PLACARD

Foresight promotion report for policy & decision-makers

Markus Leitner, Julia Bentz, Tiago Capela Lourenço, Rob Swart, Ingrid Coninx, Karin Allenbach & Guillaume Thibaut Rohat

Work Package 4 – Institutional strengthening

Task 4.3 – Promote Foresight activities

December 2019

www.placard-network.eu

A tribute

With the sudden passing away of Guillaume Rohat on October 2, 2019 at the age of 28, we lost a brilliant researcher and a radiant personality who was appreciated by all.

Holder of a Master's degree in environmental sciences, and a PhD candidate at the University of Geneva and the University of Twente, Guillaume had just submitted his thesis entitled "Disentangling the contribution of socioeconomic pathways to future climate-related risks: The case of heat stress." His research had already featured in high-level publications and press articles, as well as winning several awards. His doctoral work on climatic and socio-economic scenarios and his experience in e-learning allowed him to contribute substantially to PLACARD, in particular to the Foresight activities since 2016.

An example of high scientific standards, interdisciplinarity, involvement and availability for all, Guillaume will continue to shine long after his premature death.

This report should be referenced as:

Leitner, M., Bentz, J., Capela Lourenço, T., Swart, R., Coninx, I., Allenbach, K. & Rohat, G.T. 2019. Foresight report for policy- and decision-makers. PLACARD project, FC.ID: Lisbon.

Contents

1. Introduction

Increasing resilience is the common goal of both the Disaster Risk Reduction (DRR) and Climate Change Adaptation (CCA) communities. Thus, closer collaboration between them can lead to a number of benefits.

The PLACARD project supports collaboration and maximises these benefits. More specifically, PLACARD aims to establish a coordination and knowledge exchange platform to support multi-stakeholder dialogue and consultation between CCA and DRR research, policy and practice communities, and across scales.

In order to achieve this goal, PLACARD provides a common 'space' where CCA and DRR communities meet, share experiences and create opportunities for collaboration.

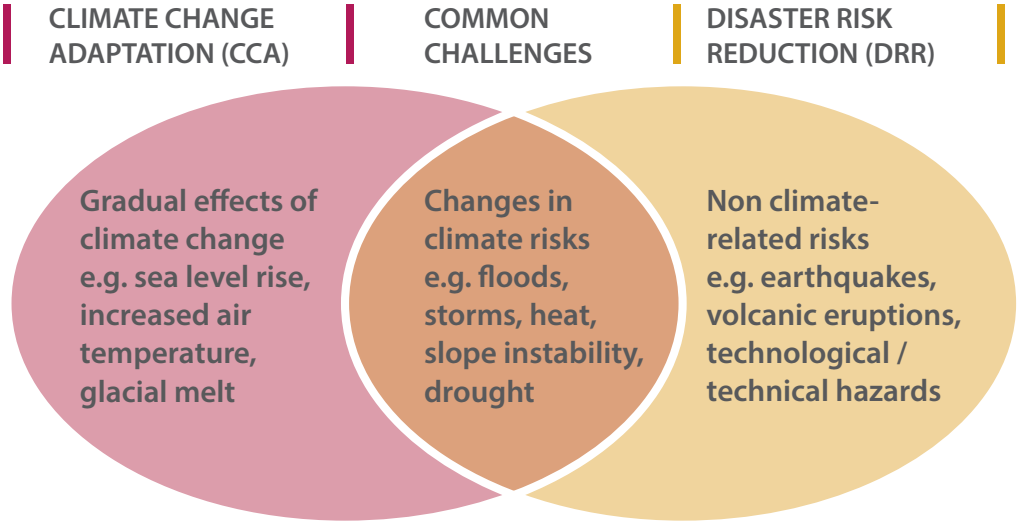
The following PLACARD report was prepared within Task 4.3 (Promote Foresight), with the aim of promoting the cooperative use of foresight methods by the CCA and DRR communities. Foresight and its methods are useful for CCA and DRR collaboration, as it is a systematic, participatory, future-intelligence-gathering and medium-to-long-term vision-building process aimed at enabling present-day decisions and mobilising joint actions (European Foresight Platform (EFP). In the project proposal, PLACARD identified joint foresight methodologies and the process of developing foresight as opportunities to help in identifying and creating synergies as well as increasing coherence in and between CCA and DRR activities. This report investigates different foresight methodologies and how they may be effectively applied to better integrate CCA and DRR in research, policy and practice.

1.1. The context of foresight

Foresight can provide benefits in addition to a useful toolbox (foresight methods) to integrate and increase coherence between DRR and CCA communities and activities. Figure 1 Schematic representation showing how CCA and DRR overlap. highlights some common challenges and overlapping areas for CCA and DRR.

PLACARD activities with both communities (see annexes I and II) have demonstrated that joint development and application of foresight methods is expected to foster collaborative activities and support the mainstreaming of CCA into DRR, and vice-versa. In this report, we look at the present and future potential of foresight-related science, policy and practice to enhance CCA and DRR and identify some key implications for decision-making.

Figure 1 Schematic representation showing how CCA and DRR overlap.



With the support of foresight methods, the elements common to both CCA and DRR – dealing with climate-related risks (see Figure 1 Schematic representation showing how CCA and DRR overlap.) – can be explored in the context of the COP21 Paris Agreement on climate change and the Sendai Framework for Disaster Risk Reduction, both major steps towards increasing resilience to climate-related extreme events. Long-term risk, vulnerability and response analyses in support of these two agreements and the Intergovernmental Panel on Climate Change (IPCC) assessment reports, tend to be dominated by the development and formal analysis of Representative Concentration Pathways (RCPs) and Shared Socioeconomic Pathways (SSPs). Such analyses are an important mechanism to advance analytical knowledge about future risks and vulnerabilities, yet they constrain creative analysis of risks and opportunities in support of action. Also, foresight can play an important role in identifying priorities for future research, for example, in the context of the new Horizon Europe Mission on Adaptation to Climate Change which includes Societal Transformation. PLACARD sees a complementary role for more and broader (qualitative and quantitative) foresight methods to be implemented by diverse experts and stakeholders to explore future vulnerabilities, risks, and opportunities.

1.2. Report aim and structure

With this report, PLACARD aims to explore and enhance the potential role of foresight to support and facilitate more effective ties and collaboration between the DRR and CCA communities.

It aims to explore the potential role of foresight in integrating DRR and CCA through an analysis of 20 of the most commonly applied foresight methods, as described in the literature. The report reviews each method with regard to its definition, strengths and weaknesses, form of application, and current application in CCA and DRR science and/or policy activities.

In addition, the report aims to promote the application of foresight methods to CCA and DRR science and practice, and to contribute to the setting of a joint research agenda on foresight.

Following an introduction in chapter one, chapter two explains foresight in more detail and describes some of its potential applications in DRR and CCA. Chapter three showcases and describes different foresight methods, providing references and analysing both the strengths and weaknesses of each method. Chapter four showcases the potential role of foresight methods in DRR and CCA, and in the support of policy- and decision-makers. The main reflections, conclusions and future opportunities for foresight to connect and improve integration between CCA and DRR are described in chapter 5.

2. Definition and methods

In this report we explore the application of foresight and foresight processes as a "multi-method" forward-looking toolkit that can be of relevance for CCA and DRR, as well enhancing integration across science, policy and practice communities.

2.1. What is foresight?

Foresight development relies on a set of forward-looking approaches that aim to help decision-makers explore and anticipate in a participatory way what might happen, prepare for a range of possible futures, influence and shape those futures.

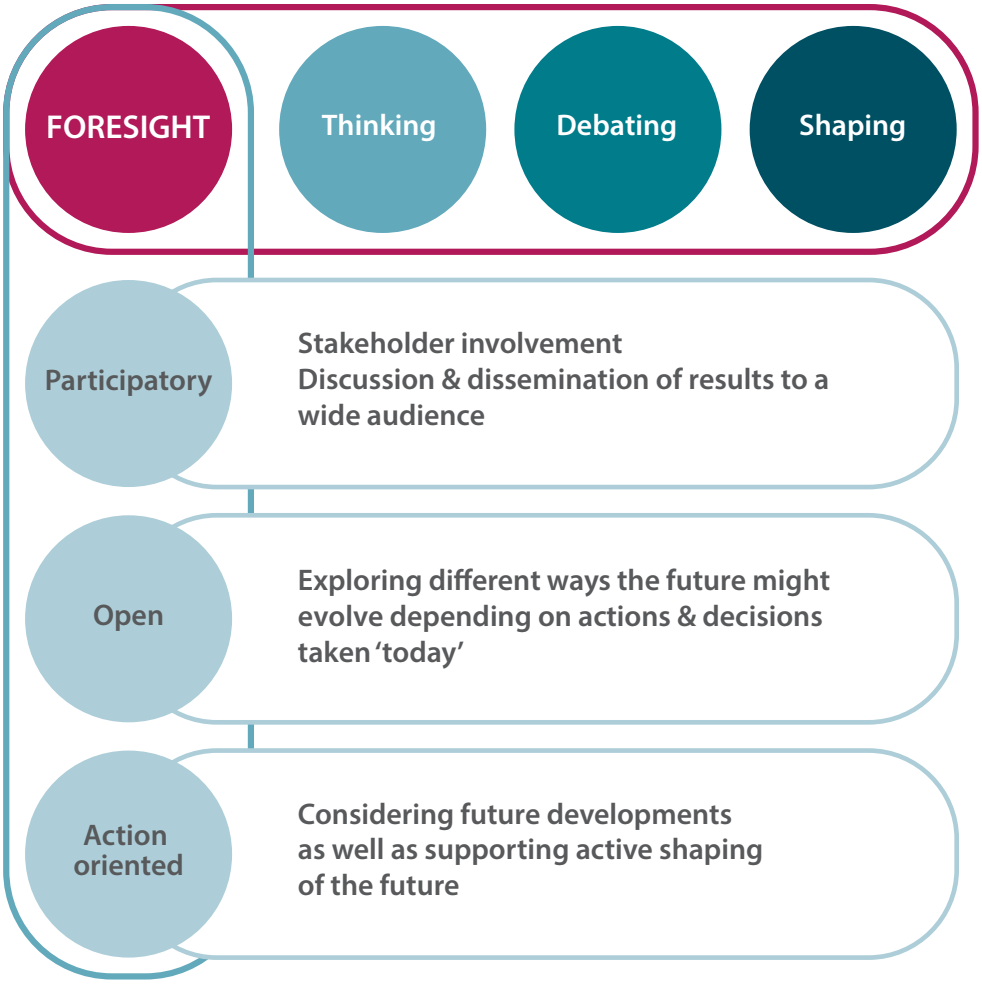
Foresight typically involves systematic, participatory, future-intelligence-gathering and medium to long-term vision-building processes to uncover a range of possible alternative future visions (FLIS Interest Group). Foresight is about different methods and tools considering different possible future developments and their integration into decision-making today, thus thinking, debating and shaping the future (JRC, 2001).

It is very important to distinguish between foresight and forecast (prediction, or prognosis, of the future). Foresight is a **process rather than a technique**. It does not **aim to predict** the future, but **consider, debate and shape the future** in a participatory, open and action-oriented way, through defining, and living up, to common long-term visions and desired future conditions (see Figure 2: The multiple roles of foresight. Redrawn from JRC For-LEARN.).

2.2. Potential for foresight application in CCA–DRR collaboration

Foresight methods have reportedly been used in both CCA and DRR related activities, but are often not referred to as foresight. For example, quantitative modelling and scenario analysis to understand the frequency and intensity of hazards connected to climate-related extremes are commonly used by CCA and DRR researchers, but are seldom called foresight. In addition, these methods are usually restricted to the aspects of risk that can be quantified, and do not explore response options. This raises the need to apply other forward-looking methodologies to cover the response decision-making element of the problem.

Figure 2: The multiple roles of foresight. Redrawn from JRC For-LEARN.



By considering a broader set of foresight methods, CCA and DRR research efforts could, in principle, enhance their integration into policy development and practical climate actions. For example, promoting the coordinated use of foresight methods could have a potential beneficial impact in helping to strengthen the link between international frameworks such as the UNFCCC Paris Agreement, the Sendai Framework and the Sustainable Development Goals (SDGs), across time and across scales, by exploring, for example, their implications for European, national and local action.

Foresight methods can be used in the interface between CCA and DRR by focusing on changes in weather patterns and associated climate-related extreme weather events (see Figure 1 Schematic representation showing how CCA and DRR overlap.). These events carry considerable consequences for Europe, as they have impacts on the vulnerability of communities across the continent, and expose them to environmental risks (Hov et al., 2013). This need was confirmed in the recent EEA report on climate change, impacts and vulnerability in Europe 2016 which states that "Humans have significantly changed the climate and increased the magnitude of many extreme weather events", and that "climate-related extremes such as heat waves, heavy precipitation and droughts are increasing in frequency and intensity in many regions." (EEA Report, No1/2017). These statements are based on quantitative modelling of climate and weather processes. However, the limitations of quantitative models are that they do not provide comprehensive guidance on how risks for human and natural system are changing, and how these risks can be reduced.

The application of foresight methods may therefore help to explore how to reduce vulnerability to climate-related extremes in different stages of the policy process, for example, through a combination of quantitative (scenarios, modelling) and qualitative (participatory) methods of gathering relevant information and providing solutions. One such example focuses on the emergency management authorities of Norway, Denmark, Sweden, Iceland and Finland, who are collaborating through the Nordic Forum for Risk Analysis and Strategic Foresight to improve collective understanding and learning on common disaster risks. Here a regional risk assessment of a volcanic eruption originating in Iceland was carried out, highlighting the use of foresight in disaster preparedness (EC, SWD (2017) 176 final).

