

Deliverable 1.3

Relevant excerpts from interviews and protocols

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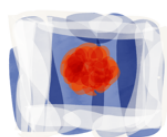


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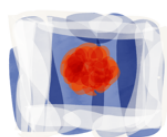
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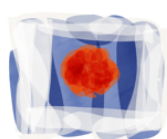


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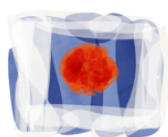
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1 Executive summary/summary

1.1 General overview

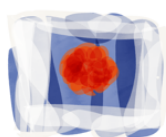
How can scientific climate knowledge be transformed into locally meaningful knowledge? CoCliServ explores new ways in climate communication and shifts the focus on narratives in order to co-develop new forms of climate services for action. Narratives of change provide local knowledge, they facilitate decision-making, and they help identifying information needs and addressing local communities' concerns, aspirations and goals.

Narratives add value and meaning to scientific data about climate change and turn 'matters of fact' into 'matters of concern'. Based on the mapping, analysis and interpretation of narratives of change, CoCliServ develops vision-based scenarios, deploying an incremental and community-led strategy. Exemplary collaborative relationships between climate science and local communities will be established in five representative case-studies: in Bergen / Norway; in the Jade Bay area in Lower Saxony / Germany; in Dordrecht / Netherlands; in St. Pierre / Kerourien and in the Golf du Morbihan in France.

1.2 Goal / purpose and framework of the document

In this report, we present the results of D1.3. After the mapping of narratives in D1.1. (Krauß et al., 2018 a) and the chronology and in-depth analysis of weather-related local narratives in D1.2 (Krauß et al. 2018 b), in this deliverable we document and analyse place-specific excerpts of interviews and protocols. These excerpts serve to outline a corpus of narratives for the co-development of climate services for action. This choice of narratives serves to frame and to provide content for scenario building (WP2) and climate services (WP3), and is in some cases in alignment with (prospective or already active) citizen scientists and artists.

The goal is to present selected narratives of change based on interview and protocol excerpts in order to



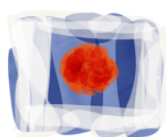
- characterise place-specific conflict or problem constellations
- identify the issues at stake and the relevant actors involved
- outline desired futures on this basis

In doing so, D 1.3 seeks to provide the link between the work packages 1 and 2 as a basis for the co-development of climate services for action.

1.3 Main findings

The reports of the case studies demonstrate that there is no uniform approach to the co-development of climate services for action. While the scientific definition of climate change as for example outlined in the IPCC is widely shared, D1.3 shows that there is a great variety in the settings, the issues at stake, in the goals to achieve, and in the ways to get there. In each of the case studies, CoCliServ researchers have to situate themselves and their project in the context of already existing national, regional and municipal climate change activities. Furthermore, they have to apply methods of their choice. CoCliServ reflects the interdisciplinary nature of climate research. While all the narrative projects are based in social and / or cultural science research, a range of methods was used. Based on the disciplinary background, the individual approach was either more analytical or more interpretative, more deductive or more inductive. In any case, each study is based on an intimate knowledge of the area. It is difficult to compare the methodological approaches in such diverse environments; it takes methodological creativity to work together with environmental NGOs (Golfe du Morbihan), with migrants and a theatre group (Brest), with interested citizens which are normally not part of the decision-making process (Dordrecht, Bergen) or with diverse regional actors (Jade Bay). While methodological creativity is key to bringing together local actors and researchers, the process of scenario-building will probably allow further comparison.

The material presented in this deliverable consists of samples of semi-structured or open interviews, as well as fieldnotes from participant observation; the material is presented in direct quotes, as excerpts or as summaries. The collected narratives – statements, stories, opinions or considerations – prove to be dialogic and qualitative

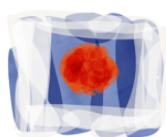


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in nature. The results reveal existing tensions and conflicts; they add to already existing adaptation strategies, extend the range of peers or stakeholders, and shift focus on often-neglected issues like identity, class, belonging, and other 'soft' factors.

In the Dordrecht case, CoCliServ collaborates with the Municipality in making Dordrecht climate proof and adds additional voices from a specific neighbourhood: What insights do local narratives in Dordrecht offer to develop a resilient and desirable future under the influence of climate change? How do these narratives about resilience, adaptation and desired futures differ from the 'official' ones? The Bergen case study has a slightly different approach: here, CoCliServ encapsulates official projects of Bergen concerning the future, particularly Bergen Council's '*Green Strategy: Climate and Energy Action Plan for Bergen*' and Hordaland County's '*Climate Plan for Hordaland: 2014 – 2030*', and adds voices of citizens which are not necessarily heard in this contest. These voices are both from those intimately linked to Bergen climate policy and science, and those potentially part of a counter-culture to this policy work. The Golfe du Morbihan project also works alongside the efforts of the Natural Park concerning climate change adaptation; in a similar way like in Bergen, CoCliServ adds voices and aspects which are not yet fully covered or even missing from the current official activities. A special focus is on the mobility due to the nature of the Golfe du Morbihan as a sea resort – what does it mean for resilience when house owners are absent most time of the year? In Bergen, the question is a more sophisticated one: what does the 1,5 degree goal look like and feel like in terms of identity? In the Jade Bay area, climate change is already deeply engrained in many aspects of the political, administrative and everyday life. Like in Bergen and Dordrecht, CoCliServ highlights the manifold tensions inherent in the goals and intentions of "Klimaschutz" (climate protection) and extends the meaning of the concept. The main research question turned out to be: what does it mean to be climate friendly, and how to get there? Does climate change imply new forms of "climate democracy"? The action approach of the Kerourien case study highlights the performative character of climate change as both a material and a semiotic phenomenon. Like in all the other case studies, here it



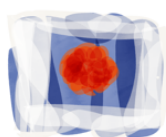
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becomes obvious that when we talk about climate change, we also talk about ourselves and the social climate we inhabit. Maybe Kerourien shows best what climate change is about: the life and well-being of human beings in a highly distorted environment. The underlying question might be: what does it mean to be human in times of climate change?

In D1.3, the case studies include, parallel and / or transcend existing administrative and political activities that are already taken to cope with the challenge of climate change. Tensions and conflicts are part and parcel of each of the case studies; while the fact of climate change and its potential effects are commonly acknowledged, the narratives give an insight into the place-based emergence or coming into being – material and discursive – of climate change. The focus on narratives of change extends the scope of peers which need to have a saying in the process, and they extend the scope of issues that are addressed once climate change becomes an issue in the administration and politics of the respective areas.

