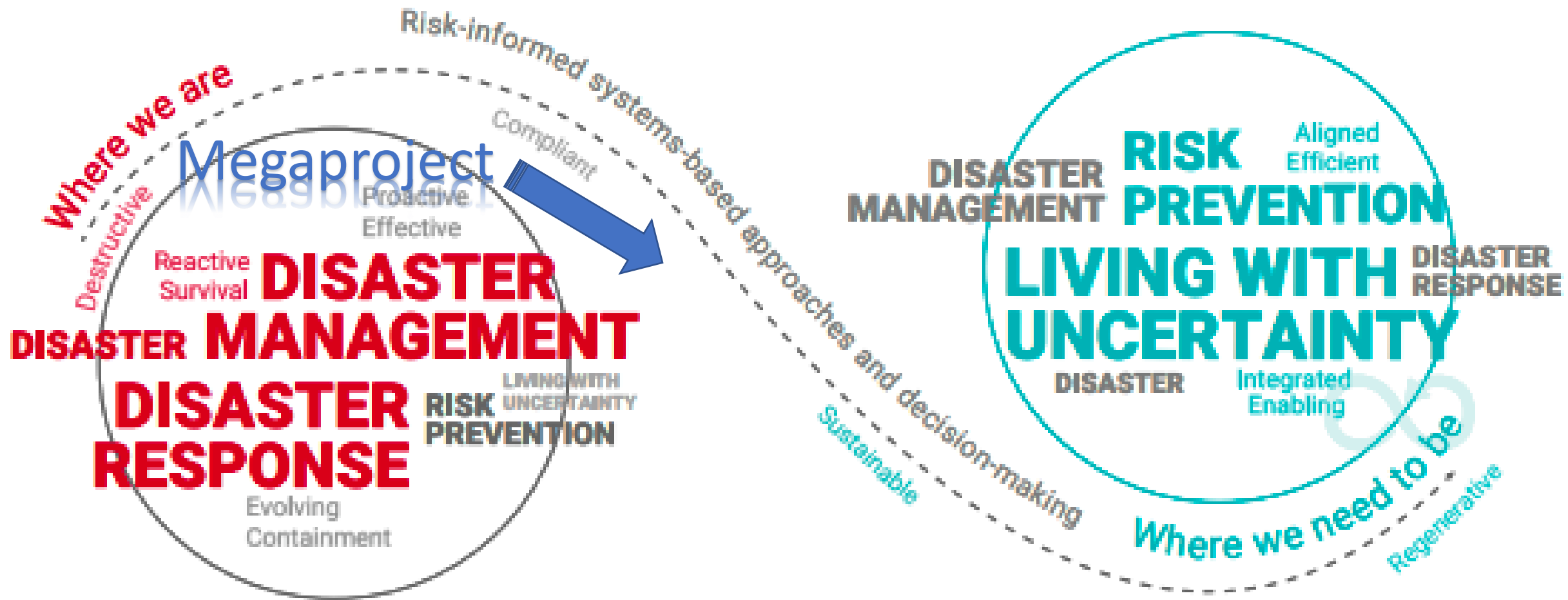
Priorities for Action:

- Ensure that DRR is a national and a local priority with a strong institutional basis for implementation
- Identify, assess and monitor disaster risks and enhance early warning
- Use knowledge, innovation and education to build a culture of safety and resilience at all levels
- Reduce the underlying risk factors
- Strengthen disaster preparedness for effective response at all levels

Recovery framework – in general



Innovation curve & megaprojects



(Source: UNDRR 2019) (Megaproject is added)

Recommendations

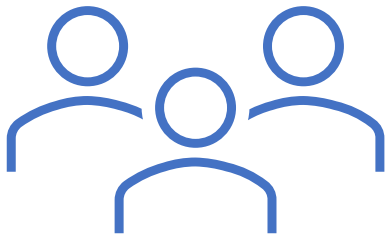


DRM laws

- Relationship btw DRR & DRM legal frameworks
- Institutional frameworks for decentralized implementation in DRM law
- DRR financing in DRM laws
- Civil society, stakeholders communities & public participation
- Vulnerable groups inclusion

Reinforcing DRR in Building, planning and environmental laws

- In building codes & land use regulations
- In legal provisions for informal settlements
- In legal provisions on environmental mngt & impact assessments
- In climate change adaptation laws
- In natural resource management laws