Furthermore, in order to improve and advance disaster risk management, we need a greater focus on foresight techniques and their integration in risk governance (Aubrecht et al., 2011). This may lead to more active and transparent communication and public participation in risk management, which can then contribute to the reduction of future risks and impacts in the light of a changing climate.

Foresight can play different functions in supporting policymaking, such as (Da Costa et al., 2008):

- **Informing policy**: generating insights with regard to the dynamics of change, future challenges and options;
- **Facilitating policy implementation**: enhancing the capacity for change within a given policy field by building common awareness of current and future challenges as well as new networks and visions among stakeholders;
- **Embedding participation** in policy-making and thereby improving transparency and legitimacy;
- **Supporting policy definition**: jointly translating outcomes from the collective process into specific options for policy definition and implementation;
- **Reconfiguring** the policy system in a way to address long-term challenges;
- **Symbolic function**: indicating to the public that policy is based on rational information.

The analysis of national assessments of the main risks of natural and man-made disasters across the EU 28 Member States and the six non-EU countries participating in the Union Civil Protection Mechanism (UCPM) highlights the need to strengthen methods and approaches, in the management of complex disasters, accounting for the long-term impacts of climate change and pressures on natural resources (EC, SWD (2017) 176 final). This report further indicates a need to apply foresight in this field and in the interface between CCA and DRR.

In order to support improved long-term risk related decision-making, that takes into account CCA and DRR in an integrated way, information on the adequate application of foresight methods in the policy cycle is required (see chapter 4). To our knowledge, there is a lack of decision-support based on the usage of foresight methods for a concerted CCA-DRR policy approach that covers the different steps in this cycle.

3. Review of foresight methods, short description, references, strengths and weaknesses

Foresight methods and the process of developing foresight can be a complex and highly interactive process. There is no "one-size fits-all" approach to organising a foresight exercise. Although each individual method has its own specific characteristics, there are common elements that form a basis for each: a deep understanding of the context in which it is embedded and a clear set of objectives. Thus, the context as well as the objective of the foresight need to be clear and the methods and processes must be selected according to the context and objectives. Only this will lead to a sound selection of the methods to be used in a foresight process.

3.1. Selected foresight methods, respective short descriptions, relevant references and further reading

This report explores a selection of foresight methods, which are commonly used in various different disciplines, even if they are often not explicitly labelled as "foresight". The selection (see Table 1) is based on the criteria that a given method is foresight and/or has foresight elements (see 2.1). The table provides useful references in order to gain more background information on the different methods. The context as well as the objective of the foresight must be clear, and the methods and processes must be selected according to the context and objectives. Only this will lead to an appropriate selection of the methods to be used in a foresight process.

Table 1: Selected foresight methods, respective short descriptions, relevant references and further reading for each selected foresight method

Foresight method	Short description	References & further reading
Adaptation Pathways	Adaptation pathways are a sequencing set of possible actions based on alternative external, uncertain developments over time. A central element is tipping points, which are the conditions under which an action no longer meets the clearly specified objectives. The Adaptation Pathways approach presents a sequence of possible actions after a tipping point.	Haasnoot et al., 2013; Dynamic adaptive policy pathways: A method for crafting robust decisions for a deeply uncertain world. Global Environmental Change 23, 485–498. Wise et al. 2014: Reconceptualising adaptation to climate change as part of pathways of change and response. Global Environmental Change 28, 325–336.
Back casting	Back casting aims to describe a desirable future, and then looking backwards from that future to the present to develop a pathway of actions needed to realise it. It is a method to develop normative scenarios and explore their feasibility and implications.	Philip J. Vergragt, Jaco Quist. 2011: Back casting for sustainability: Introduction to the special issue; For Learn: Foresight methodologies.
Causal Layered Analysis	Causal layered analysis works by identifying many different levels, and attempting to make synchronised changes at all levels to create a coherent new future. It identifies four levels: the litany; social causes; structure and the discourse that legitimises and support the structure; and metaphor and myth.	Sohail Inayatullah: Causal Layered Analysis – poststructuralism as method. Sohail Inayatullah, 2005. Causal Layered Analysis – Deepening the future.
Cross-impact analysis	Cross-impact analysis is a family of techniques designed to evaluate changes in the probability of the occurrence of a given set of events consequent on the actual occurrence of one of them.	Theodore J. Gordon, 1994: The cross-impact method. For-Learn: Foresight methodologies.
Decision modelling/ decision support tools	A decision model is a framework that assists a decision-maker in estimating the outcomes of different alternatives and quantifying the trade-offs inherent in choosing one alternative over another.	The futures group international: Decision modelling.
Delphi method	The Delhi method is a communication technique, which relies on a panel of experts. The experts answer questionnaires in two or more rounds and after each round revise their earlier answers. It is expected that during this process the range of answers will decrease.	UK Government: Futures Toolkit. Beta Version. OECD: Schooling for Tomorrow – Knowledge Bank.

Foresight method	Short description	References & further reading
Drivers/ Trend/ Megatrend Extrapolation	Trend extrapolation first identifies a trend that is apparent over time, and then projects it forward based on data concerning the rates of change and the extent of change achieved.	For-Learn: Foresight methodologies.
Gaming	Games are devised to mirror real life planning scenarios or to teach specific skills.	For Learn: Foresight methodologies.
Horizon Scanning	Horizon scanning is a technique for detecting early signs of potentially important developments through a systematic examination of potential threats and opportunities.	OECD: Schooling for Tomorrow – Knowledge Bank.
Morphological analysis/ Relevance Trees	Morphological Analysis & Relevance Trees are normative methods, which start with future needs or objectives, and then seek to identify the circumstances, actions, technologies, etc. required to meet them. They are used to analyse complex situations with the purpose of organising information in a relevant and useful way in order to stimulate new ways of thinking.	For-Learn: Foresight methodologies.
Narratives	Narratives are stories or "storied ways of knowing" about how the future may evolve.	Jana-Axinja Paschen and Ray Ison, 2014: Narrative research in climate change adaptation – Exploring a complementary paradigm for research and governance. Research Policy 43, 1083-1092.
Road mapping	A roadmap is a collaborative foresight process that produces a broad set of plans and strategies to reach a future goal. Roadmaps are normative tools that involve step-by-step progress and learning.	For-Learn: Foresight methodologies.
Scenarios/ scenario planning	Scenarios are storylines or images that describe a potential future developed to inform decision-making under uncertainty. Scenarios can combine narratives with quantitative information.	Edward Parson, Virginia Burkett, Karen Fisher-Vanden, David Keith, Linda Mearns, 2007: global change scenarios: their development and use. US Department of Energy Use. Michael J Blyth, 2005: Learning from the future through scenario planning. Four Scenes Pty Ltd. OECD: Schooling for Tomorrow – Knowledge Bank.
Statistical / simulation modelling	Simulation modelling and analysis is the process of creating and experimenting with a computerised mathematical model.	For-Learn Foresight methodologies.

Foresight method	Short description	References & further reading
Structural analysis	Structural approach/ analysis relies on the combination of biophysical and economic models.	Jacques Arcade, Michel Godet, Francis Meunier, Fabrice Roubelat, 2016: Structural approaches to modeling the impact of climate change and adaptation technologies on crop yields and food security. Global Food Security 10, 63–70.
SWOT analysis	SWOT is an analytical method, which is used to identify and categorise significant internal factors (i.e. strengths and weaknesses) and external factors (i.e. opportunities and threats) that an organisation faces.	For-Learn: Foresight methodologies.
Systems perspective / systems approach / systems thinking	Systems approaches look at "the big picture" and consider the functions of a system's parts based on their relationships and within the system's context, resulting in a conceptual model of the system. Systems´ modelling is the process of turning conceptual models into computer models that can be used to understand or predict how a system will respond to changes.	Allenna Leonhard & Stafford Beer, 1994: The systems perspective: Methods and models for the future.
Three horizons practice	The 3H-framework includes three lines, each representing a system or pattern in the way things are done in a particular area of interest: an established first horizon pattern (business as usual), giving way to an emerging third horizon, via transitional activity in the second horizon.	Sharpe, W., Hodgson, A., Leicester, G., Lyon, A. & Fazey, I, 2016: Three horizons: a pathways practice for transformation. Ecology and Society 21(2):47.
Vision/ Visioning	Visioning is the creation of a preferred future that imaginatively captures values and ideals.	Jørgensen, M. S. & Grosu, D., 2007: Visions and visioning in foresight activities.
Wildcards	Wildcards are low-probability, high-impact events, which are outside the 'probable' realm, leading to abrupt changes. They can be used to complement or challenge "conventional wisdom" scenarios.	Walsh et al. 2015: Are wildcard events on infrastructure systems opportunities for transformational change? Futures 67, 1–10.
Climate Fiction (Cli-Fi)	Climate Fiction (Cli-Fi) is a subgenre of science fiction exploring climate change through new visions and narratives. Cli-fi novels and short stories have exploded over the last decade and are growing in popularity. Cli-fi seeks to understand the role of imagination in societies' responses to climate change, especially when the imaginative impulse leads to a compelling story.	Milkoreit, M. (2016). 10 The promise of climate fiction. In: Reimagining Climate Change (p. 171). Milkoreit, M. (2017). Imaginary politics: Climate change and making the future. Elementa Science of the Anthroposcene, 5(62). Nikoleris, A., Stripple, J. & Tenngart, P. (2017). Narrating climate futures: Shared socioeconomic pathways and literary fiction. Climatic Change, 143(3–4), 307–319.

Foresight method	Short description	References & further reading
Art and Arts-Based Methods	**Using artistic practices and creative approaches to inspire and engage people with CCA, mitigation and DRR. Art has the potential to generate spaces for active experimentation and to expand images and visions of potential futures. Artistic approaches have also a therapeutic potential which can help people to deal with the impacts of extreme weather events, providing cathartic forms of expressing and coping with trauma, dealing with difficult emotions and creating a space for disclosure and sharing.**	Art for Adaptation; Cosgrave, E. & Kelman, I. (2017). Performing Arts for Disaster Risk Reduction Including Climate Change Adaptation. Gabrys, J. & Yusoff, K. (2012). Arts, Sciences and Climate Change: Practices and Politics at the Threshold. Science as Culture, 21(1), 1–24. Galafassi, D., Tàbara, J. D. & Heras, M. (2018). Restoring our senses, restoring the Earth. Fostering imaginative capacities through the arts for envisioning climate transformations. Elemementa Science of the Anthropocene, 6(1), 69. Heras, M., Tabara, J. D. & Meza, A. (2016). Performing biospheric futures with younger generations: A case in the MAB Reserve of La Sepultura, Mexico. Ecology and Society, 21(2). Randall, R. (2009). Loss and climate change: the cost of parallel narratives. Ecopsychology, 1(3), 118–129. Tyszczuk, R. & Smith, J. (2018). Culture and climate change scenarios: The role and potential of the arts and humanities in responding to the '1.5 degrees target.' Current Opinion in Environmental Sustainability, 31, 56–64.

3.2 Strengths and weaknesses of each selected foresight method

Table 2: Strengths (green) and weaknesses (orange) of each selected foresight method describes the main strengths (green) and weaknesses (orange) of each method, as a first exploration of which foresight method to apply, keeping in mind that the context as well as the objective of the foresight needs to be clear and the methods and processes have to be selected according to the context and objectives. This will lead to a sound selection of the methods to be used in a foresight process.

A variety of methods can be used in foresight, each producing different, complementary results and insights. While the underlying ideas for choosing a certain method or methods are described in Table 1: Selected foresight methods, respective short descriptions, relevant references and further reading for each selected foresight method, the strengths and weaknesses are described in Table 2: Strengths (green) and weaknesses (orange) of each selected foresight method. The precise choice of the "right" combination of methods will always be a matter of judgment based on the particular context, nature of the issue, and aim of the exercise.

It is important to emphasise that there may be several foresight methods suitable for each context. After a pre-selection of potential methods for a given context, further reading suggestions can be found in Table 1: Selected foresight methods, respective short descriptions, relevant references and further reading for each selected foresight method. It may also be valuable to exchange views with foresight practitioners and experts in stakeholder engagement to discuss the selection of the most suitable method for a given context. In a follow-up exercise, Table 3 provides additional guidance to identify useful foresight methods for a specific set of DRR and CCA questions and applications.

Table 2: Strengths (green) and weaknesses (orange) of each selected foresight method

Foresight method	Strengths (green) & Weaknesses (orange)
Adaptation Pathways	• Generates insight into lock-ins and possible options that are still open; • Opportunities for mainstreaming adaptation may be considered to adjust timing of implementation of measures; • Powerful tool for supporting decision-makers explore and sequence a set of possible specific actions under high uncertainty; • Shows the timing of implementation of measures and the points at which decisions should be made on the selection of potential options.
	• Can be complex and time consuming to develop and communicate the method and results.
Back casting	• Ability to freely discuss problems with stakeholders who have conflicting interests; • It can be characterised as a social learning process; • Long-term perspective makes it possible to let go of the present way of meeting certain specific social needs.
	• Long project time needed. This leads to the possibility that the representatives change, leading to delays; • Relatively high budget needed; • Technological character can sometimes be to dominant, "scaring" representatives.
Causal layered Analysis	• Allows for a range of transformative actions; • Can be used by a wide range of individuals as it incorporates non-textual and poetic/artistic expression in the futures process; • Expands the range and richness of scenarios; • Layers participant's positions (conflicting and harmonious); • Leads to policy actions informed by alternative layers of analysis; • Moves the debate/discussion beyond the superficial and obvious to the deeper and marginal; • When used in a workshop setting, it leads to the inclusion of different ways of knowing of participants
	• Can be difficult and time consuming to implement and communicate.
Cross-impact analysis	• Forces attention to chains of causality.
	• The collection of data can be fatiguing and tedious; • A ten-by-ten matrix requires that 90 conditional probability judgments be made, a 40-by-40 matrix requires 1,560 judgments.

