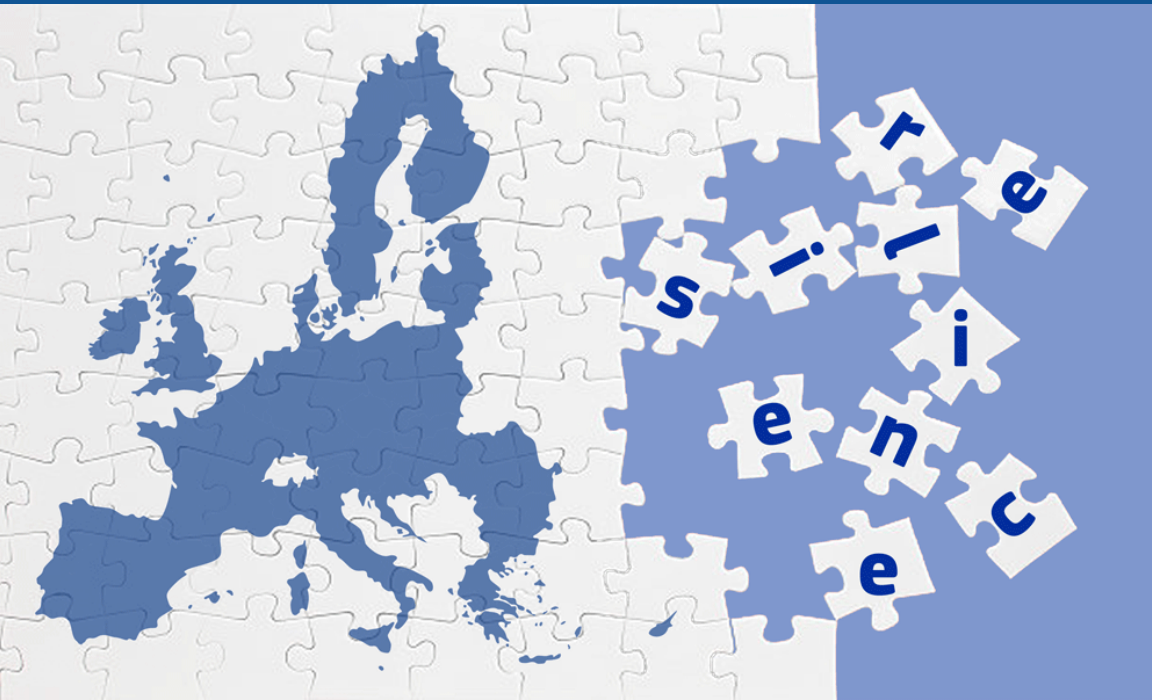


Resilience at JRC



Naouma Kourti

Dep. Head of Unit

Technology Innovation in security

Security, Space and Migration Directorate

The Joint Research Centre at a glance

3000 staff

Almost 75% are scientists and researchers.

Headquarters in Brussels and research facilities located in

5 Member States.



The science and knowledge service of the Commission

- Evidence-based scientific and technical support on policy relevant areas.
- In support of other Commission services, EU Institutions and Member States.
- Independent of industrial and national interests (available and tailor made).

...to support EU policies with independent evidence throughout the whole policy cycle.





Many Definitions of Resilience

“the ability of a system, community or society exposed to hazards to resist, absorb, accommodate to and recover from the effects of a hazard in a timely and efficient manner, including through the preservation and restoration of its essential basic structures and functions. The resilience of a community in respect to potential hazard events is determined by the degree to which the community has the necessary resources and is capable of organizing itself both prior to and during times of need.” **UNISDR**

“Resilience is the combination of civil preparedness and military capacity – a society’s ability to resist and recover easily and quickly from these shocks through a combination of civilian, economic, commercial and military factors”. **NATO**

The ability to adapt to changing conditions and withstand and rapidly recover from disruption due to emergencies. Whether it is resilience towards acts of terrorism, cyber-attacks, pandemics, and catastrophic natural disasters, our national preparedness is the shared responsibility of all levels of government, the private and non-profit sectors, and individual citizens” **DHS USA**

Types of Resilience

TABLE 1: TYPES OF RESILIENCE

Resilience type according to subject	Resilience type according to adversity
Individual Resilience	Disaster Resilience
Ecological Resilience	Earthquake Resilience
Community Resilience	CBRN Resilience
Critical Infrastructure Resilience	Conflict Resilience
Financial Resilience	Cyber-threat Resilience
Organisational Resilience	etc.
etc.	