In most cases, the usual ‘suspects’ like sea level rise, erosion, flooding, extreme weather events and change of seasonal weather frame the climate problem in a way that is scientifically accessible. But there is an additional factor which is more difficult to grasp, and which could be labelled in a tentative way as the ‘social climate’. The individual Cocliserv case-studies are exemplary in demonstrating that and how the physical and the social climate are inseparably merged once climate change becomes a matter of concern: Absence of house owners or real estate issues in sea resorts are as much a problem as is the rise of the sea level (cf. Golf du Morbihan); European agrarian policies are as much of a challenge as are the seasonal extremes (cf. Jade Bay); migration-, class-, identity- or gender- issues are inseparably linked with weather and climate issues (cf. Kerourien, Dordrecht, Bergen). Thus, the effects of climate change never come or stand alone; quite the contrary, they mostly become relevant because they touch, affect or highlight problems of infrastructure, of identity, of belonging, of ownership.

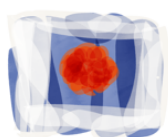


D1.3 is more than only presenting random interview quotes or project protocols. The material is presented in a way that – in most cases – predefines the potential candidates and / or issues for co-development of place-based climate services for action activities. But it also becomes obvious that narratives of change are not data in terms of the natural sciences. Quite the contrary, narratives are invitations for dialogs, they are site- and situation specific, and the researchers and their respective projects are part and parcel of the process. What exactly does climate service mean, and what kind of action does it spur? While in climate research normally deductive and analytical methods prevail, in the case of CoCliServ, the inductive and interpretative approach automatically includes a reflexive element; one of the major findings of D1.3 is that climate services are practices which are deeply engrained in the social, economic and cultural life.

2 Relationship to the Description of Work (DOW)

The objective of WP1 'Narratives of change' is to collect, analyse and compare narratives of local weather conditions and perceptions of climate change from actors on various levels of agency. In deliverable 1.1, we provided an initial mapping of narratives of each site. In deliverable 1.2, we provided a chronology and in-depth analysis of weather-related and place-specific narratives of change. The basis for deliverable 1.3 are 'relevant excerpts from interviews and protocols' as outlined in Task 1.3:

'Identification and in-depth interviewing of key informants: semi-structured and open interviews; interview protocols; participant observation in everyday life, social groups and communal events; observation protocols; identification of key issues, metaphors and storylines, initial identification of desired futures; identification of storylines linking past, present and desired futures; exemplary photo documentation of group environments and locations.'

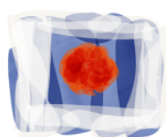


This work package links the spatial (D1.1) and temporal (D1.2) representations and the desired futures in the respective case studies, with a strong focus on the key activities and issues which are relevant for the co-development of climate services, in co-operation with the other work packages. Furthermore, it provides direct input for D1.2 and the scenario exercises in WP2 in general.

3 Theoretical and methodological approach (Werner Krauß)

In D1.1, we identified different forms of representational narratives about the respective regions, such as narratives of identity and heritage, science-based narratives, religious narratives, local narratives about weather or seasonal changes, about disaster and catastrophe and about climate change. This initial mapping of meta-narratives served as an introduction into the weather-worlds of the respective land- and cityscapes. Simultaneously, these meta-narratives define and identify the space of our interventions. This space is not identical with geographical maps or administrative zones, even though they might coincide. But these spaces are now filled with material and semiotic content, with sediments and with sentiments, and they include the air, the weather, and the atmosphere (Krauß et al., 2018 a).

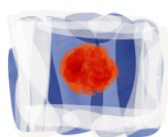
In D1.2 (Krauß et al., 2018b), we provided a chronology and in-depth analysis of these meta-narratives. Like mapping is more than locating narratives on a map, chronology means more than listing events on a time scale. We included different time frames: climate change and geology are measured in millions of years, flood protections have historic time frames, seasons are experienced as cyclical, and weather is a short-term event. In narratives about weather events, these different timescales merge into meaningful configurations of time and space. Relying on Bakhtin's literary theory, we called these configurations 'chronotopes'. The in-depth analysis of narratives about weather events, of landmarks, of habitual practices or literary and scientific reports added time to the spatial representations as presented in D1.1. From here, we proceed to D1.3 in adding a technical term from literary studies, "catachronism".



3.1 Catachronism

By introducing deep time into our analysis, our case studies are clearly situated in the Anthropocene, where a new awareness of geological time is central. Amitav Ghosh's statement that "the *longue durée* is not the territory of the novel" (Ghosh 2016, 59) is also true for ethnographic case studies. Only recently, new trends in ethnographic research include non-human actors and elements of deep time, expressed in new vocabulary like terrestrial, geo-sociality or geo-stories (Latour 2017, Haraway 2016, Tsing 2015). For the co-construction of climate services, in D1.3 we expand the concept of deep time and of the chronotope into the future. In climate discourse, the future is always present, mostly as a dystopia or in catastrophic form. These negative futures raise awareness for the human and non-human processes that have shaped the world as we know it—and of the ways in which our present actions shape worlds to come.

Srivinas Aravamudan (2013) introduced the concept of "catachronism" to designate a specific routine which originated during the Cold War and the nuclear threat. Catachronism invites by her definition the re- or backcasting of the past and the present in terms of a projected catastrophic future. As a literary scholar, she defines "catachronism" as a genre; a genre which is based on speed (soon thresholds will be passed or species extinct) and invites scientific analysis of data. But in defining catastrophic futures as a literary genre, she shifts focus from science-based analysis towards rhetorics: "The shadow of tomorrow's impending ecological disaster leaps over today and reunites with abandoned conceptions of human finitude from a past rich with apocalyptic nightmares that the Enlightenment had temporarily vanquished" (Aravamudan 2013, 9). Thus, the concept of catachronism is closely linked to the one of chronotopes as defined in Krauß et. al (2018b). Backcasting from desired climate futures means more than providing the hard data about the future of objects; with the focus on narratives of change, it is about new ways of imagining the past, the present and the future.



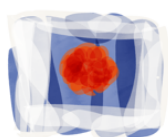
3.2 Desired Futures

Climate futures address automatically geological and atmospheric processes. In global climate discourse, futures are framed by concepts of adaptation, resilience and mitigation, based on the current diagnosis of vulnerability. Mostly, these futures are designed in technical and scientific terms; social and cultural dimensions only play a role when it comes to convince people of following the plan. But there are limits to this kind of geo- and social engineering when cultural differences come into play. Once the human and non-human storylines and their material semantics are included, the focus shifts on landscapes understood as political ecology and as practice. The discussion about desirable futures, 'how we want to live' and 'who we want to be', is closely linked to representations of the past and the present – stories about 'who we were' and 'who we are'. Recasting past and present in the light of the future means negotiating the ways of the interaction among humans and between humans and non-humans. What does it mean for the people of Bergen to live in a 1,5 degree city? How can tourists and absent house owners in the Golf du Morbihan negotiate with a changing sea-site? What do different climates and weather mean to migrants in Kerourien, and how does a city like Dordrecht negotiate economy, rivers and social differences once climate adaptation comes into focus? And how does climate democracy look like in a coastal landscape like the Jade Bay once terrestrial forces are included?