Foresight method	Strengths (green) & Weaknesses (orange)
Decision modelling/ decision support tools	• Decision models can gather vast quantities of data and avoid common biases that undermine human judgment; • Wide application, existence of models for policy and practice; • Models are useful in predicting things we cannot control.
	• Insufficient in predicting human behaviour.
Delphi	• Anonymity of responses from panel experts; • Reliable and creative exploration of problems or the production of suitable information for decision-making.
	• Great attention must be given to the choice of participants; • Multi-round studies require a great deal of time; • Questionnaires must be meticulously prepared and tested to avoid ambiguity.
Drivers/ Trend/ Megatrend Extrapolation	• A simple method of forecasting; • Not much data required; • Quick and cheap.
	• Assumes past trends will continue into the future – unlikely in many competitive environments; • Unreliable if there are significant fluctuations in historical data; • Ignores qualitative factors (e.g. changes in tastes and fashions).
Gaming	• Enjoyable way to get people working together; • Good way to help people understand the planning process and other people's viewpoints; • Particularly useful at an early stage of any community planning activity or as a way of preparing people for a specific future challenge.
	• Imagination needed for specific roles; • Strategic game behaviour and advance of knowledge by some stakeholders; • Gaming implicitly assumes room for play for all stakeholders.
Horizon Scanning	• Provides useful evidence base to explore future issues and create management approaches to respond to them.
	• Lacks systematic, standardised approaches for the interpretation of information; • Resource intensive, intensive effort.
Morphological analysis	• Powerful intellectual stimulus to illustrate a problem or issue in comprehensive detail and with important relationships in both current and potential situations; • Stimulus for the invention of new alternatives that fill these gaps; • Systematic analysis of the current / future structure of an area / domain as well as key gaps.
	• If the underlying thought processes are not insightful, the outcomes of this method will be weak; • Requires critical judgement thus the possibility of human error is present.
Narratives	• Framing power and critical theoretical and methodological potential can help to reshape adaptation practice; • Stimulating creativity and interaction between stakeholders with different skills and experience.
	• Results are dependent on the narrators and are context-specific; • Requires good facilitation skills to co-create a consistent imaginative story.

Foresight method	Strengths (green) & Weaknesses (orange)
Road mapping	• Creates a sense of agency; • Reduces uncertainty in more manageable ways through shared research and development.
	• Does not allow significant space for the emergence of new and uncertain future conditions that might require going down new paths.
Scenarios/ scenario planning	• Can help stakeholders break through communication barriers and see how current and alternative development paths might affect the future; • Useful when future is highly uncertain; • Ability to illuminate issues and break impasses makes them extremely effective in opening new horizons, strengthening leadership, and enabling strategic decisions.
	• Limited capacity to identify strategies for achieving different futures; • Difficult, complex process to develop scenarios.
Statistical / simulation modelling	• Experimentation in limited time; • Reduced analytical requirements; • Easily demonstrated models.
	• Cannot give accurate results when the input data are inaccurate; • Cannot provide easy answers to complex answers; • The variables and data chosen for the model are still subjective, although the calculations suggest objectivity; • It is often non-transparent and difficult to explain what the model does and how it is calculated.
Structural analysis	• Captures key knowledge across multiple areas of expertise; • Flexibility in linking different models (climate, non-climate) together with socioeconomic analysis.
	• Time consuming method; • Subjective nature of the selected list of variables.
SWOT analysis	• Can be used as a dynamic part of the management and business development process.
	• SWOT analysis can help foresight preparation and is a good starting point for the discussions in foresight, but is not a core foresight method.
Systems perspective/ systems approach/ systems thinking	• Strong when looking at the "big picture"; • Once a decision has been reached, the implementation usually proceeds more smoothly and encounters less resistance.
	• It involves finding a common understanding, what may be a messy and emotional series of discussions; • To be fully effective, enough data must be gathered over enough time to match the variety of the situation; • If an organization or community does not have much experience with participatory methods, a slower process may ensue.
Three horizons practice	• Allows incorporation of different dimensions of existing theories; • Simple framework to help work with complexity, easily communicated; • Highly accessible to diverse participants (including children); • Development of future consciousness.
	• Requires good facilitation skills.

Foresight method	Strengths (green) & Weaknesses (orange)
Vision/ Visioning	• Encourages discussion, deliberation, and the exchange of thoughts; • Helps identify different views on the issues and actions available drawing on stakeholders' views, experiences and resources; • Facilitates the framing and re-framing of perceptions and conceptions of problems, resulting ultimately in greater social learning.
	• Skilled facilitators needed; • Trust and recognition are important in order to ensure participants are willing to share information.
Wildcards	• Enables the consideration of alternative futures; • Ability to 'stretch' and 'expand' current thinking; • Discussions on wildcard events allow decision-makers to critically reflect upon potential outcomes of a range of models or scenarios.
	• Difficulty in considering plausibility of wild card events/development; • Assessing actions in response to wild cards.
Climate Fiction	• Fictional accounts of possible futures facilitate imagination processes; • Opportunities to consider and evaluate visions and their various dimensions of (un)desirability when considered as real-world trajectories; • Playful and fun approach to climate science; • Fiction can shape both cognitive-individual and social-collective imagination processes; • Fiction writing as well as reading can facilitate and boost imagination processes, offering opportunities to consider and evaluate these visions and their various dimensions of (un) desirability when considered as real-world trajectories.
	• Dystopian images of the futures may increase existing anxiety and depression about future.
Art and arts-based methods	• Engagement of emotional, affective domains; • Possible integration of values, social norms, systems and worldviews; • Use creativity to addressing complex issues: Artists are often at the forefront of innovation for novel ways of addressing problems, free from disciplinary constraints; • Integrating the practical, personal and political dimensions of climate change
	• Limited research on potential and guidelines for the use of arts-based methods for CCA and DRR; • Dependence of professional facilitators and artists

4. Potential role of foresight methods in CCA-DRR supporting policy- and decision-makers

The range of foresight methods previously discussed can be applied in many different contexts for different objectives. Operating between 2009 and 2012, the European Foresight Platform identified more than 250 examples of foresight being used, many of which are based in Europe. In the context of the PLACARD project, we are mainly interested in application of foresight as an approach to facilitate connection and integration between the CCA and DRR communities, with the ultimate aim of arriving at more effective and efficient solutions to reduce vulnerabilities to weather-related extreme events. The emphasis is on governance, policy development and research programming in Europe, in the areas of CCA and DRR.

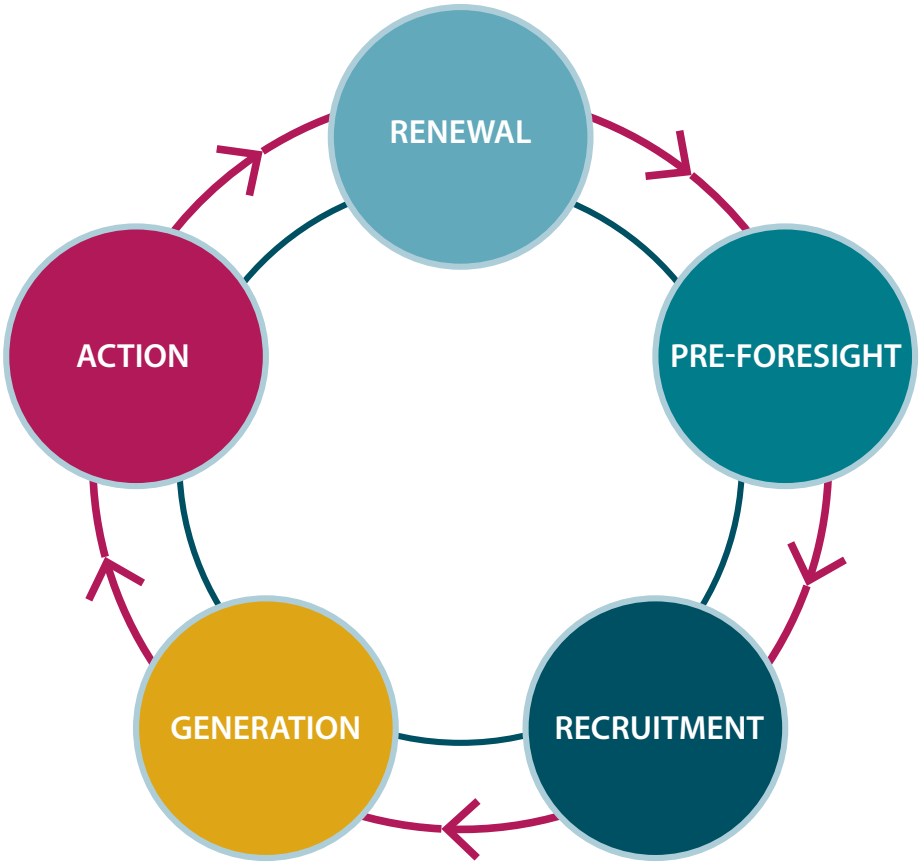
4.1. Foresight exercise as a common approach useful for CCA and DRR integration

A common approach undertaking a foresight exercise (depending on the foresight method used) is to go through the five phases: **pre-foresight**, **recruitment**, **generation**, **action** and **renewal** (Figure 3, Miles (2002) and Popper (2008)). Throughout these five phases, different methods can be applied, depending on the desired outcome, the targeted group and the degree of uncertainty of the available information.

Pre-foresight or scoping: objectives and the time-horizon are defined, usually more than 10 years. The scope can be geographical, sectoral or multi-level, as in the case of CCA and DRR.

Recruitment: an analysis of all players and interested or connected stakeholders based on criteria such as relevance, relation intensity and potential conflicts. The challenge for CCA and DRR is that actors vary from local to global and from a range of disciplines such as policy, research, public administration and practice.

Figure 3: Systemic look at foresight process by Ian Miles (2002) who outlined five complementary phases – Redrawn from Dr Rafael Popper, Slide 4



Generation: a broad portfolio of traditional and creative methods can be applied to combine knowledge, analyse and synthesise new information and visions for the future. In the 2017 PLACARD foresight training, megatrends as drivers of future change were used. This relates to the approach applied at the first PLACARD Foresight workshop in October 2016 – see the PLACARD background paper (Deliverable D3.1 – First set of background materials), Annex I – PLACARD Foresight Workshop and Annex IV – PLACARD Foresight Workshop: facing the future of Europe's climate, 11-12 December, 2018.

Action: identify possible futures for each driver – in this case, considering the megatrend approach.

Renewal: focuses on evaluating – learning, evaluation and dissemination.

Looking at the foresight process above, common elements from foresight to support CCA and DRR can be distilled:

- CCA and DRR both emphasise the importance of participatory approaches in engaging different actors at different levels and sectors – the broad menu of qualitative and quantitative foresight methods offers opportunities to help with these activities.
- DRR focuses attention mainly on changes in weather extremes, while CCA addresses longer-term concerns in enhancing resilience – a multi-method foresight approach using tools such as analysis of megatrends, wildcards and disruptors will add to the scenario approach common in climate change analysis.
- Foresight tools can help to encourage strategic thinking and prioritisation. The goal of a foresight exercise for CCA and / or DRR should be clearly defined.

- A foresight toolbox has multiple purposes, so the choice of methods should be open-minded and focused on the specific target, objective and time-horizon of a particular problem. The range of methods includes foresight-specific options as well as cross-disciplinary – several can be combined.
- Foresight helps to look beyond immediate political cycles:
  - » anticipate change and strengthen prevention and preparedness for future risks
  - » decide on disaster risk reduction and climate change adaptation priorities
  - » propose, for example, scenarios and models of multiple futures to help inform risk reduction policy-making
  - » it is essential to overcome natural short-sightedness created by day-to-day views and short-term political priorities

4.2. Relevance of foresight methods and application for CCA and/or DRR

Foresight methods are often used to support technology assessment and research programming, or to support political agenda setting. For example, in Europe, foresight methods have been frequently used to inform policy debates, often in the form of scenarios. The recent White Paper on the Future of Europe is a good example of this (EC, 2017). Drafted by the European Commission, this paper offers five scenarios for how the European Union could evolve, depending on the choices made, and can be seen as the start of a political debate. In 2015, a Foresight exercise from the European Commission developed two scenarios for Europe and derived three principles for future research programming from its analysis: Openness (Open Innovation, Open Science, Open to the World), Experimentation and Flexibility; and European-level cooperation (EC, 2015). In a similar vein, the European Commission-funded BOHEMIA project has developed scenarios as the basis for a discussion about the future EU research programming, scenarios "that navigate between megatrends – forces that drive the future of the world and our planet – and the policy goals and values of the European Union" (Ricci et al., 2017). The BOHEMIA report kick-starts the political debate by offering a number of additional principles[1] for European research and innovation that emerge from the scenarios.

In this new area of transnational research in Europe, many Joint Programming Initiatives (JPIs) are using foresight to support their strategic programming activities, albeit most frequently by using existing sources. Only JPI Oceans (Healthy & Productive Seas and Oceans) and JPI HDHL (A Healthy Diet for a Healthy Life) apply foresight for creating a shared vision, while JPI Urban Europe is the only JPI which focuses explicitly on issues beyond 2020, and plans to repeat this regularly (Haegeman et al., 2017). In the area of agriculture research, the Standing Committee on Agricultural Research (SCAR) regularly engages in foresight exercises in collaboration with Directorate-General for Research and Innovation (DG R&I) to identify emerging priority topics which informed the development of the research agenda of the transnational Joint Programming Initiative (JPI) FACCE (Food Security, Agriculture & Climate Change).