Resilience elements

Subject

- Individual
- Community
- Organisation
- Critical Infrastructure
- City etc.

} Or any combination

Adversity

- Spatial
- Temporal
- Origin
- One or Multiple events
- Intensity

Positive outcome

- Absorb
- Adapt
- Transform

} Or any combination

Challenges of resilience

Individual & Collective Behavior

Subject

- Interdependencies

Adversity

- Cascading Effects

Positive
Outcome

- Lessons learnt from others



Union Policies on Resilience

Resilient Energy Union

Cyber Resilience

Security Union

External Policies

Resilience of EU's Financial Institutions

Environmental Policies

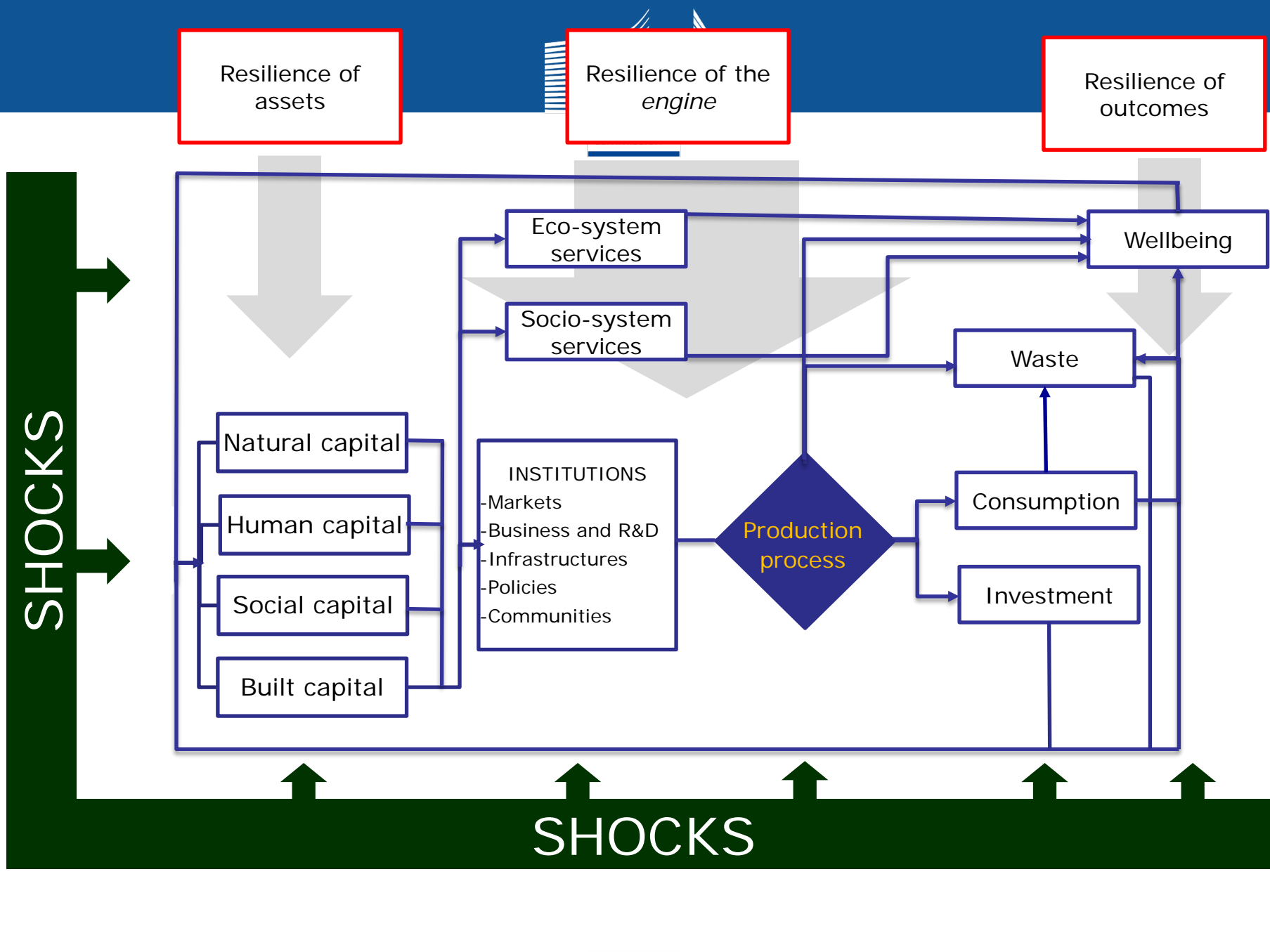
Space Policy

Resilience in our Directorate





RESILIENCE OF EUROPEAN SOCIETY



Step 3

To **assess** the impact of a certain type of shock
(colour coding)

- Which system variables are relevant for a given shock?
- Which ingredient of the system and which system variables would it affect directly ?
- After the direct hit, which additional ingredients and (groups of) system variables would be affected ?

Resilience ingredient		Impact by type of shock																
		Financial			Social					Environmental				Digitalisation	Terroristic attack	Economic	Health	Energy
		currency crisis	systemic banking	...	Migration	Violence	Ageing	Poverty	Job loss	Earthquake	Flood	Drought	Storm surge					
Assets	Natural capital									primary impact								
	Human capital									primary impact								
	Social capital									transmission channel								
	Built capital									primary impact								
Engine	Eco system services									primary impact								
	Socio system services									transmission channel								
	Markets																	
	Infrastructures									primary impact								
	Business & Research																	
	Policies																	
	Communities																	
Final outcome	Wellbeing									transmission channel								
	Waste																	
	Consumption																	
	Investment																	

primary impact
transmission channel

Step 4

Develop **indicators of resilience**

Resilience indicators can be estimated as the **dynamic response** of **system variables** to **disturbances** by groups, city, region or country level.

Possible estimation approaches:

- **Event study approach**
- **Model-based approach**