Each of the case studies presents challenges which are unique to it and only to a certain degree comparable to the others. In interdisciplinary social climate research, certain common methodologies and concepts were developed and tested. We have already presented in D1.1 (critical) discourse analysis. For the purpose of D 1.3, we rely on a common methodological framework, namely postnormal science and actor-network theory.

3.3 Postnormal climate services?

In D1.3, we identify and select specific conflict- or problem constellations with relevance for the co-production of climate services. In doing so, we introduce the

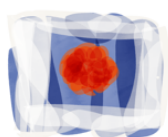


category of uncertainty into our scheme, understood as something that is emerging, unfolding, coming into being without already being fully categorized or being completely understood. While weather events, a drought or a flood are interpreted as effect of climate change, the conclusion what to do is still unclear. These situations are characterized by a high degree of uncertainty, values are involved, the economic stakes are high, and decisions have to be taken. These are the definitions of postnormal situations, which cannot be solved by science alone. While the IPCC and its national knowledge providers in many cases routinely provide the scientific information that is needed for coastal protection, the adaptation of cities or landscape formations to climate change deserve extended peer groups such as the inclusion of citizens into the process of decision-making. But how does a postnormal climate service look like when the issue at stake is not the question of what is to be decided about, but how are decisions taken? Who has the right to decide, who is included and excluded, and why seem so many decisions to be beyond democratic control?

3.4 Actor-Network Theory

From the beginning, we tried to identify situations where the co-production of climate services for action makes sense. As a methodological frame, we shared the basic assumptions of actor-network-theory. Actor-Network-Theory (ANT) was developed by Michel Callon, John Law and Bruno Latour (for an overview, see Latour 2005, Krauß 2006). It comes from Science and Technology Studies, with a strong focus on the agency of 'things' and non-humans. ANT gives equal importance to things and people when analyzing specific conflict constellations. It uses the same vocabulary for the agency of humans and non-humans, of people and things, and it is interested in the process of how something comes into being (or not).

The background for Bruno Latour's use of ANT is *political ecology*. From early on, Latour insisted that politics is always *about something*: about bodies, materials, landscapes, rivers, conflicts, unforeseen events, weather, power, or whatever. When it comes to climate change and adaptation to its effects, we talk about human and not-human



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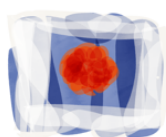
actors: about mayors, administrators, activists, concerned citizens etc, but also about rain, rising sea level, dikes, migration, draughts, tides, geology etc. Once we see it that way, climate change is no longer something 'out there', but one of what it means to be 'in here'.

Thus, ANT differs from purely science-based climate discourse, which seeks to convince people of something, based on scientific knowledge about climate. For ANT, climate is not a fact only, but a multi-faceted process where many different actors (human and not-human) are involved, interact and co-develop something – a thing with agency.

ANT focuses on processes and performances, and the best way to start research is "mapping controversies" (or situations). So what does mapping controversies mean in terms of research? We followed some guiding questions such as:

- What is the case? What is at stake? (for example, climate adaptation, or education of the public, or more general questions)
- Who is involved? Which people (who is leading the process, who is participating), which "things" (like rain, the sea, canalization, dikes, passports, identities....)?
- Who is not included yet or excluded?
- Who should be involved, whom do we want to include into the process? Whom do we want to give a voice? And why? This means the inclusion of people, but it can also mean the inclusion of ideas or things that were not considered yet.

These are some of the guiding questions, some of them were already answered in D1.1. and D1.2. Now it is the time to describe these specific and narrowed down situations in detail, with the help of protocol excerpts, interview excerpts, comments and so on. How do people talk about rain (for example), and what does this say about the rain, the people, and their relation to the political ecology of the place? Interview excerpts help the scenario-, metadata-, quality control- and other WPs to understand what is at stake in the specific places. With the help of ANT, now we talk about something that



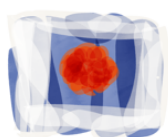
really is at stake in Kerourien, in Bergen, in Dordrecht, at the Golf du Morbihan or the Jade Bay. Climate is now no longer an abstract scientific fact, but something deeply local, situated and a process where people and things are involved, in a dynamic way.

Finally, we focus on the desired futures, on the imaginaries or desired interventions that are expressed in the interviews. The configurations of people and things – of people, politics and weather, for example – are shaped by the past, but also by the imagined or desired futures. In science-based climate discourse, facts prevail: because the water is rising, we have to do this and that. In our social science approach, facts have a past and a future, they become part of a process that is open to intervention and to co-development. This is the contribution that ANT and ‘mapping controversies’ can make.

4 Case Studies

4.1 Case Study: Dordrecht (Benedikt Marschütz and Arjan Wardekker)

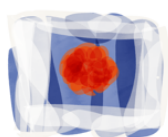
In the Dordrecht case study, we are actively collaborating with the Municipality of Dordrecht in climate-proofing the city. To make our input more concrete, we are not only focusing on municipal efforts, but particularly on the Reeland district and Vogelbuurt neighbourhood in specific. The city faces water from all sides: the surrounding rivers, the rain, groundwater, and the nearby sea, and the topic of water in particular plays a key role in historical events, current issues, and perceptions of the future (Krauß et al., 2018a, 2018b; Marschuetz, 2018). Climate change plays an important role in exacerbating various water-related exposures and risks. The municipality has been highly active on climate change adaptation and is aiming to strengthen the involvement of citizens in that process. However, authorities and citizens may hold different narratives and framings of weather, water, and climate in Dordrecht. Such differences can yield highly divergent future visions, preferences for adaptation options and other interventions to climate-proof the city, and needs for



knowledge and (climate) services (e.g. Wardekker et al., 2009; De Boer et al., 2010; Wardekker, 2016, in press). Consequently, we explore: what insights do local narratives in Dordrecht offer to develop a resilient and desirable future under the influence of climate change?