1 Build resilience by developing options before, rather than after, a crisis strikes; Experiment in real world settings; Learn from the best; Get the governance right – inclusiveness and fairness as policy principles; Look to the cities as laboratories; Connect and collaborate, across sectors; Be open. https://era.gv.at/object/news/4216

In the area of climate change, the long-term nature of the projected changes and impacts, and the transformative character of solutions gives foresight a prominent role in policy development, most frequently through quantitative model-based scenario analysis (for example, in IPCC and EU scenario work). In the area of disaster risk reduction, foresight is less commonly used to inform policy development, the emphasis still being on analysis of the frequency and intensity of extremes in the past. Also, the recent Commission Staff working document: Overview of Natural and Man-made Disaster Risks the European Union may face (SWD (2017) 176 final) concludes: "Current timescales of risk assessments reflect a focus on immediate response needs. The long-term impacts of climate change, increasingly felt in Europe (for example, severe forest fire seasons, 100-year floods every decade, etc.), as well as long-term pressures on natural resources (for example, poor management practices and population growth) are often not adequately taken into consideration in disaster management. Recognising the impact of climate change could be more substantially reflected in the assessment of disaster risks, and in the approach to the collection of disaster loss and damage data. Defining trends and longer-term preventive measures to reduce the future burden on response requires the integration of climate change impacts, in particular for natural disasters." An exception is the UK, where in 2012 UK Government Office for Science organized a one-year participatory Policy Futures Foresight Project to provide advice to decision-makers on how science can inform the difficult choices and priorities for investing in disaster risk reduction, so that the diverse impacts of future disasters can be effectively reduced, both around the time of the events and in the longer term (UK Government Office for Science, 2012).

Illustrating the relevance for a given method for CCA/DRR for policy and research, Table 3: Development and application approaches for each selected foresight method, as well as examples of known applications to CCA and/or DRR provides an overview o applications to CCA and/or DRR based on existing examples and literature. The examples provided in Table 3: Development and application approaches for each selected foresight method, as well as examples of known applications to CCA and/or DRR, represent just a selection of applications, and is not intended to be exhaustive. The provided information aims to facilitate the choice of a suitable foresight method indicating how each method can be developed and applied. Qualitative methods (for example, expert interviews, participatory methods) are distinguished from quantitative methods (for example, modelling). This more practical information adds to the conceptual information provided in Table 1: Selected foresight methods, respective short descriptions, relevant references and further reading for each selected foresight method and Table 2: Strengths (green) and weaknesses (orange) of each selected foresight method.

Table 3: Development and application approaches for each selected foresight method, as well as examples of known applications to CCA and/or DRR		
Foresight method	What does application of the method involve?	Known applications to CCA and/or DRR (examples)
Adaptation Pathways	The Adaptation Pathways map, manually drawn based on model results or expert judgment, presents an overview of relevant pathways	**CCA:** Wise et al. 2015: Re-conceptualising adaptation to climate change as part of pathways of change and response; SWAP – Scenario Workshop with Adaptation Pathways: Creating a common vision for coastal adaptation pathways in Portugal
Back casting	Participatory work in complex situations with many stakeholders, where although there may be a desired common future vision, it is unclear how to reach it.	**CCA:** Carlsson-Kanyama et al. 2013: Barriers in municipal climate change adaptation: Results from case studies using back casting. **DRR:** Asian Development Bank, 2013: Investing in resilience: ensuring a disaster-resistant future.
Causal Layered Analysis	It is especially useful in workshops with individuals either of different cultures or different approaches to solving problems. It is best used prior to scenario building.	**CCA:** Gidley, J. Fien, J. Smith, J. Thomsen, D. and Smith, T. 2009. Participatory futures methods: towards adaptability and resilience in climate-vulnerable communities. Environmental Policy and Governance, 19 (6): 427–440. **DRR:** Milojević, I. & Inayatullah, S. (2015). Narrative foresight. Futures, 73, 151-162.
Cross-impact analysis	Literature review and/or expert interviews; expert judgments/ questionnaires/ group meetings/ interviews; cross-impact matrix.	**CCA:** Velmeyer & Sahin, 2014: Modelling climate change adaptation using cross-impact analysis.
Decision modelling/ decision support tools	Modelling Quantitative description of the cause-effect relationship between sets of causative factors and the set of evaluative measures that the decision-maker uses in order to judge the desirability of each alternative.	**CCA:** Observatório Clima Madeira. **DRR:** Michel-Kerjan et al. 2012: Catastrophe Risk Models for Evaluating Disaster Risk Reduction Investments in Developing Countries; Ley-Borrás & Fox: Using Probabilistic Models to Appraise and Decide on Sovereign Disaster Risk Financing and Insurance.
Delphi method	Expert interviews Apply at the beginning of the project to gain views on the issue at hand and define early questions.	**DRR:** Commission Staff Working Paper: Risk Assessment and Mapping Guidelines for Disaster Management (SEC (2010) 1626 final). **CCA:** Ecocities: Carter, J. G. and Sherriff, G. (2011) Spatial planning for climate change adaptation: identifying cross cutting barriers and solutions, Centre for Urban and Regional Ecology, University of Manchester.
Drivers / Trend / Megatrend Extrapolation	Ranging from participatory application analysing the perceived impact of megatrends to sophisticated models.	**CCA:** European Environmental Agency, 2014: Assessment of global megatrends – an update – Global megatrend 9: Increasingly severe consequences of climate change. **DRR:** Joint UNEP/OCHA Environment Unit 2012: Keeping up with megatrends: the implications of climate change and urbanisation for environmental emergency preparedness and response.

Gaming	Usage of available or development of new computer, board or other serious games.	**DRR:** UNISDR: Let's learn to prevent disasters: educational kit and risk land game; International Federation of Red Cross and Red Crescent Societies South East Asia Regional Office, 2010: Children in disasters- Games and guidelines to engage youth in risk reduction. **CCA:** Federal Ministry of Economic Cooperation and Development, 2011: The Systems Thinking Playbook for Climate Change. **CCA-DRR:** Red Cross Red Crescent Climate Center (expert : Margot Steenbergen).
Horizon Scanning	Desk research with a wide variety of source of information, e.g. STEEPLE framework.	**DRR:** Disaster Risk Assessment and Risk Financing A G20 / OECD Methodological Framework; Business continuity Institute: Horizon Scan Report 2017. **CCA:** SAMI Consulting: Strategic Evidence of Future Change Horizon Scanning evidence and analysis report.
Morphological analysis/ Relevance Trees	Manually drawn map based on model results or expert judgment, presents an overview of relevant objectives and actions required to meet them.	**CCA:** Ritchey 2011: Modelling Alternative Futures with General Morphological Analysis. **DRR:** Fernandez, Britton, and Ritchey: Application of a Prototype Morphological Model for Earthquake Disaster Risk Management.
Narratives	Semi-structured or open interviews or group work of stakeholders	**DRR:** Milojević, I., & Inayatullah, S. (2015). Narrative foresight. Futures, 73, 151-162; **CCA:** 6 Narratives of Climate Change at the Paris Summit; Huffington Pos.
Road mapping	Collecting, synthesising and validating knowledge, and representing the trends (imagination – extended look at the future for a chosen field) within graphical displays associated with support documents.	**CCA:** US Department of Defence 2014: Climate Change Adaptation Roadmap; Eastern Alliance for Greenhouse Action: Climate Change Adaptation Roadmap For Melbourne's East. **DRR:** World Meteorological Organization 2016: A Disaster Risk Reduction Roadmap for the World Meteorological Organization; European Forum for Disaster Risk Reduction: Roadmap for the Implementation of the Sendai Framework; FAO-WFP Joint Roadmap on Disaster Risk Reduction/Management (DRR/M) in West Africa and the Sahel.
Scenarios/ scenario planning	Modelling.	**CCA:** Socioeconomic scenarios, emissions scenarios, atmosphere and climate scenarios, impact scenarios. Examples: The IPCC Special Report on Emissions Scenarios (SRES): A1B, A1T, A1FI, A2, B1, B2; Representative Concentration Pathways (RCPs); Shared Socioeconomic Pathways (SSPs).
Statistical/ simulation modelling	Modelling.	**DRR:** Global Assessment Report on Disaster Risk Reduction (UNISDR)
Structural analysis	Modelling.	**CCA:** Islam et al. 2016: Structural approaches to modelling the impact of climate change and adaptation technologies on crop yields and food security.

SWOT analysis	Expert or stakeholder judgments.	**CCA:** Wang & Hills: Climate change adaptation in China: national policy and regional practice. **DRR:** Caribbean Disaster Emergency Management Agency, 2011: A Guidance Tool: A Manual for Mainstreaming Climate Change Adaptation into the CDM Country Work Programme.
Systems perspective/ systems approach/ systems thinking	Participatory process. This method considers first the elements in isolation and then in combination one by one.	**CCA:** Australian National Climate Change Adaptation Research Facility: Decision-making for Climate Change Adaptation – A Systems-Thinking Approach. **DRR:** UNISDR Global Assessment Report on Disaster Risk Reduction 2015 – Preparing For Complex Interdependent Risks: A System of Systems Approach to Building Disaster Resilience.
Three horizons practice	Multiday stakeholders' workshops or short exercises.	**CCA:** Climate change community action – Glasgow community and International Futures Forum (Sharpe et al. 2016).
Vision/ Visioning	Facilitated participatory workshops.	**DRR:** Unicef Children´s Charter – an action plan for disaster risk reduction for children by children. **CCA:** SWAP – Scenario Workshop with Adaptation Pathways: Creating a common vision for coastal adaptation pathways in Portugal; Community Visioning in CBA (Community Based Adaptation); Participatory Scenario Development and Future Visioning in Adaptation Planning: Lessons from experience Part I.
Wildcards	Participatory stakeholder workshops.	**CCA:** Walsh et al. 2015: Infrastructure adaptation & resilience towards climate related disasters. **DRR:** Walsh et al. 2015: Infrastructure adaptation & resilience towards climate related disasters.
Cli-fi	Both producing or consuming of cli-fi: Working with cli-fi can involve reading, listening or watching of climate fiction stories, and discussing generated emotions and feelings. It can also involve creative writing of stories and storytelling.	**CCA:** ECCA 2019 art exhibition Art for Change. Imagination and Climate Futures Initiative
Art	Interactive, co-creational processes/ workshops with/of art making Collaborations with artists	**CCA:** Project Art For Adaptation: www.arforadaptation.com; Odisseia Pelo Clima: Community theatre project for climate action SUSPLACE Toolkit Arts-based Methods: Pearson, K.R., Backman, M., Grenni, S., Moriggi, A., Pisters, S., Vrieze de, A. (2018). Arts-Based Methods for Transformative Engagement: A Toolkit. Wageningen: SUSPLACE. doi: 10.18174/441523 **DRR:** Cosgrave, E., & Kelman, I. (2017). Performing Arts for Disaster Risk Reduction Including Climate Change Adaptation.

4.3. Foresight experiences during PLACARD

Past experiences in CCA and DRR show that foresight methods have already been used at different levels, from international programmes to community level strategy development, with an emphasis sometimes on practice in a participatory mode, and in other cases taking a more academic, expert-driven approach. The examples demonstrate that a very wide variety of methods is actually being used in a range of settings with different objectives, and considering different time scales. However, the emphasis is usually on either a DRR or a CCA context, not on using foresight as a mechanism to facilitate integration, which is proposed in this report. It is likely that the choice of method in a particular case is as much motivated by the experience, expertise and skills of the people involved as by the specific demands of the challenge to be addressed.

It is apparent that people in both communities are used to working with foresight methods, albeit different to those shown in Table 3: Development and application approaches for each selected foresight method, as well as examples of known applications to CCA and/or DRR and with differing objectives, and thus would be open to using foresight as a mechanism to explore, both DRR and CCA. For DRR, this would imply the consideration of a longer time horizon and more attention to preventive responses; for CCA, it would stimulate consideration of the relevance of long-term changes for short-term impact and weather events which are more relevant for policy and practice. Connecting different people from the two communities by organising joined foresight activities to integrate CCA and DRR can also help to broaden the menu of methods, which can lead to interesting new or complementary insights.

During the PLACARD project several activities were developed to test how foresight could, in practice, work towards connecting CCA and DRR. Some examples are shown below.

Textbox 1: PLACARD foresight interactive activities 2016–2017

The first **PLACARD Foresight workshop** in October 2016 in Vienna using the megatrend methodology, we deepened our understanding of foresight as a tool to help integrating CCA and DRR (for detailed information see policy brief and Annex I).

Thirty five experts from three different science, policy and practice communities – CCA, DRR and foresight – joined the workshop to explore whether foresight can help to reduce climate vulnerabilities. The answer was positive: combining qualitative and quantitative foresight methods in visioning exercises can help to integrate the two issues. The diversity of participants led to very active discussions and break-out groups that focused on risks and possible integrated response strategies. Through an exploratory exercise, we also examined the implications of global megatrends when they combine with the unexpected impacts of extreme weather events.

Bringing the three communities together was a starting point: the workshop recommended seeking follow-up opportunities for connecting CCA & DRR using foresight methods, through research projects and by integration into projects working with stakeholders.

Foresight thinking is already used by CCA practitioners and policymakers through the long time-horizons in climate scenarios, and in accounting for uncertainties. However, qualitative methods would complement the focus on quantitative research currently used, and so widening the perspective.

