RESIN

SUPPORTING DECISION – MAKING FOR RESILIENT CITIES

RESIN Glossary

Work Package 1

Dissemination Level: PU

Lead Partner The University of Manchester

Due Date: 31 January 2016

Submission Date: 31 January 2016

Deliverable No.	Deliverable No. 1.2
Work Package	1
Dissemination Level	PU
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Date	30/01/2016
File Name	D1_2_Glossary_UNIMAN_2015-01-29
Status	PU
Revision	27/1/2016
Reviewed by (if applicable)	Peter Bosch (TNO)

This document has been prepared in the framework of the European project RESIN – Climate Resilient Cities and Infrastructures. This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement no. 653522.

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This project is funded by the Horizon 2020 Framework Programme of the European Union.

Executive Summary

The glossary in section 3 outlines the definitions for various terms that will be employed throughout the RESIN project in order to ensure that the terms are consistently used. This deliverable is strongly linked to the RESIN Conceptual Framework (Deliverable 1.3).

The definitions stem directly from RESIN's State of the Art reports (Deliverable 1.1) with some minor modifications to harmonize with the Intergovernmental Panel on Climate Change (IPCC) definitions outlined in their most recent assessment report (AR5) (IPCC 2014) and to add further relevant definitions.

This document is a living document, and other terms may be added as the RESIN project progresses.

1. Introduction

The glossary in Section 3 outlines the definitions for various terms that will be employed throughout the RESIN project. This deliverable is strongly linked to the RESIN Conceptual Framework (Deliverable 1.3; Fig. 1). The definitions stem directly from RESIN's six State of the Art reports (Deliverable 1.1) as follows:

- Urban Critical Infrastructure Systems (Rome et al., 2015)
- Adaptation, Resilience and Disaster Risk Reduction: Concepts, Definitions and Application (Nassopoulos et al., 2015)
- Weather and climate hazards facing European cities (Carter et al., 2015)
- Vulnerability Assessment: Definitions, Indicators and Existing Assessment Methods (Connelly et al., 2015)
- Adaptation Approaches: Characterizing, assessing and prioritizing towards implementation. (Abajo et al., 2015)
- Decision Support (Wijnmalen et al., 2015).

The RESIN project is adopting a risk-based approach, as suggested by the Intergovernmental Panel on Climate Change (IPCC). The IPCC have recently revised their approach to harmoize the work in disaster risk reduction with climate chage adaptation (IPCC 2012). This has particular implications for the concept of 'vulnerability' and the relationship of 'exposure' to other concepts (Nassopoulos et al 2015; Connelly et al 2015). Consequently, this means that there will be significant differences between the approach adopted by many earlier European projects which follow the IPCC's former definition of vulnerability.

As RESIN is seeking to connect different research traditions across disaster risk reduction, critical infrastructure protection and climate change adaptation, this document is a key resource to ensure that terminology and definitions remain consistent across all partners and work packages.

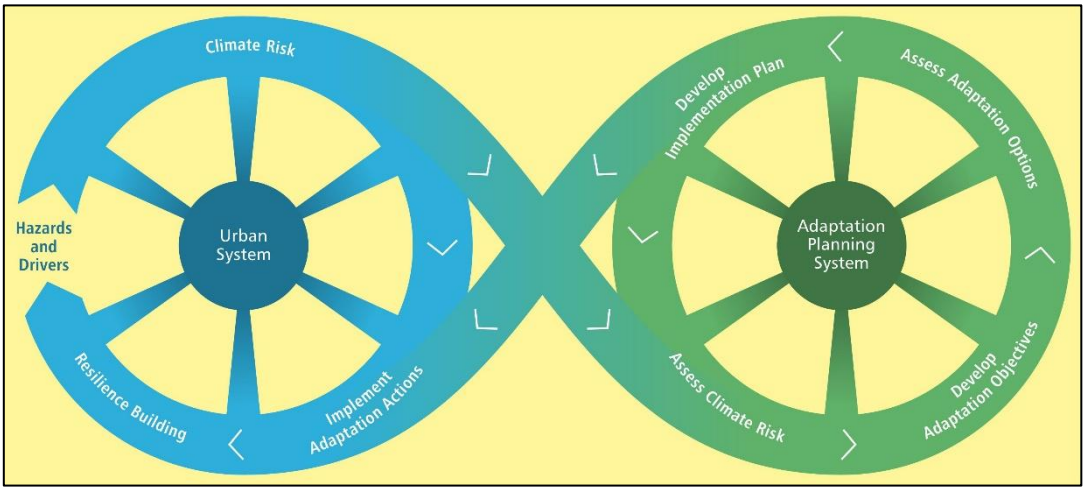

Fig. 1: The RESIN Conceptual Framework.