4.1.1 What is the case? What is at stake?

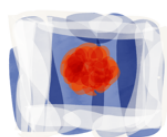
A variety of topics is discussed in the narratives on weather, water, and climate change in Dordrecht. Interviewees narrated richly about the historical and ongoing struggle of the city with water, which is shaping its fate until today and is expected to be a significant stressor due to anthropogenic climate change. The Isle of Dordrecht itself was formed by a major historical flood event, greatly impacting the city's development and identity. Clear differences emerged in how *authorities* and *citizens* perceive, evaluate, and would like to manage such issues. Authorities narrated strategically, in a managerial manner, on dealing with challenges ahead. In contrast, citizens narrated in a more holistic manner about weather, water and the effects of climate change, which they expect to worsen sooner rather than later. However, there are also similarities. Particularly, both groups presented a high awareness of current and potentially worsening future impacts of climate change in Dordrecht and employed this as an underlying motivation for action. See Table 1.



Deliverable 1.3
Relevant excerpts from interviews and protocols

Table 1: Differences in perceptions of issues at stake between authorities and citizens (quotes from Marschuetz, 2018).

Authorities	Citizens
<p>Adaptation to water and weather-related extremes</p> <div style="border: 1px solid black; padding: 10px; margin-top: 10px;"> <p><i>“So we are of course trying to make sure that this whole neighbourhood is far more a sponge. ... Hopefully, it will, make sure that it doesn't get there, but that's difficult. There are, in Reeland, that is such a neighbourhood, is very very vulnerable, because they have a lot of these holes.”</i></p> </div>	<p>Noticing increasing extremes around floods and weather</p> <div style="border: 1px solid black; padding: 10px; margin-top: 10px;"> <p><i>“I see that the water level becomes higher every year. The cay at the Meerwede is flooding once a year, and this is a real problem. [...] The world changes! [...] Temperature! The temperature, it's now 29 degrees, warmer, and warmer and warmer. The North pole, down under, it's melting. The sea level is higher, higher, higher, also the rivers! [...] and we need to do something about it.”</i></p> </div>
<p>Climate adaptation</p> <div style="border: 1px solid black; padding: 10px; margin-top: 10px;"> <p><i>“I've always been really hammering on go for something else, look into a different strategy. We are very good in these dikes but I don't think we should see it as the solution. In the future I doubt it is the solution.”</i></p> </div>	<p>Point out the need for climate mitigation</p> <div style="border: 1px solid black; padding: 10px; margin-top: 10px;"> <p><i>“[...] we all have to do our part ... as small individuals, to help. Like simple thing, the CO2, we have one car, ... it's really a small thing ... but maybe if everyone thinks ... maybe it becomes a big thing. So I always think start with yourself. I don't eat a lot of meat, because that's really bad for the climate and for the air, so I cut my meat radically, one time a week, two times sometimes. So the small things I think, that's what I can do.”</i></p> </div>



Deliverable 1.3
Relevant excerpts from interviews and protocols

Risk governance

"[...] to focus more on rescuing than on evacuation. So that we have to face that in the case of the flood, maybe more than 100,000 people will be trapped in their houses or high buildings in Dordrecht, and that we have to prepare a way to bring them in safety [...]"

Preparation for a major disaster but lack of knowledge on current and future risks, potential impacts, etc. (while awareness is very high

"Dordrecht is not so big of course, it's a small island, as the people say we are living on an island. You are surrounded by water, and yeah, how long does it take until it goes not well anymore, I don't know. ... if people continue living like this and are causing problems with the poles, then it can be max. a few years (until this happens) ... but very fast."

Strive to involve citizens, but not actively doing

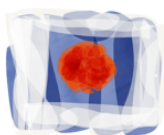
"You have to take people with you, you have to involve people very closely because then the chance of success is much greater. And I think that this is where the opportunities lie, particularly for these neighbourhoods [Wielwijk and Vogelbuurt neighborhoods respectively]. Because people see that their neighbourhood is improved, that quality is added, not only physically, but also social structure."

Citizens do not see authorities acting on climate mitigation or adaptation, or generally of matters of concerns

"It's also a job for the local government, "how serious are we taking that problem", because in the end it's you're talking about the lives and the way people are living in Dordrecht you can't take it lightly that's what I mean. [...] That's the whole questions, "how serious is it?", I think it's quite serious, and I think the local government is a bit like "yeah it is serious, but yeah it's also really expensive to do something".

Underlying reason for action: climate change, but not addressed and communicated as directly related to

Climate change serious, thus mitigation needed and should be happening at



Deliverable 1.3
Relevant excerpts from interviews and protocols

climate change (sometimes)

“Dordrecht will face very high level, water levels, in storm incidents, more frequently and more severely. So not every year, but once in so many years, we are quite sure that there will be westerly storm winds in which we have to close all the sea-openings, and then in the meanwhile there will be a lot of rain in Germany for example, where the rivers get very high and then you close for 2 days or so all the gates, and the city will drown.”

institutional level

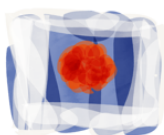
“I [...] hope it won't be a very big disaster because Holland is, I think half of Holland is in big trouble if the sea is rising. [...] you can't live there anymore then ... if they neglect the Deltaworks then we could get a lot of water in big parts of Holland (laughing), so many people will die then.”

Claiming that citizens do not really know about big disasters (partly true but different knowledge existing nevertheless)

“[...] some weather-related events, which is lots of rain and then some wind events. [But] That's not that it was giving big trouble to the people [...], the roof of 8 or 10 houses came off (laughing). It's for the people who face these problems it's a huge problem but for the scale of the city it's [...] not in terms of disaster or crisis”

Knowledge of extremes and possible pending disaster

“[...] if there is water in the street then there will be consequences. [...] the whole social structure will fall apart for a period of time ... and then I mean really water in the streets like a dike breaks through or such heavy rainfall that you have to literally take a boat to get to the supermarket [...] and if that happens here I think there will be a lot of, I think it's also a bit too late. [...] when there is a disaster in a country like the Netherlands then there is money ... but it's a bit too late by this point [...] I don't think we are really that far away from a situation like that. [...]”



Deliverable 1.3
Relevant excerpts from interviews and protocols

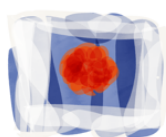
Focus more on long-term and strategic activities

“And then you have all kind of scenarios which may occur when things get wrong, what kind of measures you take ... and train the scenario teams also the right participants in your environment because you address the water crisis not alone but you have also to do with municipalities, with safety boards, with fire departments, with the public civilians and in companies themselves which also address questions. So it's basically network management. A kind of information management and crisis communications [...]”

Expecting a big disaster and rather extreme climate change related sea level rise sooner than later

“We may have a dike here, but if everything breaks, this one here is gonna be under water too. [And] I think it's a good possibility with the rising sea levels, and we've to keep putting more infrastructure in the whole coastline to keep us safe [...] I don't really think it will be durable to protect the whole Netherlands in the future ... It's a worry. [...] we have now the Deltaworks of course, but if those fail, all of South Holland, and part of Brabant and Zeeland, they are all at risk, and in my opinion the Deltaworks are [...] getting old [...] so I think one day [...] it might fail. [...] maybe all dikes will break loose and then the water is gonna be until Utrecht and then there is no Dordrecht left. I can't predict what the future will bring.”