Building foresight capacity in the DRR community may be more significant, shifting attention from emergency planning and response to prevention. We need to change people's perceptions about risks and vulnerability, and showcase the benefits of foresight thinking in decision-making, as well as highlighting the risks of not considering future change. Qualitative foresight methods may also provide better opportunities to stimulate engagement with decision-makers and stakeholders than complex quantitative methods, which often require a higher level of scientific knowledge and skills.

In addition, a session on Can foresight help integrating Climate Change Adaptation and Disaster Risk Reduction? was held at the 3rd European Climate Change Adaptation Conference (ECCA) in Glasgow 2017. The session title "Can foresight help to integrate Climate Change Adaptation and Disaster Risk Reduction?" focused on the complementary role for other options, for example, qualitative, foresight methods implemented by diverse experts and stakeholders to explore future risks, vulnerabilities and opportunities (see Annex II). Such foresight could improve coordination and collaboration between CCA and DRR in terms of science, policy and practice.

Textbox 2: PLACARD foresight interactive activities 2018–2019

In a successful **PLACARD Foresight workshop** in December 2018 in Brussels using the scenario approach, we deepened our understanding of foresight as a tool to help integrating CCA and DRR (for detailed information see policy brief and Annex IV). This was also based on a Foresight webinar "Exploring the use of foresight methods in climate resilience" held on May 30th 2018. In this workshop, foresight methods were used to explore possible futures for Europe and the consequences of dealing with climate change and disaster risks. This required reflections on Europe's long-term climate risks and policy objectives, the international context, and the integration of climate into economic, social and financial policies. The workshop focused on three of the Juncker scenarios (Scenario 2: Nothing but the Single Market; Scenario 3: Those who want more do more and Scenario 5: Doing much more together). In addition, three case studies were provided as more concrete examples to work with: Case 1: Heat and drought – heat, hardship and horrible harvests; Case 2: Floods – Paris, Hamburg and Prague are mopping up, but more floods to come; Case 3: Coastal impacts – storm surges along the European coasts cause loss of life and damage. This was followed by an exercise to identify the upsides and downsides of the scenarios for climate change adaptation (CCA) and disaster risk reduction (DRR) for each case study.

As a next step, the challenges for vulnerability (risk) and resilience (response) for each scenario were explored, followed by a joint exercise to identify the actions required to avoid challenges and seize opportunities for CCA and DRR. Finally, the findings of the previous exercises were translated into CCA and DRR policies and practice in Europe, including ways to put the outcomes into practice.

Choices about the future of the European Union have upsides and downsides for climate risks

A scenario in which Member States would do much more together would offer the best opportunities to enhance future resilience and manage climate risks.

At first sight, a scenario in which Member States would do much more together would offer the best opportunities to enhance future resilience and manage climate risks. Existing mechanisms such as the Union Civil Protection Mechanism and the EU Strategy on Adaptation to Climate Change along with their supporting implementation mechanisms such as knowledge networks, pooled resources and solidarity-based funding schemes could readily be strengthened. The EU's position in international climate negotiations would be bolstered. However, such a scenario also has the pitfalls of over-regulation, sluggish coordination and a mismatch between the slow development of formal guidelines and frameworks on the EU level versus the needs of fast decision-making to address urgent climate risks at local and regional levels. Expansion of the EU may further dilute or slow down CCA and DRR response capabilities.

A scenario in which the EU would re-center its focus on the single market could lead to innovative market-driven solutions to climate risks boosted by an increasing role of the private sector.

In such a scenario, much less coordination and cooperation can be expected in prevention, preparedness, response and recovery, and increased inequality between regions can be expected. However, this scenario may lead to innovative market-driven solutions to climate risks, boosted by an increasing role of the private sector, including, but not limited to, financial instruments such as in the insurance business.

In a scenario in which a limited number of Member States with similar challenges enhanced their collaboration on climate risks ("coalitions of the willing"), there would be a greater disparity in the rate of development between Member States with regards to science, economy and security and differences in the willingness to act. But Member States facing similar issues can move faster in developing solutions without waiting for other Member States to move at the same speed. This can lead to a tailored approach, with efficient and prompt response capabilities related to specific needs and innovations. Other Member States would have the opportunity of joining over time. In a scenario in which the EU would do less, but more efficiently, obviously future climate resilience will depend on the selection of CCA and DRR as one of the priority areas.

Such foresight could improve the coordination and collaboration between CCA and DRR in terms of science, policy and practice.

In addition, when looking into the future of Europe and its relevance for CCA and DRR the following conclusion could be drawn:

The EU's future is unknown. How can the EU manage extreme weather risks under this uncertainty?

- Not only from governance, but also from a climate perspective, the EU will look completely differently in a few decades. The current EU Strategy on Adaptation to Climate Change and the Union Civil Protection Mechanism require strengthening to effectively address the increasing risks posed by different possible EU futures.
- It is recommended that DG CLIMA guidance on developing adaptation strategies and DG ECHO advice on Risk Assessment are updated, taking into account the results of foresight work.
- The forward-looking approaches used in foresight should be showcased for all relevant actors, in order to help them to prepare for the range of possible futures across Europe , accounting both for "conventional" futures (diversions from current dominant pathways) and discontinuous futures (disruptive, systemic transformative risks and solutions).
- Advances that have been made in sharing of data, knowledge and good practice can be sustained, but also weakened or even nullified, depending on the direction the EU takes. Therefore, specific guarantees with effective institutional and financial support have to be developed both at the EU level and between Member States, in order to sustain or enhance existing mechanisms and ensure resilience in an uncertain future.
- There is a need for the continued building of a CCA and DRR expert community that should be at least partially independent from EU funding.
- Collaboration and cooperation between actors across administrative borders should be strengthened and agreement on logistics, legislation and distribution of resources between the EU and MS actors pursued.

Textbox 3: The potential of art and art-based methods in CCA, DRR and foresight

Art and art-based methods can potentially provide innovative solutions for adaptation and mitigation and DRR (Gabrys & Yusoff, 2012). This is attributed to art's capacity for creative imagination and serendipity, which can generate spaces for active experimentation and imagination (Bentz & O´Brien, 2019). Artistic practices and approaches are considered an effective way of developing both passion and an emotional connection with sustainability issues (Shrivastava, Ivanaj, & Ivanaj, 2012) and can serve as a powerful means of expanding potential visions of the future and developing new scenarios of change which is particularly relevant for foresight (Galafassi et al., 2018; Milkoreit, 2017; Tyszczuk and Smith, 2018). Art and music can also be effective in engaging an audience with climate change messages, audiences who may otherwise be unaware of the broad range of climate impacts.

Artistic approaches also have a therapeutic potential which can help people to deal with the impacts of extreme weather events, providing cathartic forms of expressing and coping with trauma, dealing with difficult emotions and creating a space for disclosure and sharing (Cosgrave & Kelman, 2017; Randall, 2009). These forms of interventions and collective work can also increase resilience of affected communities making them better prepared for eventual future events.

ECCA 2019 Art experience

For ECCA 2019, a programme of thought-provoking art, music and video was developed to explore how the arts can communicate with and inform people about the challenges society faces.

The conference opened with a live music and video performance by Tone Bjordam and Marten Scheffer. They performed a new work specially composed for the conference, built upon a recent article co-authored by Scheffer entitled Trajectories of the Earth System in the Anthropocene. This art and science collaboration provided the audience with a multi-sensory experience showcasing a transdisciplinary approach to the climate challenge.

An exhibition of Tone Bjordam's paintings, inspired by different biotopes, was hosted at the conference. The drive behind the Norwegian artist's practice is to create a space for reflection around processes in nature, and to achieve an in-depth understanding and a sense of feeling connected with the nature around us. Bjordam has a Master's Degree in Fine Arts from Oslo National Academy of the Arts and her work has been displayed in numerous countries around the world. Bjordam is particularly interested in finding ways to communicate science through art, especially the wonder that drives science.

Marten Scheffer is interested in unravelling the mechanisms that determine the stability and resilience of complex systems. Although much of his work has focused on ecosystems, he also worked with a range of scientists from other disciplines to address issues of stability and shifts in natural and social systems. With the help of a Spinoza award and an ERC advanced grant, he founded SparcS, and now works on finding generic early warning signals for critical transitions. He also co-founded the South American Institute for Resilience and Sustainability Studies (SARAS) and is currently a distinguished professor in ecology and mathematical biology at Wageningen University.

ECCA 2019 also hosted an exhibition of work from young artists. Entitled Art for Change, it was the result of collaboration between Artistic Secondary School Antonio Arroio, Lisbon and the Art for Adaptation project. More than 80 students of grades 11 and 12 engaged with climate change through transformative learning approaches, by approaching change as an experiment, and through climate fiction. Their artworks reflect their newly gained insights and critical thinking about the subject. The exhibition integrated posters produced with silk print and stencil techniques, and objects which aimed to question, highlight and reflect different aspects of climate change.

Art for Change aims to empower young people to explore new climate narratives and solutions, help to visualise the connection between global climate change and our daily actions, and reflect on the implications of individual and collective change towards more sustainable forms of living.

Parallel to the scientific program, conference participants were invited to the Art Room, where short films and videos on climate change were shown.

Finally, the conference closed with a musical performance by the children's choir of Santo Amaro de Oeiras, Lisbon. This choir participated in 2012 in the Global Rockstar competition, promoted by the United Nations, winning the first place with the song "My blue planet" and representing Portugal at the Rio+20 Summit in Rio de Janeiro. The choir has taken part in recordings and performances with several international artists, including Mara Abrantes, Suzy Paula, Secret Lie, and Lemm Project.

The art programme was curated and organised by researcher Julia Bentz from FCiências.ID.

In order to contribute to the goal of promoting foresight in CCA and DRR, the knowledge on foresight and its potential applications in DRR and CCA in this PLACARD foresight report was based on two foresight workshops, applying different methods (above text boxes 1 and 2), a webinar and a Conference session as well as contributions to the Munich Re Foundation Summer School in 2018 and the European Conference on Risk Perception, Behaviour, Management and Response in Paris[2] in 2019. In addition, at the 4th ECCA 2019 in Lisbon, PLACARD presented its foresight efforts and a screening of the conference programme showcased that foresight elements are directly and partly indirectly an integral part of CCA and DRR efforts, when looking at approaches, policies, strategies, plans and actions to increase resilience towards current and very often future climate related risks.

4.4. Other experiences and activities using foresight

Several other initiatives have applied foresight activities in developing their work. This section details some examples of relevance for CCA and/or DRR communities.

The potential role of Foresight in National Risk Assessments (NRAs) – OECD experience

The OECD published a cross-country perspectives report on National Risk Assessments in October 2018. This report provides a synthetic view of national risk assessments (NRAs) in twenty OECD Member countries. NRAs are used to support risk management decisions in a rapidly changing global risk landscape characterised by increasingly complex, interconnected societies and highly mobile people, information and goods. The report highlights good governance practices in establishing NRAs and how the results are used

2 Land4Flood: Paris Conference

to inform public policy. It identifies challenges that OECD Member countries continue to confront in their efforts to implement NRA, and makes concrete recommendations where improvements could still be made.

The report concludes that there is an increasing use of all-hazards and threats approach in national risks assessments. Also, national risk assessments increasingly feature forward-looking projections of more than five years. Often national risk assessments are combined with horizon scanning and foresight to build consensus.

Foresight can help reassess government's national risk portfolios and strengthen capabilities to manage critical risks within different time-frames, further improving prevention and preparedness as well as improving risk management strategies.

The report also concludes that there are still some challenges that need to be overcome, namely:

- Foresight has to clearly add value and be of relevance;
- The timeframes are essential;
- The right expertise and information is needed;
- Clear messages need to be provided;
- Multi-stakeholder participation is needed;
- Data remains a challenge.

Through better connecting foresight elements with NRAs, it is helpful to communicate the right issues, avoiding communication along the lines of what policy-makers want to hear; engaging policy-makers throughout the NAS process; ensuring cross-departmental involvement in governance arrangements to enable coordination and oversight as well as establishing top-level leadership and ownership.

Climate change in National Risk Assessments

Member States have shown a small improvement from the national risk assessments provided under the EU Civil Protection Mechanism and submitted in 2015–2016. Nineteen of the 24 reports received from Member States/Participating States took climate change into account. For some Member States it was the first time that climate change impacts were assessed for different risks (e.g. Belgium). Others improved their data or methodologies (e.g. Denmark). Nevertheless, a fifth of Member States and Participating States still did not take into account climate change (five of the reports received).

The picture differs with regards to the sophistication of incorporating climate change impacts in the risk assessment, in particular how climate change influences the likelihood and impact of certain risks and leads to new risks. **Approximately half of the Member States base their analysis on scenarios and projections taken from climate models (regional climate models and downscaled global climate models), allowing for a perspective until 2050 and/or 2100**. All but a few of those used scenarios/projections for all the risks identified as being affected by climate change.

Two Member States (Belgium and Hungary) also presented a comparison of the changing likelihood and impact between now and 2045–2050 of different risks under climate change. Those that did not base their reports on scenarios or projections either made use of existing studies that provide general indications of climate change trends, or assessed the impact qualitatively, based on expert opinions. Nevertheless, the majority of Member States/Participating States involved the relevant ministry or agency responsible for climate change in the description of the risk assessment (through data and knowledge sharing, and/or working groups) and made reference to existing climate risk assessments and climate change adaptation strategies.

In terms of scope of analysis, the picture is also uneven. Most often, climate change is mentioned in relation to weather-related risks. Some Member States, predominantly northern European countries, also analysed climate change impacts on biological or even man-made risks, e.g. vector-borne diseases, invasive alien species, noxious substances, critical infrastructure disruption, industrial accidents or security of food supply (i.e. cascading effects of extreme weather events), or immigration.