Cross-cutting areas of law in support of DRR

- Constitutional & human rights
- Legal accountability, responsibility and liability
- Legal frameworks for disaster insurance & other risk-sharing mechanisms
- Customary law and DRR

Table 1: Indicative burden on the public purse from recent events

Country	Year	Disaster	Damage and Loss				Estimated Recovery & Reconstruction Requirements
			Damage (US\$m)	Loss (US\$m)	Total (US\$m)	Public share of Total (%)	Total (US\$m)
Seychelles	2013	Flood	5.2	3.1	8.3	70	30.3
Fiji	2012	Cyclone	67.2	41.2	108.4	17	67.0
Samoa	2012	Cyclone	103.3	100.6	203.9	55	206.0
Malawi	2012	Flood	1.4	1.5	2.9		7.3
Bhutan	2011	Earthquake			24.5		22.63
Pakistan	2011	Flood	3,208.0	522.0	3,730.0		2,747
Japan	2011	Earthquake		210,200			
Thailand	2011	Flood	2,046	2,604.0	4,650.0	10	50,000
Djibouti	2011	Drought	51.7	157.3	209	67	318
Kenya	2011	Drought	805.6	11,300	12,105.6		1,770
New Zealand	2010-2011	Earthquake		15,950		15 ⁸	

Source: Government of Seychelles, 2013; Government of Fiji ,2012; Government of Samoa, 2012; Government of Malawi, 2012; Royal Government of Bhutan, 2011; Government of Pakistan, 2011; Government of Japan, 2012; Government of Thailand, 2011; Government of Djibouti, 2011; Government of Kenya, 2011; and New Zealand Treasury, 2011.

Building Resilient Society for Earthquake ~ Role of each stakeholders ~



Dislocated
offices in
Glina,
Petrinja &
Sisak

POTRESINFO

SLUŽBENA STRANICA ZA

VODIČ ZA PODNOŠENJE
ZAHTJEVA ZA OBNOVU

OBNOVA
BANOVINE

Info center
in Zagreb

Mobile
offices for
informing
and
receiving
requests

Izmjenama Programa mjera
dodatno će se pojednostaviti
procedure u obnovi i smanjiti
potrebna dokumentacija

Danas je održana treća po redu sjednica Stručnog
savjeta za obnovu, na kojoj se raspravljalo o jednom
od prvih idućih koraka u pripremi organizirane
obnove, a to su izmjene Prvog programa mjera, kao
provedbenog i podzakonskog akta kojim se određuju