The various interview transcripts were synthesized into several narrative themes. A comparison between authorities and citizens revealed both similarities and differences in narratives. See Table 2. Notably, several key narratives emerged in both sets of interviews: those related to historic disasters, water shaping the city into an island (with island identity), a clear need for transformative and collaborative future change, but clear challenges to setting this process in motion due to socio-economic and governance barriers and constraints. Several differences can also be observed. Authorities base their argumentation in a vulnerability narrative, observing that Dordrecht faces specific challenges due to its geography and climate. Consequently, large scale adaptation is necessary to reduce this vulnerability. Large scale, in this case,



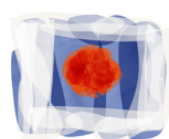
Deliverable 1.3

Relevant excerpts from interviews and protocols

means large spatial and temporal scale and significant impact on society and other sectors (but reasoned from the goal of water/adaptation). Citizens on the other hand base their narrative in observations and experiences with weather and water. They note changes and extreme events and relate these to climate change. In response, they indicate various small scale, local actions that they are taking or can take to cope with water and improve their broad environmental behavior. This is more small scale, geographically and temporally, but involves a more multifaceted, multi-goal perspective (water/adaptation, but also sustainability, social cohesion, spatial & housing quality, economic issues, etc.).

Table 2: Core narrative themes, as shared or diverging between authorities and citizens (Marschuetz, 2018).

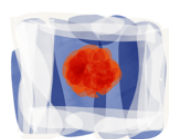
Shared	Authorities	Citizens	Description
Historical narratives			Past and ongoing struggles of the city with weather and water: <i>The disasters of 1421 and 1953 brought suffering and damage to Dordrecht.</i>
	Vulnerability narratives		Location and burdening constellation of threatening events: <i>The city faces specific risks due to sea and rivers and might drown again.</i>
	Adaptation narratives		Reason for and substance of adaptive measures by authorities: <i>History and climate change as reminders to avoid a new tragedy by acting on water.</i>
		Experiential narratives	Experiences with weather, water and climate change: <i>Sometimes it floods minorly but soon expected to be serious due to climate change.</i>



Deliverable 1.3
Relevant excerpts from interviews and protocols

	<p>Action narratives</p> <p>Occurring adaptive and mitigative activities by citizens: <i>Some have pumps or collect water, others try to stop emitting CO₂ and/or are vegan.</i></p>
<p>Identity narrative</p>	<p>Specificities of the city as being an island i.e. shaped by water: <i>Dordrecht was wealthy and important but is now a small island surrounded by water.</i></p>
<p>Socio-economic constraints narrative</p>	<p>Restraints towards effectively achieving climate resilience: <i>Old houses and poor inhabitants that are having problems in all spheres of lives while financial and social problems appear more important than the noticed threats.</i></p>
<p>Future-perspectives narrative</p>	<p>Stances for a future with climate change and remedies to threats: <i>Ambiguity to keep the island safe in the long run and limits of dikes are approaching, which is why alternative measures and preparation for disasters are needed.</i></p>
<p>Governance narratives</p>	<p>Possibilities and constraints towards collectively tackling issues: <i>Achieving resilience together by thinking long-term and truly collaborate.</i></p>

We further explored these similarities and differences from the viewpoint of 'framing'. Framing means that people "select some aspects of a perceived reality and make them

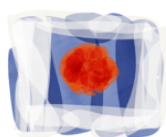


more salient... in such a way as to promote a particular problem definition, causal interpretation,

moral evaluation, and/or treatment recommendation" (Entman, 1993). In other words, narratives can differ in how they describe: what problem, for whom, what's causing it (and making it worse or limiting impacts), what values should be taken into account in decisions, and who should do what about it (Wardekker, in press). Several observations can be made for Dordrecht. See Table 3.

Narratives conveying awareness for exposure to changes in water, environment and climate attribute phenomena with climate change while stressing the exacerbating vulnerability for Dordrecht that is arising out of climate change and threats it poses within a climate threat frame. Some interviewees name climate threats as being beyond their control, with some stating concrete actions as shown and framed below also marking at least some discrepancy on that end. Moreover, the observed and increasing vulnerability is shared among conveyed stories and stresses the specific vulnerability of Dordrecht since it is facing specifically due to its location and being an island a specific risk. Framing around possible events that did already occur in the past is here very prominent such as the threatening combination of a westerly storm and high discharge at the rivers. Awareness and detailed knowledge of phenomena are conveyed and stress the vulnerable state of the city, manifested to some extent even within a certain identity of the city. Lastly, a common frame is stressing the occurrence of problems around extreme rain events and water, expected to be worsening in the future respectively.

In contrast, diverging use of frames stressing constraints is observed, with authorities stressing meta-constraints such as financial limits for adaptation and the share of built environment within the city as seen below. Authorities frame their stories so as to convey the needs for strategic water management in order to deal with severe events that can according to them not prevented. Inhabitants stress in their stories a more holistic interaction between social issues and constraints related to their life-



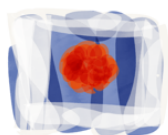
Deliverable 1.3

Relevant excerpts from interviews and protocols

realities that appear of high importance to also deal with the what they frame as worsening character of climate change. Frames that aid in conveying their activities are focusing more on the climate mitigative aspects of possible action so as to prevent climate change in the first place, naming though also some occurring adaptive measures as being important.

Table 3: Utilized frames, as shared or diverging between authorities and citizens (Marschuetz, 2018).