DG CLIMA work on the EU Adaptation Strategy

DG CLIMA took up foresight elements in considering the way forward for the EU Adaptation Strategy: its evaluation can be considered as an interactive foresight exercise, looking into collaborative scenario exploration for the EU adaptation policy. Shortly after the evaluation of the EU Adaptation Strategy, the reflection process for possible new/renewed initiatives in EU climate change adaptation policy should take a wide and forward-looking perspective, for which the perspectives and experiences of EU Member States are essential. In a very early stage of this process, the Working Group 6 – Climate Change Adaptation – the Meeting on March, 12, 2019 opened with an interactive foresight exercise centred on EU climate action in general, and adaptation in particular.

Its main purpose was to stimulate upstream out-of-the-box thinking, gauging reactions to non-traditional policy responses, and developing a common understanding of the possible positioning of stakeholders in EU policy-making. The "board game" medium provided a safe space for open discussions without pre-determined positions.

Two distinct scenarios for the future until 2049 were developed to structure the group discussions. These unfolded over time, with intermediate milestones at 5 and 15 years. Both scenarios were framed by megatrends (for example, hyper-connectedness, urbanisation, rise of millennials) and experienced, at each milestone, an extreme weather event whose severity was determined by the roll of a dice.

The scenarios were (in brief):

- **Cooking together** – a future with low climate ambition but strong collaboration among relevant actors;
- **Paris on steroids** – a future where climate ambition is strong, but collaboration levels are low.

The discussions were not meant to be conclusive, or to produce concrete outcomes; instead, they prepared the ground for further exchanges at subsequent meetings of Working Group 6 in view of co-creating the future of the EU adaptation policy.

In addition, the EU long-term strategy – foreseen for early 2020 – will consider adaptation to current and future impacts of climate change as well as the energy transition and climate mitigation. Even more importantly, the success of the energy transition depends on how well it is connected to efforts to address the transition of the broader socio-economic system, a system that must be resilient to climate shocks. On 28 November 2018, the Commission presented its strategic long-term vision for a prosperous, modern, competitive and climate-neutral economy by 2050.

Inevitable Policy Response – role of the financial market

The Inevitable Policy Response (IPR) aims to prepare investors for the associated portfolio risks of likely near-term policy response to climate change. Its rationale is that government action to tackle climate change has so far been highly insufficient to achieve the commitments made under the Paris Agreement, and that the market's default assumption appears to be that no further climate-related policies are likely in the near-term. Yet as the realities of climate change become increasingly apparent, it is inevitable that governments will be forced to act more decisively than they have so far. The IPR project forecasts a response by 2025 that will be forceful, abrupt, and disorderly because of the delay.

In anticipation, the IPR project partners[3] are building a Forecast Policy Scenario which lays out the policies that are likely to be implemented up to 2050, and quantifies the impact of this response on the real economy and financial markets. During 2019 the project is expected to publish detailed modelling of the impact:

- On the macroeconomy;
- On key sectors, regions, and asset classes;
- On the world's most valuable companies.

The forecast is expected to provide investors with a tool for navigating a complex, evolving policy and regulatory landscape – to enhance portfolio resilience and inform strategic asset allocation, by:

- Providing a realistic outline of the coming policy response, and quantifying the financial risks that it presents;
- Rather than working backwards from pre-defined target temperatures, being based on working up from what policy and technology developments are most likely to emerge;
- Focus on a time frame that is relevant to investors;
- Model the interaction between impacts of the macro economy, the energy system and the land use system;
- Provide a granular analysis that breaks down the impact at the regional, sector and – for the first time – asset level.

3 A collaboration between PRI, Vivid Economics and Energy Transition Advisors.

4.5. Characteristics of "effective" foresight methods in CCA and DRR policymaking

The analysis presented suggests that foresight methods can indeed offer a useful way to enhance integration between CCA and DRR in science and policy. It also makes clear that the choice of particular methods depends on the specific type of questions to be addressed, and on the expertise and skills of people involved in their application.

Therefore, generalising "good practice" advice for the use of specific foresight methods may actually prove counterproductive as they seem to perform best after careful case-by-case consideration of formal problem solving and analytical needs.

According to Harper and Pace (2004), foresight is traditionally defined as a tool or a set of tools used to determine how alternative future developments would lead to different outcomes. More recently it has been suggested that foresight should go beyond this notion and evolve to a process whereby tools are just one element, interacting with human inputs (e.g. creativity, intellect, expertise and sector-specific knowledge) to jointly build visions or preferred outcomes.

Sus and Himmrich (2017) emphasise that integrating perspectives of civil society groups and other stakeholders in participatory foresight exercises can lead to greater transparency and a disruption of the undesirable 'tunnel vision' in policymaking processes. Similar advantages are likely to apply to the cooperation between CCA and DRR communities in joint participatory foresight work.

Regarding policy development, three modes of how foresight may be used to influence policies can be described as (Havas et al., 2010):

- **Informing** policy (for example, by sharing visions on the future developed by experts),
- **Advising** policy (for example, merging results from expert-driven foresight with perceptions and goals of policymakers) and
- **Facilitating** policy (for example, developing common visions in a learning environment).

Policy-oriented foresight can influence the strategic policy process and thus serve as a tool for strategic policy-making, but not without a range of challenges (Da Costa et al., 2008). Through functions such as: informing policy; facilitating policy implementation; embedding participation in policy-making; supporting policy definition; reconfiguring the policy system and symbolic purpose, foresight can support policy processes in different phases from agenda setting to deciding on action (Fobé and Brans, 2011).

Based on experiences in Flanders, Fobé and Brans (2011) identified eight elements affecting the capacity of foresight to influence strategic policy-making, namely: (i) involvement of policy-makers; (ii) timing; (iii) facilitation of diffusion; (iv) stakeholder support; (v) time horizon; (vi) quality; (vii) openness of policy-makers; and (viii) absence of advice competition.

On the other hand, in the context of the European Agency for Safety and Health at Work (EU-OSHA) strategic programme 2014–2020, Cox et al. (2015) identified 17 success factors which affect the impact of foresight research on policy:

1. Clarify what the foresight study is seeking to achieve which cannot be achieved by other policy means;
2. Engage appropriate stakeholders through the foresight study and beyond in its implementation;
3. Establish a clear link between foresight and policy agenda;
4. Identify clients/beneficiaries and users of foresight study;
5. Use of expert foresight contractors to sell and explain the benefits of the methods, and assume advisory role to policymakers on foresight use;
6. Embed client representation on the foresight research team;
7. Ensure policy engagement by achieving relevant focus;
8. Ensure political and policy ownership;
9. Education of clients and participants;
10. Project management: frequent communication to keep project on track;
11. Measuring impacts to increase perceived value;
12. Incorporating range of appropriate disciplines in the foresight study;
13. Managing expectations;
14. Communication and engagement: produce high-quality outputs that can engage with different stakeholder groups/audiences;
15. Ensure balance between breadth of topic coverage and depth analysis;
16. Deploy foresight methods appropriately – the value added of foresight approaches;
17. Adaptation and flexibility as client's goals change and the involvement of different actors can alter over the course of a project.

Despite the above mentioned caveats, a number of common characteristics for successful and effective use of foresight methods for the integration of CCA and DRR, can be put forward[4]:

- **Balanced and equitable engagement of stakeholders** from relevant communities, involving policy, practice, citizens, companies, and scientists in a transdisciplinary and participatory approach with adequate attention to key issues such as trust building and ownership;

4 These were formulated based on a session at the 3rd European Climate Change Adaptation Conference (ECCA) held in Glasgow in June 2017 (see Annex II).

- **Common "intermediate" time and spatial scales**, pushing DRR practitioners to think more about the future and larger time scales, and CCA practitioners to present their insights for shorter time and spatial scales than they are used to (or feel comfortable with because of increasing uncertainties of climate projections);
- **Harmonised set of definitions for key terms, drivers, exposed values**, or at least mutual understanding of how the different communities interpret and use particular terms – language used should be understandable for everyone involved;
- **Selection of method(s) and tool(s) tailored to the objectives of the exercise**, avoiding one-size-fits-all approaches applied to all topics;
- **Common outputs** geared towards the interests of all communities involved;
- **Focus on positive concept and outcomes***:* even if risk assessment can be part of the foresight exercise, moving towards joint positive solutions (e.g. framed from a resilience or wellbeing perspective) motivates people;
- **Combination of quantitative and qualitative methods** can enhance richness of discussions and facilitate creative engagement of participants;
- **Equal attention to climate/environmental and socio-economic factors at relevant scales,** to account for the importance of social, cultural, institutional and economic factors for vulnerability at the local level;
- **Good facilitation to guide the work and manage the process**, because foresight is about people and their interactions, not only about technical or scientific aspects.

5. Future opportunities on using foresight to enhance CCA and DRR cooperation and integration

In the context of the desired coordination of CCA and DRR policies and practices, the procedural aspect of foresight is potentially where the greatest benefit for integrated solutions can be found. This includes the engagement of policymakers and a range of different stakeholders, the adjustment of the foresight exercises to the timelines of the CCA and DRR policy processes, and the recognition of challenges of communication and facilitation, as well as competitive insights.

In addition, in order to have the greatest and most long-lasting impact on policy development and fostering of connections between CCA and DRR, foresight should take into account issues such as quality of the exercise and reconciliation of different time horizons. The results from the work presented in this report led to the identification of several opportunities where the use of foresight may help to integrate CCA and DRR across Europe. Three specific policy areas were identified:

- **Follow up of the evaluation and possible revision of the EU Adaptation Strategy**. The current evaluation mainly considers to what extent the objectives of the strategy are being met in Europe and its Member States. It is not clear how futures analyses will inform the evaluation and thereafter a possible revision of the Strategy, for example, if this would go beyond considering the results of scenario analysis with physical and economic models from the JRC PESETA project. A foresight exercise including but not limited to the modelling analyses could inform the next steps of the Strategy renewal or revision. Also, Climate Adaptation Strategies and Action Plans on the national or sub-national level can be enriched with foresight elements, ensuring a better integration of CCA and DRR. Since Monitoring and Evaluation Systems are being developed or implemented (EEA Technical Report No 20/2015, OECD, Paper No. 2017 (3), Mäkinen K. et al., 2018[5]), elements of foresight can have added value in the revision of these Strategies and Action Plans.

5 Kirsi Mäkinen, Andrea Prutsch, Eleni Karali, Markus Leitner, Sonja Völler, Jari Lyytimäki, Patrick Pringle, Wouter Vanneuville (2018) "Indicators for adaptation to climate change at national level – Lessons from emerging practice in Europe". European Topic Centre on Climate Change impacts, Vulnerability and Adaptation (ETC/CCA) Technical paper 2018/3. doi: 10.25424/CMCC/CLIMATE_CHANGE_ADAPTATION_INDICATORS_2018.

- **Development and implementation of the EU Civil Protection Mechanism** (UCPM)6. Further development and implementation of the EU Civil Protection Mechanism in the context of the Sendai Framework and Paris Agreement can benefit from more systematic and regular foresight exercises that would enhance the emphasis on preventive measures7 and consideration of long-term impacts of climate change. One entry point can be the revision of the National Risk Assessment (NRA) which is prepared by all participating parties across Europe (all 28 EU Member States and in addition Iceland, Montenegro, Norway, Serbia, the former Yugoslav Republic of Macedonia, and Turkey). The latest submission of these NRAs was in 20188, based on the UCPM Decision No 1313/2013/EU of the European Parliament and of the Council on a Union Civil Protection Mechanism. In addition, the "Action Plan on the Sendai Framework for Disaster Risk Reduction 2015–2030: A disaster risk-informed approach for all EU policies (EC, SWD (2016, 205 final/2) foresees a critical area being building risk knowledge into all EU policies the "use of foresight, scenarios and risk assessments for better preparedness to existing, emerging risks and new types of risks".
- **Shaping EU research and Innovation policy including development of the 9th Framework Programme "Horizon Europe"**. Discussions have begun on the follow-up to H2020 where foresight is likely to play an important role in the process. Since Horizon Europe considers scientific evidence and foresight in reforming and enhancing the European Research and Innovation system, foresight should become an integral part of research and innovation, and become well reflected in research programmes as well as in the future funded projects. A specific exercise could explore the connections between CCA and DRR as a transversal theme across different societal challenges, including, but not limited to, climate action and secure societies. Such an exercise can build on the work of earlier projects such as BOHEMIA (Beyond the Horizon – Foresight in Support of the Preparation of the EU's Future Policy in Research and Innovation). In order to plan Horizon Europe the EC announced 5 Mission Boards and their members, including the Mission Board for Adaptation to Climate Change, including Societal Transformation. The PLACARD team includes two Board members on the Mission for Adaptation to Climate Change, and could thus help to facilitate such an exercise if included in the Mission scope.

6 Decision No 1313/2013/EU of the European Parliament and of the Council of 17 December 2013 on a Union Civil Protection Mechanism, OJ L 347, 20.12.2013, p. 924.

7 According to EC (2017) "Increasing awareness, including through research and foresight, of a changing risk landscape sheds light on new and emerging risks that could be more of a focus in NRAs". In relation to Priority Area I of the Sendai Framework (Understanding Risk), a majority of respondents to a survey in the context of the mid-term review of the Civil Protection Mechanism thought that "there is a need for significant increase or increase of support to the use of foresight, scenarios and risk assessments for better preparedness to existing, emerging risks and new types of risks" (ICF, 2017).

8 Based on Article 6 of the UCPM decision, Participating States submitted summaries of NRAs by 22 December 2015, and will do so every three years thereafter.