Regulation Framework

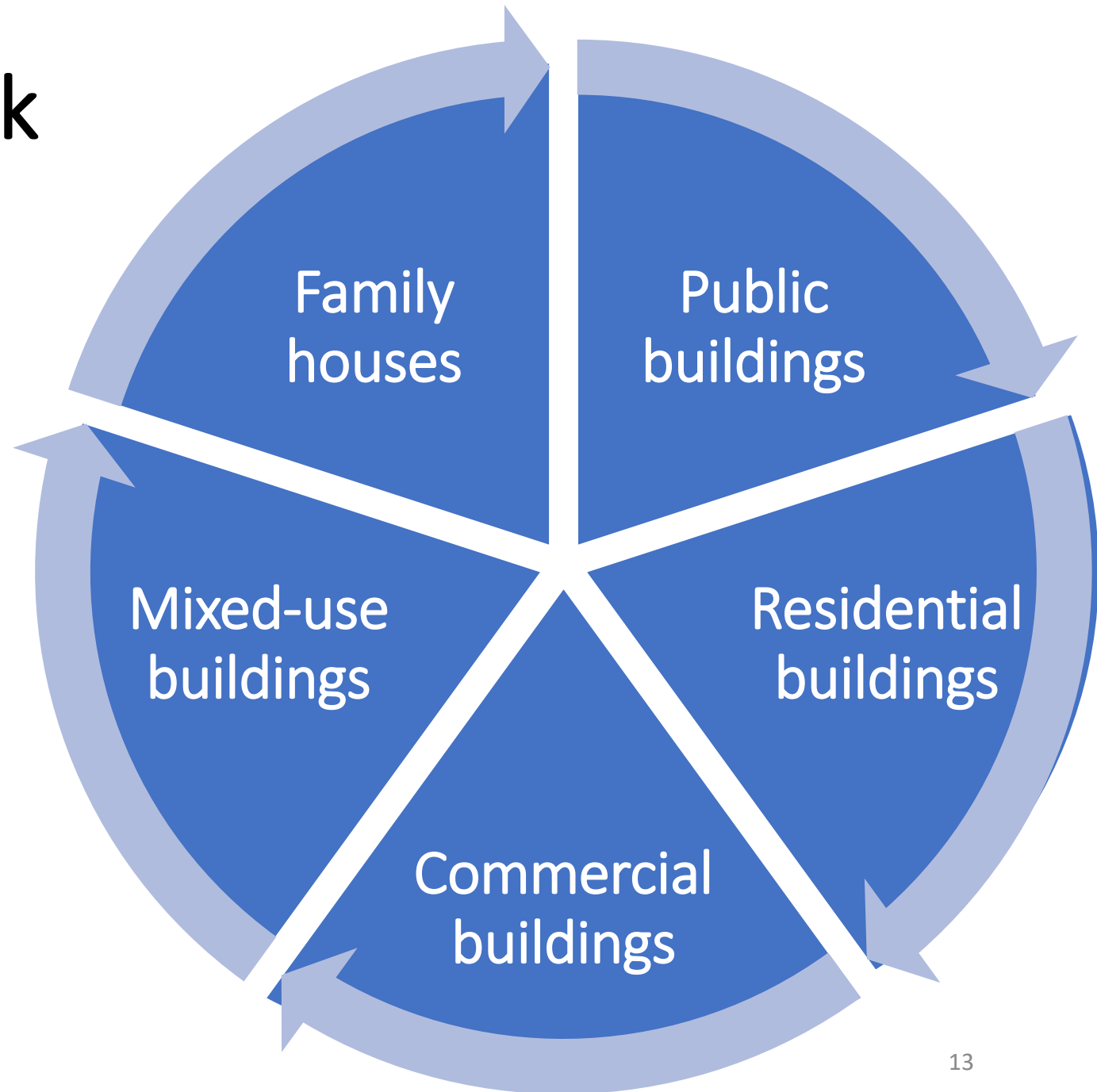
Recovery goals

Primary goal

Ensure mechanical resistance and stability in order to protect human health and life; prevent further damage

Secondary goal

Urban renewal & urban/rural regeneration



Green label

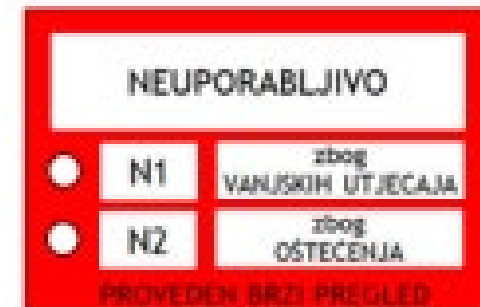
- ✓ **U1**, no right to a refund
- ✓ **U2**, right: **reimbursement of funds for emergency repairs**

Yellow label

- ✓ right to **refund of emergency** rehabilitation works funds
- ✓ right to **co-financing the construction** part of the reconstruction
- ✓ return of funds spent for the **project doc**

Red label

- ✓ right to a **refund of emergency rehabilitation** works funds
- ✓ right to **structural renewal**
- ✓ right to **removal funds**
- ✓ **construction of a demolished family home**



Regulation & system adoption

Building Act for Post-earthquake recovery

Ordinance for construction - adoption


Program of measures (bylaw)

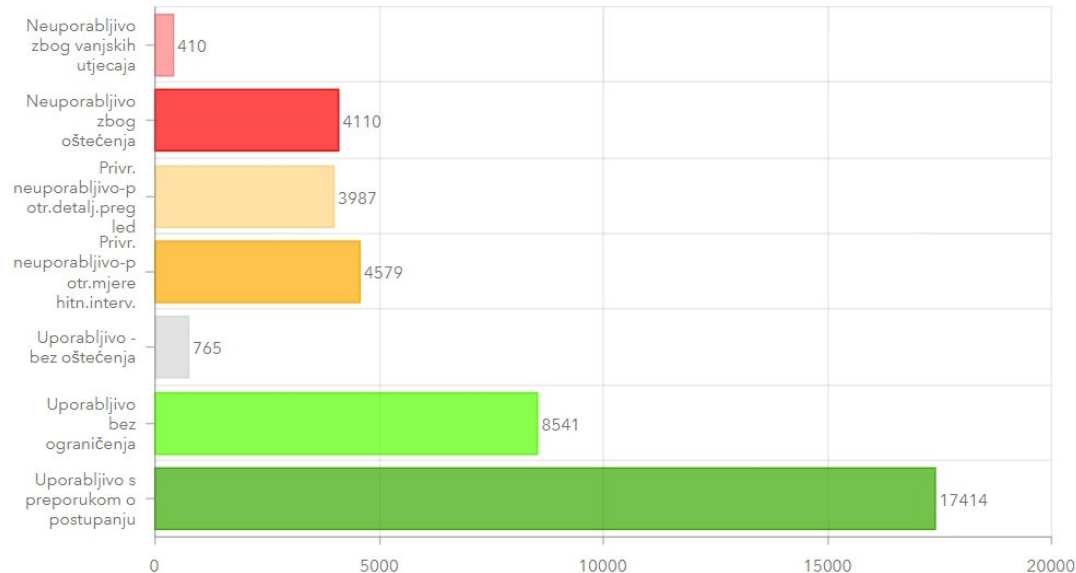
Technical document policy (bylaw)