Shared	Authorities	Citizens
Climate threat frame		
Vulnerability frame		
Problem frame	<i>Constraints frame: meta-constraints around finance and economy, urbanized environment, etc.</i>	<i>Constraints frame: Social issues as constraints, structure of the community, poor social network, low education, poverty. Individual problems more pressing in the neighborhood than</i>



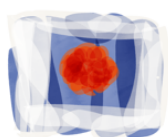
Deliverable 1.3
Relevant excerpts from interviews and protocols

	climate change or changes in the environment
<i>Severity frame:</i> limited possibility of prevention	<i>Severity frame:</i> worsening character of climate change affecting the city
<i>Action frame:</i> treatments and measures for effects of extreme weather- & water related issues, managerial approach towards risks, adaptation	<i>Action frame:</i> Climate mitigation behavior

4.1.2 Who is involved? Which people, which “things”?

The Netherlands has a fairly intricate system of responsibilities for water management from sea, rivers, rain and groundwater, at the local, regional, and national level. These authorities are the ‘classic’, formal actors on weather, water, and climate. Another key group of people are the citizens and citizen-led initiatives. These of course include individuals, of various socio-economic, professional, and educational backgrounds. Citizen initiatives may have been established by the citizens themselves, or through the municipality. Many other actors play a role as well, such as NGOs, public agencies, public-private partnerships, knowledge institutes, and companies. A list of specific organizations includes:

- Authorities
 - o Municipality Dordrecht (local)
 - o Delta Program (national)
 - o Rijkswaterstaat: Ministry-division on water (national)
 - o Province of South Holland (regional)

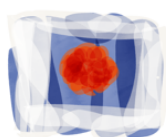


Deliverable 1.3
Relevant excerpts from interviews and protocols

- Safety Region South Holland-South (regional)
- Waterboard Hollandse Delta (regional)
- Citizens and citizen-initiatives
 - Individual citizens
 - Vogelnest neighborhood community café and office (funded by the municipality)
 - Weizigt sustainability education centre
 - Platform Duurzaam Dordrecht
- Other actors
 - WWF
 - Spuilab210 (Living Lab, collaboration of Municipality of Dordrecht, EcoShape, Bureau Van Veen)
 - Knowledge institutes, such as Utrecht University, Erasmus University Rotterdam, UNESCO-IHE, NKWK National Knowledge Program Water & Climate
 - Consultancy companies, such as EcoShape, Bureau Van Veen, BaxCompany
 - Social housing agency

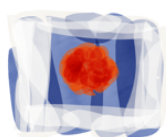
Several 'things' play key roles in the local narratives on weather, water, and climate. These include local and national identities, physical concepts such as climate, weather, and water, and governance concepts such as socio-economics and spatial plans.

- Identities
 - The Island (local identity): Dordrecht is perceived an island by both local authorities and citizens. The Isle of Dordrecht is a formal name, and it is surrounded by rivers. The island is exposed to water and continuously shaped by it since it was formed by water. This has had consequences for the local socio-economic situation, and vulnerability and approaches to dealing with weather, water and climate.
 - The Dutch and Water (national identity): The 'struggle against the water' is deeply embedded in Dutch national identity, particularly resulting in (and



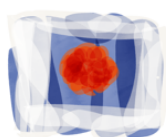
from) dike building and land reclamation (e.g. polders). This has had a significant impact on how the Dutch approach water management. Particularly, the classic Dutch approach involved 'resistance' to water, keeping it out of the city, through engineering approaches. Since water management involved many parties and interests, it also influenced the cultural approach of collaborative, discursive management. E.g. the Dutch word 'polderen' means to discuss with many involved parties to reach some form of agreement or compromise. Recently, Dutch water management approaches have been shifting to become more accepting of the water, focusing on 'living with water'.

- Physical concepts
 - o Climate
 - Sea-level rise due to climate change
 - Climate change and extremes brought about by it: extreme rain events (summer) and high river discharge (autumn/winter)
 - Heat stress
 - o Weather
 - Changes in weather patterns affecting Dordrecht (more extreme conditions of both heavy rain and drought)
 - o Water: *The rivers, the sea, and the combination of these leading to "apocalyptic" floods, it happened in the past and it is expected to happen again in the future.*
 - Storm and a resulting flood approaching from the sea
 - Flood from the rivers (which surround Dordrecht)
 - Drought (resulting in e.g. soil subsidence)
 - Sewage systems cannot cope with extreme rain events
 - o Bathtub Dordrecht: *The city secured itself against the water coming from the outside as much as possible but now the water that is coming in the form of*



rain from the sky cannot be removed, thus Dordrecht is filling up like a bathtub.

- Soil: Dordrecht's specific exposure to water and risks from heavy rainfall becomes exacerbated by the fact that in many locations badly penetrable soil in the form of river-clay is present, which makes the island more stable against erosion during floods but at the same time rainwater accumulates easily on the surface and causing local floods as exemplary seen above (Marschuetz, 2018).
 - Located under the sea-level: elevations vary in the city, the location of the Vogelbuurt neighborhood is located between approx. -1.5 and +0.5 m in reference to the NAP (Normal Amsterdam Peil/Sea-level) (AHN, 2018).
 - Low dikes. These may not be enough given future projections of sea level and river discharge.
- Governance concepts
 - Socio-economic constraints
 - Socio-economic constraints, i.e. financial constraints and economic vulnerability of the municipality. Dutch municipalities have recently been handed down new social care tasks (by national government), putting further pressure on the budget. This is also a driver for new housing development, especially trying to attract higher socio-economic classes, in order to develop more tax revenue.
 - Local socio-economic constraints: poverty, conflict, lack of education, poor social networks. These factors enhance citizens' vulnerability. They could also reduce support for (some) adaptation measures, as citizens have other things to worry about.
 - The Spatial Plans

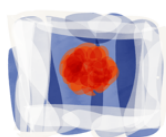


- Lack of green structures in the city, thus no climate buffers. There is a high level of artificial, paved surface, and current green infrastructure lacks accessibility.

- The rules
 - Existing rules regulating activities in the city (municipal rules), which pose also some constraints for citizens to act. Citizens perceive them as limiting and inflexible to their initiatives (Marschuetz, 2018)

4.1.3 Who and what are not included yet but should be given a voice?

- Future Visions
 - Holistic visions of climate resilience and climate action, that combine impacts & adaptation with mitigation and socio-economic challenges. The authorities currently have a focused approach, emerging from departmental and legally embedded tasks and responsibilities. However, citizens approach climate, water and weather issues in a much more integrated way.
 - Positive future visions. Narratives currently focus rather heavily on climate impacts and vulnerability. More positive framings of the future and local goals in the local visions could be helpful and engaging.
- Communication Strategy. Authorities currently communicate with citizens where direct needs emerge and are perceived, which runs the risk of being rather ad-hoc. More strategic, systematic communication and interaction with citizens could be beneficial.
- Collaborative climate action. A systematic approach to collaborative action, focusing on communication, concrete actions, and policies that support such collaborative action. Currently, the municipality aims to collaborate with citizens, but run into challenges in doing so. At the same time, citizens are willing to collaborate with authorities and initiate efforts themselves. However, they observe



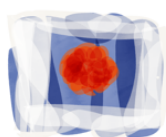
little action and communication by the municipality, while running into regulatory barriers with their initiatives.

4.2 Case Study: Bergen (Scott Bremer)

Global and local climatic change colours debates about the future of Bergen city. Visions for Bergen in 30 or 50 years are increasingly pictured in a global context – Bergen in the world – and in a context of flux – Bergen as shaped by increasingly rapid climatic, natural and social changes. As seen in Deliverable 1.2, climate change is fast emerging as a pervasive matter of concern in Bergen, and it is arguably transforming the sense of place and identity in the city. Bergen is fast becoming the portrait of a ‘climate city’; a label it proudly displays for the future.