The glossary is a living document, and other terms may be added through the RESIN project depending on the outcomes of the various work packages.

2. Glossary Development

This section outlines the process of agreeing the definitions. In some cases, there are several definitions available. Following the experience of CIPedia© (2015), it was decided to document competing definitions, but to indicate the *preferred* definition for RESIN.

2.1. Background

The purpose of the glossary is to support the RESIN project by providing partners, from different disciplines, with easy access to the preferred definitions for terms used throughout the project. The glossary will also help partners to clearly communicate their work to audiences beyond RESIN.

2.2. Compilation Procedure

2.2.1. First step of procedures

The RESIN State of the Art reports provided guidance on the key definitions as part of Deliverable 1.1. These were combined and checked against one another for consistency and to identify potential divergences from the developing conceptual framework. The reports were also scanned to get a sense if any terms may be missing; however, none were found.

Climate change adaptation words were checked against the current version of the IPCC glossary (IPCC 2014). This meant some slight changes to the definitional terms associated with 'adaptation to climate change' to include 'autonomous', 'evolutionary', 'incremental', and 'transformative' adaptation. In addition, terms such as 'urban' are very hard to define and often depend on the data available. Therefore, an official EU/OECD definition for the term 'urban' was added.

2.2.2. Second step of procedures

RESIN partners were provided a draft of the glossary to comment on whether there were any terms missing or definitions that they felt uncomfortable with. The questions posed were:

- In some cases, some words have slightly different definitions depending on the discipline. CIPedia© has adopted the approach of gathering together all definitions.

  (a) Do you think that the same approach should be adopted for RESIN?

  (b) Could you please explain the major benefits or drawbacks, in terms of furthering your work, if this approach was adopted?

- Please read through the definitions. They have been identified through the State of the Art reviews or else selected to harmonise with the IPCC 2014.

  (a) Are there any definitions that you feel uncomfortable with? If so, please suggest an alternative definition.

  (b) Are there any words that are missing from your point of view?

As a consequence, terms that were missing from the SOTA report definitions, such as 'likelihood' and 'event', were added.

Term	Definition	Source
Adaptation (to climate change)	The process of adjustment to actual or expected climate, and its effects. See also Autonomous Adaptation, Evolutionary Adaptation, Incremental Adaptation and Transformative Adaptation	IPCC 2014
Adaptation Assessment	The practice of identifying options to adapt to climate change and evaluating them, in terms of criteria such as availability, (co-) benefits, costs, effectiveness, efficiency and feasibility.	Adapted from IPCC 2014
Adaptation Options	The array of strategies and measures that are available and appropriate for addressing adaptation needs. They include a wide range of actions that can be categorized as structural, institutional, or social.	IPCC 2014
Adaptation Pathway	See Climate Resilient Pathways	
Adaptation Strategies	[Adaptation Strategies] include a mix of policies and measures with the overarching objective of reducing vulnerability. Depending on the circumstances, the strategy can be set at a national level, addressing adaptation across sectors, regions and vulnerable populations, or it can be more limited, focusing on just one or two sectors or regions.	IPCC 2014
Adaptive capacity (or adaptability)	The ability of systems, institutions, humans, and other organisms to adjust to potential damage, to take advantage of opportunities, or to respond to consequences.	IPCC 2014
Autonomous Adaptation	Adaptation in response to experienced climate and its effects, without planning explicitly or consciously focused on addressing climate change. Also referred to as spontaneous adaptation.	IPCC 2014
Baseline	state against which change is measured	IPCC 2014
Blue Infrastructure	See Green Infrastructure	
Cascading Effects	A sequence of events in which each one produces the circumstances necessary for the initiation of the next. See also Consequence Analysis	Allaby 2004
	A sequence of events in which each individual event is the cause of the following event; all the events can be traced back to one and the same initial event.	Rome et al. 2015
Climate	Climate in a narrow sense is usually defined as the average weather, or more rigorously, as the statistical description in terms of the mean and variability of relevant quantities over a period of time ranging from months to thousands or millions of years. The classical period for averaging these variables is 30 years, as defined by the World Meteorological Organization.	IPCC 2013
Climate Change	Climate change refers to a change in the state of the climate that can be identified (e.g., by using statistical tests) by changes in the mean and/or the variability of its properties, and that persists for an extended period, typically decades or longer.	IPCC 2013
Climate Projection	A climate projection is the simulated response of the climate system to a scenario of future emission or concentration of greenhouse gases and aerosols, generally derived using climate models.	IPCC 2013