Forms

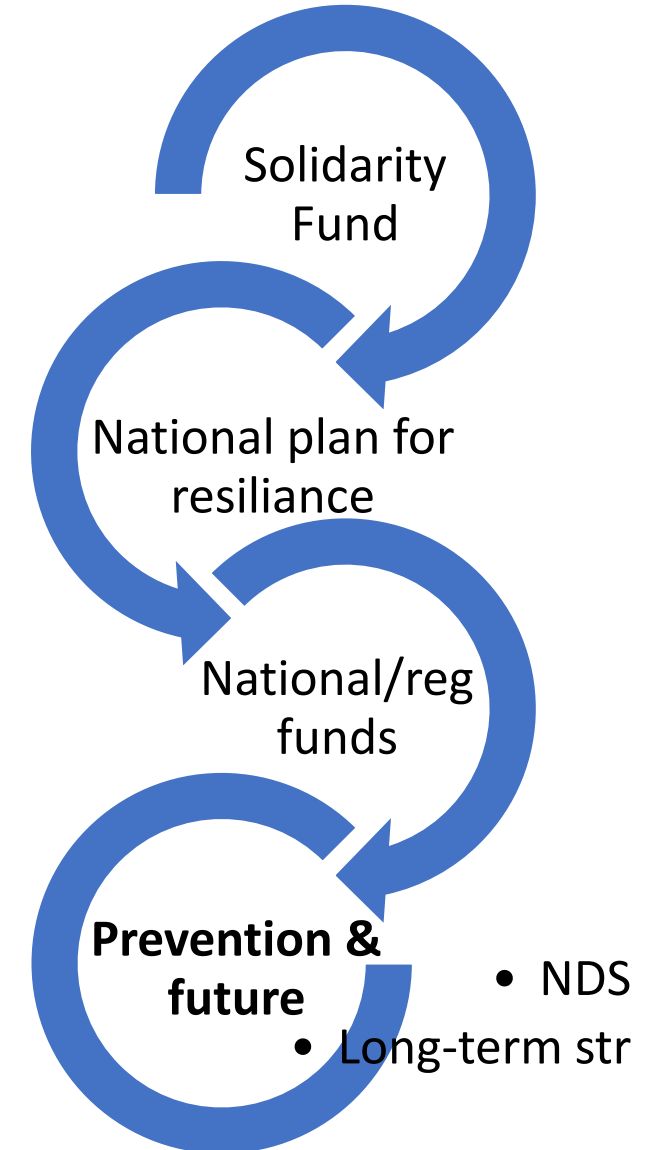
eRenovation

Broj prijava:
 **49513**

Broj pregledanih zgrada:
 **39806**



Last update: a few seconds ago



HRVATSKI CENTAR ZA POTRESNO INŽENJERSTVO
Stranica namjena potresna građevinskih stručnjaka za procjenu oštećenja nakon potresa u Zagrebu 2020 (NUE, Institucija)

Home O nama Potres u Zagrebu 2020 Upite za gradane Priručnici/Kolijevke... UPPD (interaktivni priručnik)
Webinari/Savjetovanja/Predavanja... Obavijesti iz Institucije Info seizmologije Platforma obnovi Zag Mediji
Preplata na obavijesti OroCEE Savjetovanje inženjera

Log in

Potres kod Petrinje:

SEARCH

KRATKA ANKETA:

Dragi svi posjetitelji HCPI stranice, lijepo vas molimo da sudjelujete u istraživanju ispunjavanjem kratkog upitnika čiji je cilj utvrđivanje glavnih izvora informiranja stanovnika Republike Hrvatske o potresima.