But visions of Bergen under a new climate also introduce tensions. There are tensions between images of global change, and place-based images of Bergen as specificity and continuity. Tensions between a traditional, and a bold new city. Tensions brought about by an already highly international community becoming increasingly international and diverse, and the different visions it brings. Tensions between local wishes and national or international climate politics. Tensions about the causes of climate change, and relevance of mitigation efforts. And tensions between formalised visions in city policy documents and strategies, and the visions of individual residents who confront ‘the city’s’ visions.

It is this debate, about future visions for Bergen in the context of climate change, that the Bergen study site focuses on here, and views through the lens of ‘actor network theory’. It empirically draws on 18 narrative interviews with Bergen residents, and the formal visions for Bergen as encapsulated in local government policy; particularly Bergen Council’s *‘Green Strategy: Climate and Energy Action Plan for Bergen’* and Hordaland County’s *‘Climate Plan for Hordaland: 2014 – 2030’*. It hopes to tease out the network of connected elements in this debate revealed in these empirical sources. The study cannot claim to be a complete mapping of this debate, focussing as it does



on the perspectives of just 18 people. But it can claim to present a rich picture of this debate, drawing as it does on the diverse perspectives espoused by quite different people working in different institutional milieu; both those intimately linked to Bergen climate policy and science, and those potentially part of a counter-culture to this policy work.

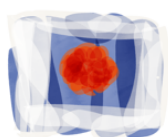
4.2.1 Bergen as place, Bergen as identity: Key characteristics of Bergen today

Imagining Bergen in the future begins from recognition of the specific characteristics of the city today, which distinguish Bergen as a unique place that imparts a strong identity on those who live here. This research found that visions for Bergen's future usually sprout from elements of place that Bergensers find important now. At the beginning of our interviews with Bergensers, we asked them, "How would you describe Bergen to someone who had never been here?", and their answers often found resonance in their answers to the last question of the interview: "What is your vision for Bergen in the future?" Employing an 'actor network theory' lens, these elements of place are important actors in debates about the future of Bergen, including under a new climate.

Here we go through place-making elements in Bergen as raised in 18 narrative interviews with diverse residents. This work compliments and extends on the discussions of place in public narratives in Deliverables 1.1 and 1.2. and, following the ANT approach, gives insights on which people are involved and which "things" are essential in the Bergen case study. These elements will, in turn, be linked to discussions of visions for Bergen's future.

4.2.1.1 A natural setting

Bergen is defined by its natural setting on the 'rainy west coast of Norway'; "a very compact city [...] compressed between mountains and the ocean" (Int. 10). Bergen's seven mountains 'surround the city centre' as a natural barrier; "...the centre is so small



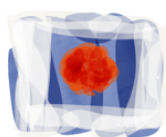
that you only need to walk ten minutes and you meet a mountain, and so in a way the city ends. So, yes, sometimes it may feel a bit [...] cramped here" (Int. 3). This 'direct contact with nature' contributes to the city's exceptional 'beauty' for many; with one respondent saying "one must emphasise the green and the blue" (Int. 6) and another saying, "here it's green and it's fresh" (Int. 12). Bergen's beauty is also tied to its dramatic seasons - "here it's full on: it's full on winter, it's full on summer" (Int. 10) – and the interplay of rain and sun. The explosive on-set of spring is particularly spectacular, when the wet winter months are replaced by spring sun: "Its beautiful in this part of Norway, when there is sun, because it is so wet over the rest of the year. Look at the difference in May in the East of Norway and May in the west. Its two different worlds, two different colour spectrums" (Int 11). The interplay between the mountains and the weather is also captured in an image of Bergen as a 'rain hole'; "A city in the west receiving all the humid winds and clouds that are pushed up against the mountains" (Int. 2).

Bergen's close relationship to its natural surroundings is discussed as making Bergen "a very special city" (Int. 1). Bergens nature is an important actor in defining the future of the city.

4.2.1.2 'A cosy small town'

Bergen is valued as a small to medium sized city 'where a lot happens'. A city at a human scale; 'nice', 'cosy'. 'walkable' and 'intimate', as Interviewee 14 explains:

"we are a tiny big-city or a big small-town, but we have all the facilities of a bigger city. You can do anything you want here. And you have the anonymity of living in a city, while at the same time having a closeness that gives you a clear identity of being from this city. And I think it has something to do with having such a compact city centre, so that when we go to town, we're all going to the same place. Its also that when you go into town, you often bump into people that you haven't seen for a long time, because you see them on Torgallmenningen"



The human scale of Bergen city centre is important for many people who live in Bergen, and remains an important part of the future vision for the city.

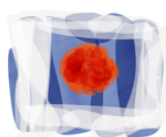
4.2.1.3 Open to the world

Much is made of Bergen's traditional maritime connections to the world, and the 'openness' to international cultures that this brings; "We long had more communication outside of Norway than within Norway, because it was more difficult to get to Oslo than to get to Hamburg or London" (Int 1). The city is thus often framed as a port city, with links to shipping, oil and fish, and other nations. The internationalisation lends the city an energy and vibrancy; "it's a vibrant city because it has been a focal point for trade for a long time. So it's not just locals living here, there are a lot of people moving to Bergen, and people here travel a lot, so even though in many ways it is quite remote, it doesn't feel as remote as many other places" (Int. 7). This openness is combined with the city's reputation as a 'historic' and 'cultural city' - "A place where a lot happens. Yes, an active cultural life" (Int. 3) – to attract a swathe of tourists each summer, transforming the city, and cramming the port with cruise ships.

This openness, seeing Bergen as long part of a globalised world, is central to visions of Bergen's future. With global changes, like climate change, Bergens role in a connected world becomes even more emphatic. Most policy documents visions of Bergen under climate change emphasise the mitigation aspect; a carbon neutral city, doing its part for addressing a global issue.