Climate Resilient Pathways	Iterative processes for managing change within complex systems in order to reduce disruptions and enhance opportunities associated with climate change.	IPCC 2013
	…an iterative and ongoing approach, informed by a strategic vision, that enables experimentation and learning so that choices along pathways can be altered in response to predefined triggers.	Wise et al. 2014
Climate Model	A numerical representation of the climate system based on the physical, chemical and biological properties of its components, their interactions and feedback processes, and accounting for some of its known properties.	IPCC 2013
Climate System	The climate system is the highly complex system consisting of five major components: the atmosphere, the hydrosphere, the cryosphere, the lithosphere and the biosphere, and the interactions between them.	IPCC 2013
Coastal Flooding	A coastal flood is when the coast is flooded by the sea. The cause of such a surge is a severe storm. The storm wind pushes the water up and creates high waves.	FLOODsite 2008
Co-benefits	The positive effects that a policy or measure aimed at one objective might have on other objectives, irrespective of the net effect on overall social welfare. Co-benefits are often subject to uncertainty and depend on local circumstances and implementation practices, among other factors. Co-benefits are also referred to as ancillary benefits	Allaby 2004
Consequence	The outcome of an event affecting objectives	ISO/IEC 27000: 2014 and ISO 310000: 2009
Consequence Analysis	Consequence Analysis is estimation of the effect of potential hazardous events	Australian Emergency Management Glossary (1998)
Contextual Vulnerability	A present inability to cope with external pressures or changes, such as changing climate conditions. Contextual vulnerability is a characteristic of social and ecological systems generated by multiple factors and processes.	IPCC 2014
Coping Capacity	The ability of people, institutions, organizations, and systems, using available skills, values, beliefs, resources, and opportunities, to address, manage, and overcome adverse conditions in the short to medium term.	IPCC 2014
	The ability of people, organizations and systems, using available skills and resources, to face and manage adverse conditions, emergencies or disasters.	UNISDR 2009
Critical Infrastructure (CI)	An asset, system or part thereof located in Member States which is essential for the maintenance of vital societal functions, health, safety, security, economic or social well-being of people, and the disruption or destruction of which would have a significant impact in a Member State as a result of the failure to maintain those functions.	European Commission: Council Directive 2008/114/EC

	Organizations and facilities that are essential for the functioning of society and the economy as a whole.	ISO/IEC TR 27019:2013
Critical Infrastructure (CI) Dependency	CI dependency is the relationship between two (critical infrastructure) products or services in which one product or service is required for the generation of the other product or service.	Rome et al 2015
Critical Infrastructure (CI) Element	Part of a CI. Can have sub-elements	Rome et al 2015
Critical Information Infrastructure (CII)	Critical information infrastructures ('CII') should be understood as referring to those interconnected information systems and networks, the disruption or destruction of which would have serious impact on the health, safety, security, or economic well-being of citizens, or on the effective functioning of government or the economy.	OECD Recommendation of the Council on the Protection of Critical Information Infrastructures C(2008)35
Critical Infrastructure (CI) Interdependency	The mutual dependency of products or services.	ACIP 2003.
Critical Infrastructure Protection (CIP)	All activities aimed at ensuring the functionality, continuity and integrity of critical infrastructures in order to deter, mitigate and neutralise a threat, risk or vulnerability.	Council Directive 2008/114/EC
Critical Infrastructure (CI) Sector	Economic sectors considered critical	Rome et al. 2015
Cyber Security	Cyber-security commonly refers to the safeguards and actions that can be used to protect the cyber domain, both in the civilian and military fields, from those threats that are associated with or that may harm its interdependent networks and information infrastructure. Cyber-security strives to preserve the availability and integrity of the networks and infrastructure and the confidentiality of the information contained therein	EC 2013a
Damage	Damage classification is the evaluation and recording of damage to structures, facilities, or objects according to three (or more) categories.	UN Department of Humanitarian Affairs, 1992
Decision	The result of making up one's mind regarding a choice between alternatives	Wijnmalen et al 2015
Decision Support	The structure process of activities that support decision makers and other stakeholders in coping with and resolving problems they are faced with.	Wijnmalen et al 2015
Disaster Risk Management	The systematic process of using administrative directives, organizations, and operational skills and capacities to implement strategies, policies and improved coping capacities in order to lessen the adverse impacts of hazards and the possibility of	UNISDR 2009