ANKETA

Toplinska ka

Analize PI SMZ

Log out

Istraživanje provode autorice s nekoliko znanstvenih institucija (Hrvatski geološki institut, Seizmološka služba pri Geofizičkom odjelu PMF-a, Geološki odsek PMF-a, Institut za turizam, Građevinski fakultet, Zagreb). Podaci prikupljeni ovim upitnikom će se koristiti isključivo u istraživačke svrhe. Sudjelovanje u

Technical Ordinance for construction: adaptation for mass application

Level 1

all buildings

Level 2

multi-apartment, residential and commercial buildings; public buildings with medium consequences that were slightly damaged in the earthquake

Level 3

buildings of „3” class of importance - buildings whose seismic resistance is important regarding the consequences related to demolition (pharmacies, schools, kindergartens, colleges, plants & equipment for supply, telecom, etc.)

Level 4

buildings of „4” class of importance - buildings whose integrity during the earthquake is of importance to the wider community (health facilities of greater importance, interview services, public administration buildings of vital importance for supply, telecom, energy buildings, buildings for storage of flammable liquids, gas and toxic materials)

Regulated authorities for the implementation of reconstruction

Ministry of Physical
Planning,
Construction and
State Assets

Fund for recovery
(formed after
earthquake)

Affected Counties

Central State Office
of Housing

Expert advisors'
group for post-
earthquake
recovery

Certified architects,
certified civil,
mechanical and
electrical engineers

Supervisors

Contractors

Operational
coordinators

Technical-financial
control

Ukupni broj prijava:

69297

Broj važećih prijava:

49513

Broj pregleda:

39805

Nepregledano:

9708

Nepregledano s prebivalištem:

4062

Nepregledano prvi pregled:

6764

Nepregledano prvi pregled s prebivalištem:

1803

Sisačko-moslavačka županija

Ukupni broj prijava:

69297

Broj važećih prijava:

49513

Broj pregleda:

39805

Nepregledano:

9708

Nepregledano s prebivalištem:

2891

Nepregledano prvi pregled:

2083

Nepregledano prvi pregled s prebivalištem:

661

Zagrebačka županija

Ukupni broj prijava:

69297

Broj važećih prijava:

49513

Broj pregleda:

39805

Nepregledano:

9708

Nepregledano s prebivalištem:

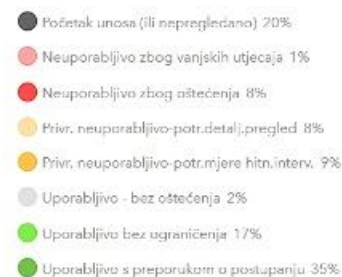
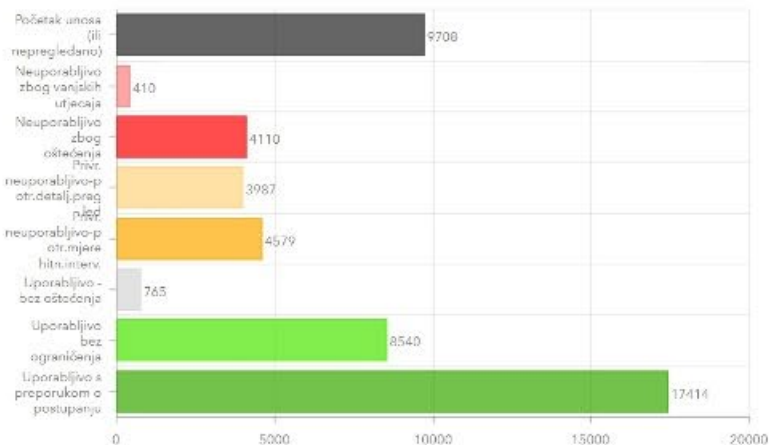
1095

Nepregledano prvi pregled:

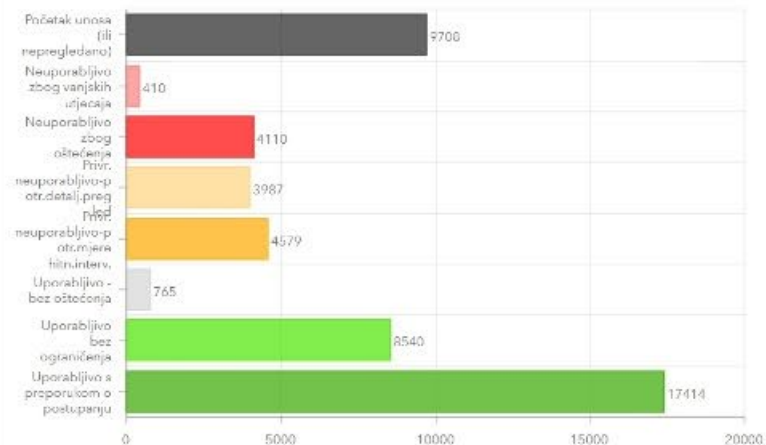
1444

Nepregledano prvi pregled s prebivalištem:

1080



Last update: a few seconds ago



Last update: a few seconds ago

Karlovačka županija

Ukupni broj prijava:

69297

Broj pregleda:

39805

Nepregledano:

9708

Nepregledano s prebivalištem:

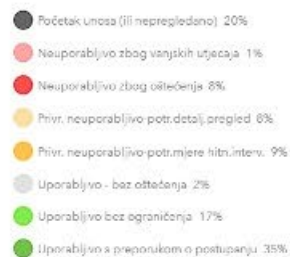
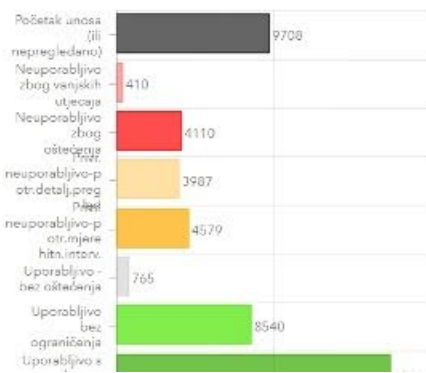
76

Nepregledano prvi pregled:

88

Nepregledano prvi pregled s prebivalištem:

62



Krapinsko-zagorska županija

Ukupni broj prijava:

69297

Broj važećih prijava:

49513

Broj pregleda:

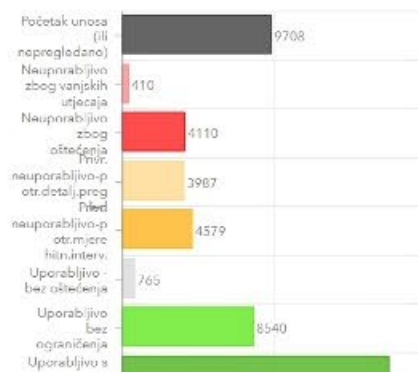
39805

Nepregledano:

9708

Nepregledano prvi pregled:

296



Grad Zagreb

Ukupni broj prijava:

69297

Broj važećih prijava:

49513

Broj pregleda:

39805

Nepregledano:

9708

Nepregledano prvi pregled:

2853



Time framework

- ✓ **30/06/2021**
 - finan.assist for project doc refund
- ✓ **31/12/2021**
 - finan.assist for temporary protection
 - for removing damaged building
- ✓ **31/12/2025**
 - for removing damaged family house
 - for building demolished family house
 - for replacement family home refund
- ✓ **31/12/2027**
 - for struct.ren or financ.assist for it
- ✓ **31/12/2030**
 - For comprehensive ren