STEP 5

Determine **characteristics (drivers/determinants) of resilience**

The **dashboard** will display resilience characteristics for various entities (individual, cities, regions,...)

	Technological change			...		
Level of entity	Characteristic 1	Characteristic 2	...	Characteristic 1	Characteristic 2	...
Individual	Level of education	Strength of local social ties	...			
Community	Average level of education	...				
City	Average level of education	Types of schools	...			
NUTS3 region (provincia)				
NUTS2 region (regione)	...					
NUTS1	...					
Country	...					



Objectives of project on Resilience

- **Develop indicators to monitor resilience** of the EU in various fields
- Promote the analysis of **resilience in the policy making process**, assessing the impact of existing and new policies on stimulating resilience
- Do this by **arranging and steering** related JRC activities using the **common Resilience framework**
 - Involving also **partner DGs**, EU and international **institutions** and **academic** liaisons



2017 Workplan

System matrix and colour coding -

B1 + all JRC units team with policy DGs

Mapping of JRC models into the system matrix -
Competence Centre on Modelling

A test case (proof of concept) of the dashboard - B1
and B3

**Workshop - Modelling of Physical, Economic and Social
Systems for Resilience Assessment** (Brussels, end 2017)

E2 + E1, E4, E7, B1, and D6



2018 Workplan

- Goal: use and implement the **conceptual framework**
 - Focus on the **EU** and the **societal dimension**
 - **Value existing JRC competences**
 - Work **with partner DGs** and involve external partners (e.g. academia)
- ***Concentrate on 2 shocks***
Migration & Digitalization



RESILIENCE

The Joint Research Center organises the 2nd International workshop
on
Modelling of Physical, Economic and Social Systems
for Resilience Assessment

14-16 December 2017
Brussels

In collaboration with



Stay in touch



EU Science Hub: ec.europa.eu/jrc



Twitter: [@EU_ScienceHub](https://twitter.com/EU_ScienceHub)



Facebook: [EU Science Hub - Joint Research Centre](https://www.facebook.com/EU_Science_Hub_-_Joint_Research_Centre)



LinkedIn: [Joint Research Centre](https://www.linkedin.com/company/joint-research-centre)



YouTube: [EU Science Hub](https://www.youtube.com/EU_Science_Hub)