	disaster. **Note:** This term is an extension of the more general term "risk management" to address the specific issue of disaster risks. Disaster risk management aims to avoid, lessen or transfer the adverse effects of hazards through activities and measures for prevention, mitigation and preparedness.	
Disruption	Incident, whether anticipated (e.g. hurricane) or unanticipated (e.g. a blackout or earthquake) which disrupts the normal course of operations at an organization location.	ISO/PAS 22399:2007 Societal security - Guideline for incident preparedness and operational continuity management.
Driver (direct and indirect)	Any natural or human-induced factor that directly or indirectly causes a change to a given system. **Note:** A direct driver is a driver that unequivocally influences ecosystem processes, such as climate change, and can therefore be identified and measured to differing degrees of accuracy. An indirect driver is a driver that operates by altering the level or rate of change of one or more direct drivers. [Important indirect drivers include changes in population, economic activity, and technology, as well as socio-political and cultural factors.]	Adapted from Millennium Ecosystem Assessment 2005
Drought	A period of abnormally dry weather long enough to cause a serious hydrological imbalance. Drought is a relative term; therefore any discussion in terms of precipitation deficit must refer to the particular precipitation-related activity that is under discussion.	IPCC 2013
Ecosystem-based Adaptation (EbA)	The use of biodiversity and ecosystem services as part of an overall adaptation strategy to help people to adapt to the adverse effects of climate change.	Adapted from Abajo et al. 2015
Ecosystem Service Planning	A place-based approach that focuses on the creation, restoration and conservation of ecological structures to provide society with specific services from nature.	Wamsler et al. 2014
Efficiency	The good use of time and energy in a way that does not waste any.	http://dictionary.cambridge.org/dictionary/english/efficiency
Effectiveness	The ability to be successful and produce the intended results:	http://dictionary.cambridge.org/dictionary/english/effectiveness

Ensemble	A collection of model simulations characterizing a climate prediction or [climate] projection.	IPCC 2013
European Critical Infrastructure	Critical infrastructure located in Member States the disruption or destruction of which would have a significant impact on at least two Member States. The significance of the impact shall be assessed in terms of cross-cutting criteria. This includes effects resulting from cross-sector dependencies on other types of infrastructure.	Council Directive 2008/114/EC
Event	Occurrence or change of a particular set of circumstances. • An event can be one or more occurrences, and can have several causes. • An event can consist of something not happening. • An event can sometimes be referred to as an "incident" or "accident".	CIPedia® 2015 based on ISO/PAS 22399:2007 and ISO/IEC 27000:2014
Evolutionary Adaptation	For a population or species, change in functional characteristics as a result of selection acting on heritable traits. The rate of evolutionary adaptation depends on factors such as the strength of selection, generation turnover time, and degree of outcrossing (as opposed to inbreeding).	IPCC 2014
Exposure	The presence of people, livelihoods, species or ecosystems, environmental services and resources, infrastructure, or economic, social, or cultural assets in places that could be adversely affected	IPCC 2014
Extreme Weather Event	An extreme weather event is an event that is rare at a particular place and time of year.	IPCC 2013
Fluvial Flooding	Fluvial flooding occurs when a watercourse cannot cope with the water draining into it from the surrounding land. This can happen, for example, when heavy rain falls on an already waterlogged catchment.	*The Environment Agency, 2011.*
Green Infrastructure	Broadly defined as a strategically planned network of high quality natural and semi-natural areas with other environmental features, which is designed and managed to deliver a wide range of ecosystem services and protect biodiversity in both rural and urban settings. **Note:** Green infrastructure may incorporate both landscape and water features, the latter of which may be termed 'blue infrastructure'. Other terms include 'green-blue infrastructure' and 'green and blue infrastructure'	European Commission 2013b.
Grey Infrastructure	Familiar urban infrastructure such as roads, sewer systems and storm drains is known as 'grey infrastructure'. Such conventional infrastructure often uses engineered solutions typically designed for a single function.	Parliamentary Office of Science & Technology 2013
Hazard	The potential occurrence of a natural or human-induced physical event or trend, or physical impact, that may cause loss of life, injury, or other health impacts, as well as damage and loss to	IPCC 2014