- **European Green Deal (EC, 2019, COM(2019) 640 final)**. A new, more ambitious EU strategy on adaptation to climate change is needed and essential, as climate change will continue to create significant stress in Europe in spite of the mitigation efforts. Strengthening the efforts on climate-proofing, resilience building, prevention and preparedness is crucial. Work on climate adaptation should continue to influence public and private investments, including on nature-based solutions. It will be important to ensure that across the EU, investors, insurers, businesses, cities and citizens are able to access data and to develop instruments to integrate climate change into their risk management practices. In addition, climate and environmental risks will be managed and integrated into the financial system. This means better integrating such risks into the EU prudential framework and assessing the suitability of the existing capital requirements for green assets.

6. Reflections and conclusions

6.1. Reflections

This report demonstrates that foresight methodologies are already being applied in multiple fields of CCA and DRR research, policy and practice, albeit not always explicitly called "foresight". Interest in, and awareness of "foresight" appears to be growing and more methods are beginning to be applied.

Additionally, participants in PLACARD activities (see annexes I – IV) have confirmed that the use of foresight methods can go beyond the current support to CCA and DRR research, policy and practice, and promote better connections and integration across the two communities. For example, foresight methods going beyond quantitative scenarios and modelling may have the potential to increase the effectiveness and relevance of future-thinking work in a joint CCA-DRR policy context.

Several factors support this rationale, and suggest that effective foresight may:

- Enhance the effectiveness of participatory processes, cooperation and dialogue;
- Produce salient knowledge and capacity building that is relevant for future decision-making and policy support;
- Facilitate the understanding of issues and concepts such as complexity, uncertainty, non-linearity, wildcards and surprises;
- Generate levers that build flexibility into policy measures and across policy areas;
- Address different time scales simultaneously (e.g., connect long-term CCA/prevention with short-term DRR/preparedness);
- Be used in the context of trust building and the development of shared values;
- Allow for the use of a holistic perspective in connecting different policy areas.

However, and in order to successfully apply foresight methods, several challenges have to be taken into consideration, thus deserving further thought:

- Each situation is different and requires specific knowledge input: there is no single "best practice" or "scientifically proven" approach to foresight;
- Foresight is a learning process for all participating actors, making it demanding and

difficult even if the stakes are well known;

- People are vital: any foresight activity should address ownership by the participants and move beyond scientific/technical considerations, as often "perception is considered as reality" for many involved in making decisions;
- Foresight activities should consider both products and processes;
- Participation should extend beyond the scientific and policy community, engaging a broad range of societal actors, including youth (it is about their future) and artists (mobilising their creativity to imagine novel risks and unconventional solutions);
- Foresight does not necessarily lead to quick, direct and easy results so expectations should be moderated;
- Foresight exercises should not adhere to a strictly controlled process but rather retain flexibility;
- Recommendations resulting from foresight exercises are not expected to be automatically implemented, and should not necessarily be seen as directly leading to priority setting.

6.2. Conclusions

Our work on foresight confirmed the hypothesis that foresight methods and their practical application can be a useful tool to support decision-making in CCA and DRR, but that its implementation in Europe can be extended and further improved.

Based on the work report findings and the outcomes of PLACARD foresight-promotion activities, the following conclusions can be drawn:

- Foresight methods can provide valuable support and a better understanding of the needs and barriers regarding the integration of the "future" dimension in current decision-making, thus leading to more long-term thinking in both CCA and DRR policy and practice;
- There is an identified need to bring the two communities (DRR and CCA) together in concrete activities with clearly defined goals, in order to test, apply and check if foresight methods are able to provide the required (salient) outputs for both policy and practice;
- Foresight activities should promote a clear understanding of the differences and similarities in perspectives and expectations across communities, including the different views CCA and DRR practitioners may have on similar situations and issues;
- Specific opportunities for connecting CCA and DRR through foresight should be sought, for example, through research programming and projects, engaging a broad set of people beyond scientists and policymakers;
- Future research should aim to improve capacity building regarding the integration of DRR and CCA, for example, by exploring issues around how CCA actors can benefit from a clearer understanding of the importance of DRR focusing on extreme climate events, while DRR communities may benefit from incorporation adaptive and long-term perspectives, when focusing on disaster prevention.

7. References

Aubrecht C., Freire S., Fröhlich J., Rath B., Steinnocher K. (2011): Integrating the Concepts of Foresight and Prediction for improved Disaster Risk Management. Proceedings of the 8th International ISCRAM Conference – Lisbon, Portugal, May 2011

Bentz, J and O'Brien, K. 2019 (in press). Art for change: Transformative learning and youth empowerment in a changing climate. *Elementa Science of the Anthropocene*. doi: 10.1525/elementa.390

Cosgrave, E., & Kelman, I. (2017). Performing Arts for Disaster Risk Reduction Including Climate Change Adaptation.

Costa, O. da, Warnke P., Cagnin C. and Scapolo F. (2008): The Impact of Foresight on Policy-Making: Insights from the FORLEARN Mutual Learning Process. *Technology Analysis and Strategic Management*, **20** (3).

Cox, A., S. Swift and M. Rhisiart (2015): Success factors for achieving policy impact in foresight studies. European Risk Observatory, European Agency for Safety and Health at Work.

EC (2019). The European Green Deal. Communication from the Commission to the European Parliament, the European Council, the Council, the European Economic and Social Committee and the Committee of the Regions. Brussels, 11.12.2019.

EC (2013): Decision No 1313/2013/EU of the European Parliament and of the Council on a Union Civil Protection Mechanism of 17 December 2013.

EC (2015): The Knowledge Future: Intelligent policy choices for Europe 2050. Report by an expert group on Foresight on Key Long-term Transformations of European systems: Research, Innovation and Higher Education (KT2050).

EC (2016): Commission Staff Working Document – Action Plan on the Sendai Framework for Disaster Risk Reduction 2015-2030 – A disaster risk-informed approach for all EU policies, EC, SWD (2016, 205 final/2, Brussels, 17.6.2016.

EC (2017): White Paper on the Future of Europe – Reflections and scenarios for the EU27 by 2025. COM(2017), Brussels.

EC (2017): Commission Staff Working Document – Overview of natural and man-made disaster risks the European Union may face – SWD(2017) 176 final, Brussels, 23.5.2017.

EEA (2017): Climate change, impacts and vulnerabilities in Europe 2016.

EEA (2015): National monitoring, reporting and evaluation of climate change adaptation in Europe EEA, EEA Technical report No 20/2015.

Fobé, E. and M. Brans (2011): Public Management Institute Policy-oriented foresight as a tool for strategic policy-making. An assessment of opportunities and difficulties. Paper presented at the 33rd EGPA Annual Conference in Bucharest, Romania, 7–10 September 2011.

Gabrys, J., & Yusoff, K. (2012). Arts, sciences and climate change: practices and politics at the threshold. *Science as Culture*, **21**(1): 1–24.

Galafassi, D., Tàbara, J. D., & Heras, M. (2018). Restoring our senses, restoring the Earth. Fostering imaginative capacities through the arts for envisioning climate transformations. *Elementa Science of the Anthropocene*, **6**(1): 69.

Haegeman, K., M. Spiesberger, and T. Könnölä (2017): Evaluating foresight in transnational research programming. *Technological Forecasting and Social Change*, **115**, February 2017: 313–326.

Harper, J.C. and G. J. Pace (2004): Creative processes in policymaking: a case for context in foresight. De Bono Creativity Conference.

Havas, A., D. Schartinger and M. Weber (2010): The impact of foresight on innovation policy-making: recent experiences and future perspectives. *Research Evaluation*, **19**(2): 91–104. doi: 10.3152/095820210X510133

Heras, M., Tabara, J. D., & Meza, A. (2016). Performing biospheric futures with younger generations: A case in the MAB Reserve of La Sepultura, Mexico. *Ecology and Society*, **21**(2).

Hov et al. (2013): Extreme Weather Events in Europe: preparing for climate change adaptation. Produced by the Norwegian Meteorological Institute in cooperation with the European academies Science Advisory Council.

ICF (2017): Interim evaluation of the Union Civil Protection Mechanism, 2014-2016. Final Report. Brussels.

JRC (2001): FOREN – Foresight for Regional Development Network, A Practical Guide to Regional Foresight, Edited by JRC-IPTS, December 2001.

JRC (2008): The FOR-LEARN Online Foresight Guide. Accessed 12 December 2019.

Kirsi Mäkinen, Andrea Prutsch, Eleni Karali, Markus Leitner, Sonja Völler, Jari Lyytimäki, Patrick Pringle, Wouter Vanneuville (2018). Indicators for adaptation to climate change at national level – Lessons from emerging practice in Europe. European Topic Centre on Climate Change impacts, Vulnerability and Adaptation.

Martin, B. (1995): Foresight in Science & Technology. *Technology Analysis & Strategic Management*, **7**: 139–168.

Milkoreit, M. (2016). 10 The promise of climate fiction. In *Reimagining Climate Change (p. 171)*.

Milkoreit, M. (2017). Imaginary politics: Climate change and making the future. *Elementa Science of the Anthroposcene*, **5**(62).

Nikoleris, A., Stripple, J., & Tenngart, P. (2017). Narrating climate futures: Shared socioeconomic pathways and literary fiction. *Climatic Change*, **143** (3–4), 307–319.

OECD (2017): Climate Change Expert Group, Paper No.2017(3): Insights from national adaptation monitoring and evaluation systems, May 2017.

Popper, R. (2008): How are foresight methods selected? *Foresight*, **10** (6): 62–89.

Randall, R. (2009). Loss and climate change: the cost of parallel narratives. *Ecopsychology*, **1**(3): 118–129.

Ricci, A., C. Sessa, M. Weber, P. Schaper-Rinkel, S. Giesecke and R. Hudson (2017): New Horizons: Future Scenarios for Research & Innovation Policies in Europe – A report from project BOHEMIA – Beyond the Horizon: Foresight in Support of the Preparation of the European Union's Future Policies in Research and Innovation

Shrivastava, P., Ivanaj, V., & Ivanaj, S. (2012). Sustainable development and the arts. *International Journal of Technology Management*, **60**(1/2): 23.

Sus, M. and J. Himmrich (2017): the impact of foresight on policymaking. Towards more transparency and participation. G20 Insight Working Paper, Germany

Tyszczuk, R., & Smith, J. (2018). Culture and climate change scenarios: The role and potential of the arts and humanities in responding to the '1.5 degrees target.' *Current Opinion in Environmental Sustainability*, **31**: 56–64.

UK Government Office for Science (2012): Reducing risks of future disasters – priorities for decision-makers. Final Project Report.

Annex I – PLACARD Foresight Workshop

Reducing vulnerability to climate-related hazards, Vienna, 24.-25. October 2016

The first PLACARD Workshop aimed at applying foresight can strengthen both CCA and DRR in terms of science, policy and practice; link them with other international mechanisms such as the Sustainable Development Goals (SDGs); and explore the implications of the global agreements for European, national and local action.

With the Foresight workshop, PLACARD aimed to:

- explore the potential role of foresight methods, tools and processes to inform the implementation of the UNFCCC adaptation and Sendai disaster risk reduction mechanisms;
- identify relevant long-term trends (e.g. global mega-trends) and surprise events (wildcards) and other developments which would have implications for DRR and CCA; and
- explore the needs and priorities of connecting climate change, disaster risk response, sustainable development and other communities with respect to foresight.

Background information on megatrends and its implication on CCA and DRR was developed before the workshop and made available to all participants. **The key findings of the workshop were summarised in a Policy Brief and key results are showcased below**:

What are the barriers to using foresight in CCA and DRR?

- DRR is participatory and mainly based in the past and present: CCA is forward-looking, but uses methods dominated by quantitative scenario analysis and gradual change with limited relevance for local action.
- Summaries of foresight methods exist, but case-studies where foresight is applied to CCA or DRR are not widely available.
- The European foresight platform that could have been useful is no longer active.

How could foresight support CCA and DRR?

- CCA and DRR both emphasise the importance of participatory approaches in engaging different actors at different levels and sectors – the broad menu of qualitative and quantitative foresight methods offers opportunities to help with these activities.
- CCA increasingly focuses attention on changes in weather extremes, while DRR addresses longer-term concerns in enhancing resilience – a multi-method foresight approach using tools such as analysis of megatrends, wildcards and disruptors will add to the scenario approach common in climate change analysis.
- Foresight tools can help to encourage strategic thinking and prioritisation. The goal of a foresight exercise for CCA and / or DRR should be clearly defined.
- A foresight toolbox has multiple purposes, so the choice of methods should be open-minded and focused on the specific target, objective and time-horizon of a particular problem. The range of methods includes foresight-specific options as well as cross-disciplinary – several can be combined.

How can we make better use of foresight in CCA and DRR?

- Support a better understanding of the needs and barriers to the **integration of the "future" dimension in current decision-making** – more long-term thinking in policy and practice and identifying emerging issues.
- **Understand the differences and similarities** in perspectives and expectations between CCA, DRR and foresight.
- **Bring the two communities together** in concrete activities with a clearly defined goal and apply foresight methods.
- **Develop concrete and achievable outputs from foresight thinking**, defining framing and context. For example, clear trends, quantitative outputs, sets of scenarios and narratives, to smooth integration within CCA and DRR activities.
- **Understand people's perceptions and if needed, try to change them** – for example, researchers, practitioners, decision-makers and NGOs. CCA and DRR practitioners can have different views on the same issues.
- **Identify specific opportunities** for connecting CCA and DRR, for example through research programming and projects.
- **Conduct research and improve capacity building** to integrate DRR and CCA. CCA actors could benefit from a clearer understanding of the importance of a DRR or extreme event focus, while DRR practitioners may benefit from grasping the relevance of a long-term climate change perspective for prevention.
- **Define research questions and time-horizons** early in the project planning or proposal stage to select and apply the most suitable foresight methods and deliver knowledge, for example, research needs, future visions and action plans.