Croatia

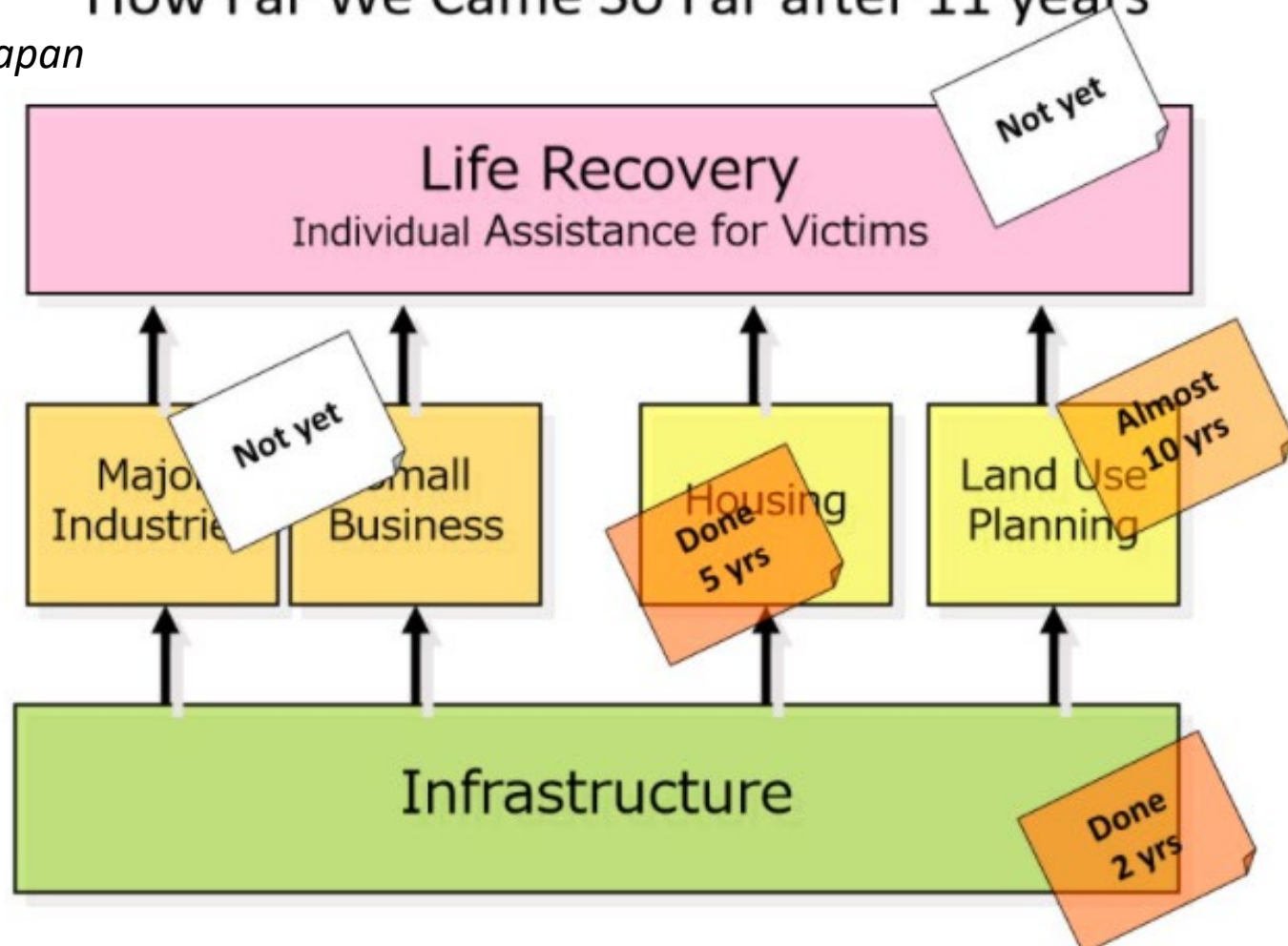
Japan



防災科研

2021.03
© HARUO HAYASHI

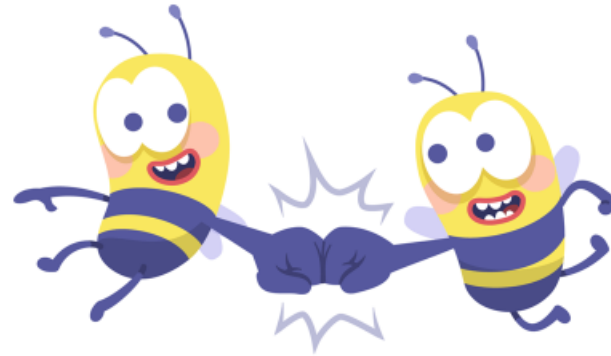
How Far We Came So Far after 11 years



Source: Webinar (Croatia-Japan, March 2021): Towards Disaster Resilient Croatia, Haruo Hayashi, Ph.D., National Research Institute for Earth Science and Disaster Resilience (NIED), Japan



THANK YOU FOR YOUR ATTENTION.



Doc. Dr. Sc Maja Marija Nahod, University of Zagreb, Faculty of Civil Engineering

E-mail : maja.marija.nahod@grad.unizg.hr

Prof. Dr. Sc. Mladen Radujković, Alma Mater Europaea, ECM

E-mail : mladen.radujkovic@almamater.si



ALMA MATER
EUROPAEA
ECM