	property, infrastructure, livelihoods, service provision, and environmental resources.	
	source of potential harm **Note**: In the context of climate change the term 'hazard' usually refers to climate-related physical events or trends or their physical impacts.	Modified from ISO Guide 73:2009, 3.5.1.4
Heatwave	A prolonged period of excessively hot weather, which may be accompanied by high humidity. There is no universal definition of a heatwave; the term is relative to the climate in the area with a locally identified threshold temperature.	UK Climate Projections 2009
Heat Stress	Heat stress occurs when the body's means of controlling its internal temperature starts to fail. As well as air temperature, factors such as activity rate, humidity and clothing worn may lead to heat stress.	Adapted from Health and Safety Executive (UK) 2017
Impact	Effects on natural and human systems (…) the term impact is used primarily to refer to the effects on natural and human systems of extreme weather and events and of climate change. Impacts generally refer to effects on lives, livelihoods, health, ecosystems, economies, societies, cultures, services and infrastructure due to the interaction of climate changes of hazardous climate events occurring within a specific time period and the vulnerability of an exposed society or system. Note: Impacts are also referred to as consequences and outcomes	Adapted from IPCC 2014
	The direct outcome of an event	CIPedia® 2015
Impact Chains	Permit the structuring of cause - effect relationships between drivers and/or inhibitors affecting the vulnerability of a system. Impact chains allow for a visualization of interrelations and feedbacks, help to identify the key impacts, on which level they occur and allow visualising which climate signals may lead to them. They further help to clarify and/or validate the objectives and the scope of the vulnerability assessment and are a useful tool to involve stakeholders.	BMZ 2014
Incident	Event that might be, or could lead to, an operational interruption, disruption, loss, emergency or crisis.	ISO/PAS 22399: 2007
Incremental Adaptation	Adaptation actions where the central aim is to maintain the essence and integrity of a system or process at a given scale.	IPCC 2014
Indicator	quantitative, qualitative or binary variable that can be measured or described, in response to a defined criterion	ISO 13065:2015, 3.27
Infrastructure	Infrastructure refers to all public and private facilities which are considered to be necessary for adequate public services and economic development. In most cases, the infrastructure is divided into technical infrastructure (e.g. transport and communications facilities, energy and water supply or wastewater disposal) and social infrastructure (e.g. schools, hospitals, shopping or cultural facilities).[1] [1] The definition of social infrastructure can vary as described in the social infrastructure entry which is divided into physical social	Translated from: Bundesamt für Sicherheit in der Informationstechnik, Bundesamt für Bevölkerungsschutz und Katastrophenhilfe (2013)

	infrastructure and institutional social infrastructure.	http://www.kritis.bund.de/SubSites/Kritis/DE/Servicefunktionen/Glossar/Functions/glossar.html
Inoperability	The degree of function loss of an object	Rome et al 2015
Likelihood	The chance of a specific outcome occurring, where this might be estimated probabilistically.	IPCC 2014
	chance of something happening	ISO/IEC 27000:2014 En (after ISO Guide 73:2009
Maladaptation	Actions that may lead to increased risk of adverse climate-related outcomes, increased vulnerability to climate change, or diminished welfare, now or in the future.	IPCC 2014
Mainstreaming	Deliberate perturbation in the natural order of the things and undermines the status quo to radically expand and enhance the topic under consideration.	Wamsler et al 2014
Mitigation (of climate change)	A human intervention to reduce the sources or enhance the sinks of greenhouse gases (GHGs) [and] human interventions to reduce the sources of other substances which may contribute directly or indirectly to limiting climate change, including, for example, the reduction of particulate matter emissions that can directly alter the radiation balance (e.g., black carbon) or measures that control emissions of carbon monoxide, nitrogen oxides, Volatile Organic Compounds and other pollutants that can alter the concentration of tropospheric ozone which has an indirect effect on the climate.	IPCC 2013
Organisation	Person or group of people that has its own functions with responsibilities, authorities and relationships to achieve its objectives **Note** The concept of organisation includes, but is not limited to sole-trader, company, corporation, firm, enterprise, authority, partnership, charity or institution, or part or combination thereof, whether incorporated or not, public or private.	SOURCE: ISO 14001:2015, 3.1.4
Passive Measure	It is a type of measure which does not use energy once it has been implemented. It normally refers to adaptation measures for buildings indoor environments.	Van Hoof et al 2014
Pluvial Flooding	Occurs when heavy rainfall overwhelms the drainage capacity of the local area. It is difficult to predict and pinpoint, much more so than fluvial or coastal flooding. Can also be called surface water flooding.	*The Environment Agency, 2011.*
Probabilistic Climate Projections	These are projections of future absolute climate that assign a probability level to different climate outcomes. This projection provides an absolute value for the future climate (as opposed to giving values that are relative to a baseline period) that assign a	Adapted from the UK Met Office 2014

