



Upload form OER – [Urban Resilience](#)

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Title:

Author:

Date:

The form below is meant for the publication of your resource(s) on [Edusources](#). If you are providing multiple resources, please fill in a separate form for each resource. If your resource has multiple parts (files), include them here.

Item	
Summary (short description of your resource(s)).	
Learning Objectives	
Include study guide (if applicable)	
Link to your research or any other publications (if you like of if need be)	
Intended user (meaning student and/or teacher and/or general public)	
Target group (for example: this material is for students pursuing a master's degree in the field of environmental engineering)"	
Key words (select at least one keyword from the Keywords list below)	
If applicable: sequence of resource part (learning path, start with..... then...	
Best use in education (for example: preparation, understanding basic concepts, in-depth knowledge, assignment, etc.).	
Main collection to which the resources belong (select from Collections descriptions, see appendix)	
Preferred CC-license (default BY-NC-SA)	
Any concerns about copyright that we should look at or deal with?	
Your E-mail address: visible (yes/no)	
Any other remarks	



Keywords List

Risk management	Serious games
Asset management and maintenance	Big data/AI
Governance and planning	System Dynamics
Civil Engineering	Decision making/Optimisation
Ecology	Scenario-based design- What if?
Sustainability	Agent-based modelling
Robustness	Multiscale modelling
Uncertainty	Heuristics (Probabilistic)
Shocks	Information technology?
Stresses	Engineering methods
Recovery	Geospatial (GIS)
Reliability	Social science methods?
Redundancy	Complex networks analysis
Disaster mitigation/prevention	(Social) network analysis
Vulnerabilities	Key performance indicators
Complexity theory	Vulnerability indicators
Adaptation	Baseline
Uncertainty	Impact
Agents	Temporal
Emergence	Spatial resolution
Self-organization	Early warning for prediction
Temporality	Data
Feedback loops	Cyber-security
Cascading effects	System thinking
Lever points	Machine learning/AI
STE systems	Pattern recognition
Risk and uncertainty	Netcentric governance
Conceptual modelling	Coordination



Collaborative/communicative planning

Participatory design

Vertical/horizontal integration

Challenges in governance, e.g. wickedness

Institutions & roles

Stakeholder analysis

Cost-benefit analysis

Key performance indicators

Vulnerability indicators

Normativity & values

Social Resilience

Social Resilience Indicators

Social Justice

Distributive Justice

Intergenerational Justice

Cost-Benefits approaches

Utilitarian approaches

Rights-based approaches

Socio-economic vulnerabilities



Appendix: Urban Resilience Platform Collections

The 8 collections on the Urban Resilience Platform are:

1. Resilience Engineering Core Concepts
2. Design Principles for Critical Services and Infrastructures
3. Measuring and Analyzing Resilience of STE Systems
4. Governance and Institutional Arrangements of Complex STE Systems
5. Ethics of Resilience
6. Dutch and International Case Studies
7. Urban Resilience Games
8. Full-Length Courses

COLLECTION 1: RESILIENCE ENGINEERING CORE CONCEPTS

This collection houses materials containing core concepts of resilience engineering to provide a foundation for all engineering disciplines in resilience thinking and its principles. Materials in this collection introduce a range of definitions of resilience and concepts of resilience like robustness, shocks, stresses and uncertainty and STE systems and their main attributes. Many of these concepts originate from complexity theory and disaster management.

- Conceptual Difference between Risk, Resilience, and Robustness
- Animation: Why Infrastructures are Complex Systems
- Climate Change and the Development of Resilience Societies

COLLECTION 2: DESIGN PRINCIPLES FOR CRITICAL SERVICES AND INFRASTRUCTURES

The design and engineering of critical infrastructure systems that are relevant to urbanizing deltas – transport, water, energy, cyber& ICT, agriculture and urban planning – must consider the impact of long-term stresses and intensifying shocks from a range of disastrous events. Materials in this collection familiarize students with various shocks and stresses on urban subsystems and their components as well as resilience measures and strategies. Notable materials include:

- Flood Resilience and Defense
- Extreme Value Analysis
- Climate-responsive Planning and Design (CRPD) course: Assignments

COLLECTION 3: MEASURING AND ANALYZING RESILIENCE OF STE SYSTEMS

Quantifying the resilience of systems vis-a-vis adverse trends and shocks ranging from climate change to extreme weather events is a particular challenge. This collection focuses on the role of technological innovation and smart cities and the application of different methods for measuring and modelling resilience under uncertainty. Notable materials include:

- Quantifying the Performance of Resilience Increasing Measures
- Vulnerability Assessment
- Robustness of Infrastructures
- Agent-Based Modeling for Resilience

COLLECTION 4: GOVERNANCE AND INSTITUTIONAL ARRANGEMENTS OF COMPLEX STE SYSTEMS

This collection contains materials that help students assess vulnerable groups and involve stakeholders in the governance of critical infrastructures, including resilience engineering policy measures to reduce and absorb shocks and stresses. Materials include tools and methods for analyzing complex governance arrangements for facilitating meaningful engagement in a multi-actor context and coordinating policy-making. Notable materials include:

- Uncertainty and Decision-making
- How to Achieve Effective Water Protection Policies
- Introduction to Actor Analysis in 6 Steps

COLLECTION 5: ETHICS OF RESILIENCE

Materials in this collection will stimulate students to integrate value-driven design and responsible innovation in their planning decision. This includes reflecting on trade-offs, robustness, reliability, and cost. Featured materials are:

- How to “Design for Values”
- 4As Framework
- Conceptual Framework for Energy Justice

COLLECTION 6: DUTCH AND INTERNATIONAL CASE STUDIES

Dutch and international city-specific case studies showcase core themes of how urbanizing deltas around the world are coping with extreme events. These case studies integrate important resilience trends and topics to show the practical implementation of resilience and its impacts on society. The cases synergize materials coming from multiple disciplines and other collections on the platform. Notable case studies include:

- Amsterdam: Integrated solutions and inclusive governance in a smart city
- Kampala: Co-creating water resilience through circular water management and stakeholder participation
- Japanese Cities: Critical infrastructure design for extreme resilience



COLLECTION 7: URBAN RESILIENCE GAMES

Urban resilience games that give students the opportunity to learn important lessons about the interdependencies among socio-technical and environmental systems. To safeguard the future of our cities, an understanding of the impact of measures taken to cope with shocks and stresses on these systems is needed, all in the context of real-world challenges. The games offer different perspectives of resilience and how they influence key performance indicators and decision making for better prevention and mitigation of shocks and stresses. Notable games include:

- Dissolving Disasters game by the Red Cross Red Crescent Societies
- RElastiCity: An Urban Resilience Game
- SURE! Simulation Urban Resilience Exercise by the British Red Cross EUROPEAID

COLLECTION 8: FULL-LENGTH COURSES

This collection contains full courses on a specific topic, with defined learning objectives, modules, lecture materials, and assignments included in a curriculum format. Featured courses are:

- Course on Robust Policies for Operational Management Problems
- Course on Agent Based Modeling
- Course on Climate-responsive Planning and Design