- **Promote and communicate foresight examples** – good practice on different levels, contexts and settings. For example, forward-looking co-operation to implement measures with appropriate institutions, authorities and stakeholders.
- **Provide evidence** of the immediate benefits of foresight – and the risks of not using it!
- **Design appropriate foresight processes** that scope the problems at hand, explore scenarios, develop a vision, back-cast, evaluate learning and iteration, and then carry out a series of practical foresight exercises at different levels to see how they work. Do it – don't just talk about it!
- **Apply foresight methods to existing practices**. Foresight methods are already partly used in adaptation pathways, climate scenarios, impact and vulnerability assessments, and in development of climate change adaptation and disaster risk reduction strategies and action plans.
- **Avoid ivory-tower research**, which is unattractive at a regional or local authority level where decisions are made.

Annex II – PLACARD Foresight Experience

Session at 3rd European Climate Change Adaptation (ECCA) Conference, Glasgow, 6.-9. June 2017

Session title

Can foresight help integrating Climate Change Adaptation and Disaster Risk Reduction?

Rationale

How can foresight help to reduce vulnerability to climate-related hazards? In 2015, the Paris Agreement at COP21 on climate change, notably climate change adaptation (CCA) and the Sendai Framework for Disaster Risk Reduction (DRR) formed major steps towards increasing resilience to climate-related extreme events. Long-term risk and response analyses in support of these agreements and the IPCC assessments tend to be dominated by the formal analysis of quantitative scenarios of greenhouse gas emissions and concentrations. While such analyses are an important mechanism to advance analytical knowledge about future risks, an earlier workshop in Vienna suggested that they may constrain creative analysis and there could be a complementary role for other, e.g. more qualitative foresight methods implemented by diverse experts and stakeholders to explore future risks and opportunities. Such foresight could strengthen both climate change adaptation and disaster risk reduction in terms of science, policy and practice, and also link with other international mechanisms such as the Sustainable Development Goals (SDGs) and explore the implications of the global agreements for European, national and local action.

Objectives

In this context, the H2020 Coordination and Support Action PLACARD organised a conference session to:

- Explore the potential role of foresight methods, tools and processes to inform the implementation of the UNFCCC adaptation and Sendai disaster risk reduction mechanisms;
- Identify relevant long-term trends (global mega-trends) and surprise events and

developments which would have implications for DRR and CCA

- Explore the needs and priorities of connecting CCA, DRR, SDGs and other communities with respect to foresight.

Programme

The session was attended by about 40 participants from science, policy and practice. After an introductory presentation about foresight (Rob Swart, Wageningen Environmental Research), the session started with two plenary presentations about the role of foresight in DRR and CCA: the implications of megatrends and wildcards for climate change adaptation and disaster risk management (Guillaume Rohat, University of Geneva) and the potential role of foresight in supporting policy development in practice, notably for Environmental Impact Assessment (Markus Leitner, Environment Agency Austria). The session then moved to a world café setting (facilitated by Tiago Capela Lourenço, Lisbon University), which addressed two main questions:

- Can you provide other examples where foresight was used in the context of CCA and DRR (in particular regarding the application of common methods/tools)?
- What are the main characteristics of 'good' foresight exercises that can help integrate CCA and DRR (what, for whom, why)?

The session was ended by a plenary wrap-up session (chaired by Markus Leitner).

Results: foresight experiences

Before discussing foresight experiences in CCA and DRR, the vast majority of participants agreed that foresight methods such as the ones presented in the presentation are useful for both CCA and DRR research and practice. Several participants were unfamiliar with the term foresight, but did in fact have experience with some of the (foresight) methods included, such as scenario analysis, backcasting or development of visions. The assumption of the organisers that quantitative methods would be less common in DRR practice than in CCA proved to be incorrect, but the type of quantitative analysis differs: time horizons considered in CCA are longer than for DRR, which focuses more on the present risks and past (statistics of weather extremes) experiences.

Foresight exercises in which intermediate time horizons (some decades at most) or solutions that are useful from both perspectives (e.g., nature-based solutions) are applied offer the largest potential for CCA and DRR integration. Qualitative approaches were less well-known, but were seen as having potential to facilitate active participation of stakeholders with lower skills in interpreting quantitative information.

Participants provided examples where foresight methods are used in CCA and DRR (other than model-based scenario analysis). Among these were: foresight for London´s adaptation strategy, backcasting by the Stockholm Environment Institute for the SDG strategy, a combination of methods and time scales in the Transformation and Resilience on Urban Coasts (TRUC) project, participatory risk mapping for Danish coastal areas and flood risk management plans, environmental impact assessment in Austria, social innovation and

nature-based solutions (EKLIPSE). The ERA4CS (ERA for Climate Services) was mentioned as an opportunity for creating a common vision for climate services for CCA and DRR.

In addition to the past and current examples above, the participants suggested several opportunities to apply foresight methods combining CCA and DRR, such as development of joint visions or scenarios on climate-resilient cities and municipalities with stakeholders, possibly accompanied by backcasting of possible pathways towards desirable end points.

Results: characteristics of "good" foresight methods in CCA and DRR context

Before starting a discussion on characteristics of "good" foresight methods, the participants were asked if a 'good' foresight exercise (in CCA/DRR) needs to combine multiple methods. There was strong disagreement amongst them about this question, with some emphasising the complementarity of different methods (different methods providing equally useful complementary insights) and others emphasising the feasibility and effectiveness (multiple methods requiring more time and resources and can provide complex or even conflicting results). The suggested characteristics of "good" foresight methods in CCA and DRR included:

- **Balanced and equitable participation of stakeholders** from relevant communities, involving policy, practice, citizens, companies, and scientists in a transdisciplinary and participatory approach with adequate attention to key issues such as trust building and ownership.
- **Common "intermediate" time and spatial scales**, pushing DRR people to think more about the future and larger time scales, and CCA people to present their insights for shorter time and spatial scales than they are used to (or feel comfortable with because of increasing uncertainties of climate projections).
- **Harmonised set of definitions for key terms, drivers, exposed values**, or at least mutual understanding of how the different communities interpret and use particular terms – language used should be understandable for everyone involved.
- **Selection of method(s) and tool(s) tailored to the objectives of the exercise**, avoiding one-size-fits-all approaches applied to all topics.
- **Common outputs** geared towards the interests of all communities involved.
- **Focus on positive concept and outcomes**: even if risk assessment can be part of the foresight exercise, moving towards joint positive solutions (e.g., framed from a resilience or wellbeing perspective) motivates people.
- **Combination of quantitative and qualitative methods** can enhance richness of discussions and facilitate creative engagement of participants.
- **Equal attention to climate/environmental and socio-economic factors at relevant scales**, to account for the importance of social, cultural, institutional and economic factors for vulnerability at the local level.

Wrap-up and follow-up

In the final plenary wrap-up session, the conclusions from the world café session were very briefly reviewed with an eye upon the potential follow-up. Foresight was confirmed to be a useful tool to support decision-making for climate change adaptation and disaster risk management, but the implementation in Europe can be improved, better organised and sustained, involving relevant institutions and networks. A webinar on foresight in CCA and DRR is planned in the fall of 2017, followed by a 2nd Foresight Workshop on methods, tools and good practices in CCA/DRR in 2018, and a foresight session will be included at the 4th ECCA conference in Lisbon in 2019.

Annex III – PLACARD Foresight Webinar

Exploring the use of foresight methods in climate resilience, 30 May, 2018

The topic of the PLACARD webinar was the exploration of the use of foresight methods in climate resilience. The webinar was based on the potential of foresight methods in increasing climate resilience across Europe, in the light of Juncker's 5 Futures for Europe.

The following presentations were provided:

- Introduction and PLACARD foresight activities – Rob Swart, Wageningen Environmental Research
- The 5 futures of Europe and the future of climate action: Reflections and scenarios for the EU27 – Jonathan Gaventa, Director, E3G Brussels Office
- Potential future climate in terms of climatic hazards and impacts expected for Europe – Ian Holman, Cranfield University

The webinar discussions supported the development of a broader workshop on forward-looking (foresight) activities in late 2019: foresight methods will be used to support the three policy-science instruments, and design pathways of how they would play out in a world that 'mixes' Juncker's 5 futures with different climate scenarios.

Annex IV – PLACARD Foresight Workshop

Facing the future of Europe's climate, 11-12 December, 2018

The second PLACARD Foresight workshop showcased the potential of foresight methods in increasing climate resilience across Europe.

During the workshop, participants explored how Juncker's 5 futures of Europe can be used to assess climate and DRR risks in Europe, and to design and characterise effective response strategies for three specific impacts: heat and drought, fluvial flooding, and coastal impacts.

Workshop aim

Previous discussions about the future of the EU have underestimated the risks posed by climate change to the stability and sustainable growth of the EU. By applying foresight methods, the PLACARD foresight workshop explored how Juncker's 5 futures of Europe can be used for assessing climate and disaster risks in Europe, and for designing and characterising effective response strategies, for three cases: heat and drought, fluvial flooding, coastal impacts. The PLACARD workshop was held in December 2018, in Brussels.

Workshop agenda

The workshop focused on three of the Juncker scenarios (Scenario 2: Nothing but the Single Market; Scenario 3: Those who want more do more and Scenario 5: Doing much more together). In addition, three case studies were provided as more concrete examples to work with: Case 1: Heat and drought – heat, hardship and horrible harvests; Case 2: Floods – Paris, Hamburg and Prague are mopping up, but more floods to come; Case 3: Coastal impacts – storm surges along the European coasts cause loss of life and damage. This was followed by an exercise to identify the upsides and downsides of the scenarios for climate change adaptation (CCA) and disaster risk reduction (DRR) for each case study.

As a next step, the challenges for vulnerability (risk) and resilience (response) for each scenario were explored, followed by a joint exercise to identify the actions needed to be taken to avoid challenges and seize opportunities for CCA and DRR. Finally, the findings of the previous exercises were translated into CCA and DRR policies and practice in Europe,

including ways to put the outcomes into practice.

Workshop summary

This summary originates from a workshop on the future of climate change adaptation and disaster risk reduction in the context of the Future of Europe scenarios. In this workshop, foresight methods were used to explore possible futures for Europe and the consequences of dealing with climate change and disaster risks. This required reflections on Europe's long-term climate risks and policy objectives, the international context, and the integration of climate into economic, social and financial policies.

European leaders and the European Commission have kicked off a debate on the Future of Europe to consider the Union's future focus, governance and operations. It is a time for innovation of EU governance more broadly, as well as for the governance of climate risks and responses.

Arguably, the EU has achieved considerable progress on climate change. EU GHG emissions have fallen by 23% since 1990, while GDP has more than doubled in that time. The Paris Agreement was a victory for EU diplomacy and an important step towards limiting global emissions. Member States have agreed on ambitious goals and have submitted Nationally Determined Contributions (NDCs) to try and reach these goals.

The EU's efforts to deal with climate change suffer from the same challenges facing the European project as a whole. Member States face serious difficulties implementing the agreed targets, and in several countries, populist movements question the EU goals. At the same time, Europe depends on international action for climate security, but represents a declining share of global emissions and economic output. NDCs are voluntary so there is no recourse if the goals are not met: Member States not only have to step up their climate mitigation actions, but also prepare for the potential impacts of high-end climate change in case the Paris Agreement aim of keeping temperature increase to 1.5-2ºC is not met.

The radical changes in economic structures and technologies associated with what has been called the 4th industrial revolution blur the lines between the physical, digital, and biological spheres, offering new opportunities. However, they also present real transitional challenges for the workers and communities affected. Migration and security issues – exacerbated by climate impacts – increasingly dominate European politics.

Meanwhile, the context for what European climate governance must deliver is also changing. The White Paper on the Future of Europe provides broad sketches of very different political, economic and institutional directions in which the EU may move, but only addresses climate change in the margin. However, the EU must get to grips with the need to rapidly realise a fundamental transition to a fully decarbonised economy within decades, as required by the Paris Agreement. And because the success of the Agreement depends on governmental decisions in individual countries, implementation is very uncertain. An effective regime to manage increasing and unequally distributed climate risks needs to be developed, that aligns governmental efforts with those of non-state actors such as cities and businesses.

High ambitions for changing the energy system and responding to rapidly increasing climate risks pose a key test for European governance: if the direction of travel emerging from the Future of Europe process does not work for Europe's energy transition and climate risk management, the European project will have failed to meet one of the continent's biggest societal challenges. Over the longer term, Europe's security and prosperity depend on successful adaptation to climate change and a speedy but orderly transition to a decarbonised economy. As to the latter, an earlier report considered reaching mitigation targets for different futures of Europe – the Climate futures report – but does not yet consider climate change adaptation and disaster risk reduction. This was the aim of this Foresight workshop and the focus of this summary.

Foresight promotion report for policy & decision-makers

Markus Leitner, Julia Bentz, Tiago Capela Lourenco, Rob Swart, Ingrid Coninx, Karin Allenbach & Guillaume Thibaut Rohat

PLACARD Work Package 4 – Institutional strengthening,
Task 4.3 – Promote Foresight activities

December 2019

www.placard-network.eu

PLACARD interchange – PLAtform for Climate Adaptation and Risk reDuction – is a hub for dialogue, knowledge exchange and collaboration between the climate change adaptation (CCA) and disaster risk reduction (DRR) communities. Funded by the European Union's Horizon 2020 Research & Innovation Framework Programme. Grant agreement No. 653255

@PLACARD_EU