	probability level to different climate outcomes.	
Outcome Vulnerability	Vulnerability as the end point of a sequence of analyses beginning with projections of future emission trends, moving on to the development of climate scenarios, and concluding with biophysical impact studies and the identification of adaptive options. Any residual consequences that remain after adaptation has taken place define the levels of vulnerability.	IPCC 2014
Recovery	The restoration, and improvement where appropriate, of facilities, livelihoods and living conditions of disaster-affected communities, including efforts to reduce disaster risk factors	UNISDR 2009
Reliability	Property of consistent intended behaviour and results	ISO/IEC 27000:2014
Resilience	The capacity of a social-ecological system to cope with a hazardous event or disturbance, responding or reorganizing in ways that maintain its essential function, identity, and structure, while also maintaining the capacity for adaptation, learning, and transformation (Arctic Council, 2013).	IPCC 2014
	The ability to function, survive, and thrive no matter what stresses happen and to skilfully prepare for, respond to, and manage a crisis. Finally, it should include the ability to return to normal operations as quickly as possible after a disruption.	NIAC 2009
	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.	UNISDR 2009
Risk	The potential for consequences where something of value is at stake and where the outcome is uncertain, recognizing the diversity of values. Risk is often represented as probability of occurrence of hazardous events or trends multiplied by the impacts if these events or trends occur. Risk results from the interaction of vulnerability, exposure, and hazard.	IPCC 2014
	effect of uncertainty on objectives **Note 1**: An effect is a deviation from the expected. It can be positive, negative or both. An effect can arise as a result of a response, or failure to respond, to an opportunity or to a threat related to objectives.. **Note 2**: Objectives can have different aspects and categories, and can be applied at different levels. **Note 3**: Risk is usually expressed in terms of risk sources, potential events, their consequences and their likelihood.	Modified from ISO**(FDIS)** 31000:2017; IPCC, 2014 (Note 4)

	Note 4: In the context of climate change risk is often represented as probability or likelihood of occurrence of hazardous events or trends multiplied by the impacts if these events or trends occur.	
Scenario	A plausible description of how the future may develop based on a coherent and internally consistent set of assumptions about key driving forces (e.g. rate of technological change, prices) and relationships.	IPCC 2013
Sensitivity	The degree to which a system or species is affected, either adversely or beneficially, by climate variability or change. The effect may be direct … or indirect.	Adapted from IPCC 2014
Social Infrastructure (Institutional)	The social infrastructure includes the humans, organizations and governments that make decisions and form our economy as well as our institutions and policies.	Chappin and van der Lei 2014
Social Infrastructure (Physical)	Schools, hospitals, shopping or cultural facilities	Unpublished working glossary of UP KRITIS and BSI, 2014
Stakeholder	Person or organization that can affect, be affected by, or perceive themselves to be affected by a decision or activity **Note**: A decision maker can be a stakeholder.	Adapted from: ISO 31000:2009
Stressor (climate and non-climate)	**A climate stressor** is a condition, event, or trend related to climate variability and change that can exacerbate hazards. Increasing frequency and intensity of drought conditions can be a climate stressor for forests and crops. Rising sea level is another climate stressor. **A non-climate stressor is** a change or trend unrelated to climate that can exacerbate hazards. Altering drainage patterns and replacing open land with roads and buildings are non-climate stressors for flooding hazards. Population growth along exposed coasts is another non-climate stressor.	US Climate Resilience Toolkit 2017
Transformative Adaptation	Adaptation that changes the fundamental attributes of a system in response to climate and its effects.	IPCC 2014
Threat	The likelihood of occurrence of a hazard or event with a harmful effect. In contrast to risk, a threat is not related to the impact it may cause.	CIPedia© 2015
Uncertainty	A state of incomplete knowledge that can result from a lack of information or from disagreement about what is known or even knowable	IPCC 2014
Urban (Urban Area)	Urban 'is a function of (1) sheer population size, (2) space (land area), (3) the ratio of population to space (density or concentration), and (4) economic and social organization.'	Weeks 2010
	The OECD-EU classification identifies functional urban areas	OECD 2012

	beyond city boundaries, to reflect the economic geography of where people live and work... Defining urban areas as functional economic units can better guide the way national and city governments plan infrastructure, transportation, housing and schools, space for culture and recreation. Improved planning will	
Urban Critical Infrastructure	An asset, system or part thereof located in an urban area which is essential for the maintenance of vital societal functions, health, safety, security, economic or social well-being of people, and the disruption or destruction of which would have a significant impact in an urban area as a result of the failure to maintain those functions	Adapted from Council Directive 2008/114/EC
Urban Critical Infrastructure System	Urban critical infrastructure from a systemic viewpoint. It is part of the urban system and simultaneously part of the national critical infrastructure system.	Rome et al 2015
Urban Heat Island	An urban heat island is a manmade area that's significantly warmer than the surrounding countryside — especially at night.	Met Office 2012
Urban System	System of urban areas (Urban settlements from a systemic viewpoint)	Rome et al 2015
Vulnerability	The propensity or predisposition to be adversely affected. Vulnerability encompasses a variety of concepts including sensitivity or susceptibility to harm and lack of capacity to cope and adapt. Note: Please see contextual vulnerability and outcome vulnerability	IPCC 2014
	Intrinsic properties of something resulting in susceptibility to a risk source that can lead to an event with a consequence	CIPedia© 2015
	Weakness of an asset or control that can be exploited by one or more threats	ISO/IEC 27000: 2014
Vulnerability Index	A metric characterizing the vulnerability of a system. A climate vulnerability index is typically derived by combining, with or without weighting, several indicators assumed to represent vulnerability	IPCC 2014
Wicked Problem	A problem that is categorized by a great number of uncertainties. These include: on the stakeholders involved, the boundaries of the problem, long term organisational developments and responsibilities, amongst others.	Adapted from Wijnmalen et al 2015. Please also see Rittel and Webber 1973.

3. The RESIN Glossary

Where there are multiple definitions for a term, a green highlight indicates the preferred term for RESIN.

4. References

Abajo, B., García-Blanco, G., Gutierrez, L., Martínez, J.A., Mendizabal, M., Nassopolous, H., Ehret, M., 2015. Adaptation approaches: characterizing, assessing and prioritizing towards implementation (State of the Art report 5, The RESIN Project). Available at: http://www.resin-cities.eu/resources/sota/approaches/

ACIP Consortium. 2003. Analysis and assessment for critical infrastructure protection (ACIP) final report, EU/DG Information Society and Media, Brussels, Belgium.

Australian Government, Attorney General's Department. 1998. Australian emergency management glossary, Australian Emergency Manuals, no. 3. Available at: https://www.ag.gov.au/EmergencyManagement/Tools-and-resources/Publications/Documents/Manual-series/manual-3-australian-emergency-glossary.pdf

Allaby, M., 2004. A Dictionary of Ecology. Oxford University Press, Oxford.

BMZ (Federal Ministry for Economic Cooperation and Development). 2014. The vulnerability sourcebook. Concept and guidelines for standardised vulnerability assessments. Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH, Bonn and Eschborn. Available at: https://gc21.giz.de/ibt/var/app/wp342deP/1443/wp-content/uploads/filebase/va/vulnerability-guides-manuals-reports/Vulnerability_Sourcebook_-_Guidelines_for_Assessments_-_GIZ_2014.pdf

Carter, J.G., Handley, J.., Connelly, A., 2015. Weather and climate hazards facing European cities (State of the art report 3, the RESIN project.). Available at: http://www.resin-cities.eu/resources/sota/hazards/

Chappin, E.J.L.; van der Lei, T. 2014. Adaptation of interconnected infrastructures to climate change: A socio-technical systems perspective. In: Utilities Policy 31, pp. 10 – 17

CIPedia© 2015. CIPedia©: A critical infrastructure protection and resilience resource. Available at: http://www.cipedia.eu

Connelly, A., Carter, J., Handley, J., Rome, E., Worst, R., Voβ, N., 2015. Vulnerability assessments: definitions, indicators and assessments. State of the art report (4), The RESIN project. Available at: http://www.resin-cities.eu/resources/sota/vulnerability/

European Commission (EC). 2006. Communication from the Commission of 12 December 2006 on a European Programme for Critical Infrastructure Protection, COM (2006) 786 final – Official Journal C 126 of 7.6.2007

EC, 2008. EC Council Directive 2008/114/EC of 8 December 2008 on the identification and designation of European critical infrastructures and the assessment of the need to improve their protection. OJEU, European Commission.

EC. 2013a. Joint communication to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions - cybersecurity strategy of the European Union: An open, safe and secure cyberspace, JOIN(2013) 1 final. Available at: http://eeas.europa.eu/policies/eu-cyber-security/cybsec_comm_en.pdf

EC, 2013b. European Commission. 2013. Building a green infrastructure for Europe. European Union: Brussels. Doi: 10.2779/54125

IPCC, 2012. Managing the risks of extreme events and disasters to advance climate change adaptation. A special report of Working Groups I and II of the Intergovernmental Panel on Climate Change. Cambridge University Press, Cambridge. Available at: https://www.ipcc.ch/pdf/special-reports/srex/SREX_Full_Report.pdf

IPCC, 2013: Annex III: Glossary [Planton, S. (ed.)]. In: Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Stocker, T.F., D. Qin, G.-K. Plattner, M. Tignor, S.K. Allen, J. Boschung, A. Nauels, Y. Xia, V. Bex and P.M. Midgley (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA. Available at: https://www.ipcc.ch/pdf/assessment-report/ar5/wg1/WG1AR5_AnnexIII_FINAL.pdf

IPCC, 2014: Annex II: Glossary [Mach, K.J., S. Planton and C. von Stechow (eds.)]. In: Climate Change 2014: Synthesis Report. Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Core Writing Team, R.K. Pachauri and L.A. Meyer (eds.)]. IPCC, Geneva, Switzerland, pp. 117-130. Available at: https://www.ipcc.ch/pdf/assessment-report/ar5/syr/AR5_SYR_FINAL_Glossary.pdf

ISO/PAS 22399:2007. Societal security - guideline for incident preparedness and operational continuity management.

ISO 31000:2009(en). Risk management — principles and guidelines.

ISO/IEC 27000:2014(en). Information technology — security techniques.

Nassopoulos, H., Ehret, M., Vuillet, M., Cariolet, J.M., Colomobert, M., Diab, Y., 2015. Resilience, adaptation and disaster risk reduction: concepts, definitions and application (State of the art report 2, the RESIN Project). Available at: http://www.resin-cities.eu/resources/sota/definitions/

National Infrastructure Advisory Council (NIAC). 2009. Critical infrastructure resilience: final report and recommendations, Department of Homeland Security (US). Available at: http://www.dhs.gov/xlibrary/assets/niac/niac_critical_infrastructure_resilience.pdf

Organisation for Economic Cooperation and Development (OECD). 2012. Redefining urban: A new way to measure metropolitan areas, OECD Publishing, Paris.

Parliamentary Office of Science & Technology (POST), Houses of Parliament [UK]. 2013. Urban green infrastructure, POSTnote, no. 448. Available at: http://www.parliament.uk/briefing-papers/POST-PN-448.pdf

Rittel, Horst W. J.; Melvin M. Webber 1973.Dilemmas in a general theory of planning policy Sciences 4, pp. 155–169.

Rome, E., Voss, N., Connelly, A., Carter, J.G., Handley, J.F., 2015. Urban Critical Infrastructure Systems (State of the art report 1, The Resin Project). Available at: http://www.resin-cities.eu/resources/sota/urbanci/

UK Met Office. 2014. UK Climate Projections: probabilistic climate projection. Available at: http://ukclimateprojections.metoffice.gov.uk/23210

United Nations (UN) Department of Humanitarian Affairs (DHA), 1992. Internationally agreed glossary of basic terms related to Disaster Management, DHA, Geneva. Available at:

http://reliefweb.int/sites/reliefweb.int/files/resources/004DFD3E15B69A67C1256C4C006225C2-dha-glossary-1992.pdf

United Nations Office for Disaster Risk Reduction (UNISDR), 2009. Terminology on disaster risk reduction, UNISDR, Geneva. Available at: http://www.unisdr.org/we/inform/terminology

Van Hooff, T., Blocker , B., Hensen, J.L.M., Timmermans, H. J. 2014. On the predicted effectiveness of climate adaptation measures for residential buildings. Building and Environment, 82, 300–316.

Wamsler, C., Luederitz, C., & Brink, E. 2014. Local levers for change : Mainstreaming ecosystem-based adaptation into municipal planning to foster sustainability transitions. Global Environmental Change, 29, 189–201. doi:10.1016/j.gloenvcha.2014.09.008.

Weeks, John R., 2010. Defining Urban Areas. In: Tarek Rashed und Carsten Jürgens (Hg.): Remote Sensing of Urban and Suburban Areas, Bd. 10. Dordrecht: Springer Netherlands (Remote Sensing and Digital Image Processing), p. 33–45.

Wijnmalen, D., Kamphuis, V., Willems, R., 2015. Decision support (State of the art report 6, The RESIN project). Available at: http://www.resin-cities.eu/resources/sota/decisionsupport/