4.2.1.4 One of the wettest cities in Europe; weather and light as identity

Most people talked to agreed that Bergen's rain lends an identity to the city, with interviewee 4, a journalist, noting, "I think that its a self-enforcing awareness: the more people talk about it, the more it becomes sort of a stamp". In this way, there is a body of lore and humour around rainfall, and particular local habits; a place where people "always have wet weather clothing with them" (In. 13) and "an umbrella in their suitcase" (Int. 18). One long-time Bergen resident said:



"I give this one very simple description of the climate in Bergen, that it rains about 570 days of the year. That's flippant from my side, but I have learned to call rain 'Bergen sunshine', and that way I have sun all the time. Yeah"

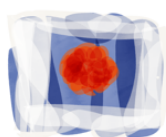
But while Bergensers in many ways embrace their 'rainy city' identity, they also voice resentment about a negative stigma attached to Bergen's rain by those living elsewhere in Norway; "People from other parts of Norway talk about Bergen in terms of it being a wet, rainy place, and often this will be something that comes up early in the conversation" (Int. 4). Many want to push that the city is more than its rainfall, as one interviewee in interview 11 (a focus group) said, "[the rain] is not the first thing I want to emphasise", and another said "when you are somewhere in Norway and they hear where you're from, it's a bit like 'Oh, yeah, Bergen, yeah.' They have an idea about who you are and how Bergen and the city is [...] But I want to say that rain is one part of the identity." Others argue that Bergen's rainfall is not so unique as its made out to be; "There are places where it rains more along the west coast of Norway, a lot more even, but Bergen is most famous for it" (Int. 12). Or, "I'm always unsure whether it's raining so much more than many other places or whether it's become part of our identity that in Bergen it's an insane amount of rain" (Int. 14).

Two people we spoke with were more concerned with Bergen's long dark winter months than with its rainfall; "It is in a way, but for me personally, the seasonal aspect that I struggle the most with is the darkness. That affects me, and that's what I probably would tell people about too" (Int. 8).

Bergen's identity, impacted by its climate, also shapes visions for the future of the city. If climate change is to bring more rain, this can only further conform to an already strong identity of 'living under the rain'. If it brings less rain, then the locals will be glad of the respite.

4.2.1.5 Home to Bergensers

A fifth way of defining Bergen is by the people who live there. Many make general reference to the kind of people that live in this city on the wild west coast, close to



Deliverable 1.3

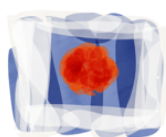
Relevant excerpts from interviews and protocols

nature and impervious to the weather; “a patriotic small city” (Int. 2), “with a large self image” (Int. 11). A city of friendly people, who are ‘proud of their heritage’, ‘outdoorsy’, ‘engaged’ in city affairs, and relatively ‘open and direct’ in their dealings with others. Two people noted how the weather also hardened Bergen’s society; for Bergenser, “it is embarrassing to not be able to handle the rain in Bergen” (Int. 16). The rain is an ‘acquired taste’; “I think that even the wet and cold part you can brag about because it indicates that it’s a rugged place, it’s a tough place. If you’re sensitive to weather you probably shouldn’t be here” (Int. 9).

Despite the fast changing make-up of Bergen’s society, with increasingly foreign residents, the stereotype of the proud, rugged, and forthright Bergenser persists, as the kind of people who will live in Bergen of the future. Some cite this ‘built-in resilience’ as insurance against even the most dramatic changes that the future may bring.

4.2.1.6 Bergen today in climate policy

Looking to the two policy documents, ‘The Green Strategy’ and the ‘Climate Plan’, there is little account of Bergen as it is today. Both documents begin from a future vision of Bergen, facing climate change, with the only reference to Bergen today in the Green Strategy addressed under a description of the ‘conditions’ framing this visioning exercise, and ‘challenges outside of the agency’s remit’, and the Climate Plan limited to a description of greenhouse gas (GHG) emissions and energy use in Hordaland and Norway today. This may be reasonable for climate policy, but does highlight three things. First, these climate policies have a strong emphasis on climate mitigation, with an apparent secondary focus on adaptation. Second, that this mitigation emphasis comes with an inherent far-looking view to the future. And third, that these climate policies mainly limit their concern for Bergen today to GHG emissions and energy use.



4.2.2 Visions for Bergen under a new climate

4.2.2.1 Visions voiced in the narrative interviews

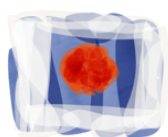
The last question of the narrative interviews asked respondents very generally for their 'vision for Bergen in the future', with the unsaid implication that it should be a Bergen resilient to a new climate. Sixteen answered this question; in two interviews the question was not asked because of time limitations. Many started discussing climate resilience measures, and broadened to consider other, less-directly climate-related parts of their vision when prompted.

Some interviewees started by stressing the huge uncertainties about what Bergen and the local climate will look like; "Yeah, I don't know. I believe that it is so incredibly uncertain. There are so many contradictory things that can play a role [in shaping the city]" (Int. 3). Or as someone in Interview 11 said, "I don't know. How will Bergen look, what will people do in 100 years?". Related, some stressed that global climate change is beyond the control of Bergensers alone, despite local mitigation measures; "It is a difficult question because the kind of changes are global, so we can't stop or divert the changes ourselves" (Int. 4).

Despite these uncertainties, and factors beyond our control, we can distinguish 11 different aspects to the visions put forward by respondents. Some related to the democratic, scientific and policy processes and capacities we need to have in place; others focused on the physical structure of the city; others on social practices; and still others on the industries the city can attract and develop. Most respondents mixed two or more of these aspects in their vision, but there were not any particular aspects that were talked about much more than any others. Below these 11 aspects (in bold) are grouped under five headings and discussed.

4.2.2.2 Building Bergensers resilience; process and capacity

Six respondents voiced optimism for the future, come what may, because they considered **Bergen institutions and Bergensers are resilient to climate variability**

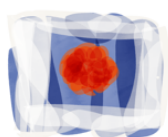


and change, built from years of living with an intense and changeable climate. This capacity is talked about relative to local government; “So, if we are going to talk to that about adapting, I have to say that I have faith in Bergen, in that they take [climate adaptation] seriously and have been doing it for a long time already” (Int. 18). Or as another person working in local government said, “If you talk to the leading people on water and sewage system in Bergen, they have been talking about [climate adaptation] for years and now they are developing a plan for the overall water system. I think the competence and capacity in Bergen is where it should be” (Int. 2). It is also talked about relative to Bergen’s residents, who may have to live with more rainy days, as one climate scientist said; “A little bit more rain too, but nothing we can’t handle”. As one respondent said, “There will still be some nice days and that’s all Bergensers need, to re-set the clock” (Int. 11).

But some respondents (6) went on to say that Bergen would be more resilient by **better developing local climate science and policy**, such as “another approach to risk assessment related to the building process” (Int. 11). One local government planner expressed his frustration:

“how can you rig the system so that these decisions [to mitigate and adapt to climate change] are made today? [...] If the research environment could provide visualisation and secure information, and get it out there, so that it’s impossible to not get to those decisions, that would be awesome! If we could provide guidelines and checklists to the municipalities to do this, that would be really helpful for the administration in the municipalities, because what they need is hard facts and secure projections on how things will be if we don’t do this and that” (Int. 2)

Others (5) talked about how to **build political will** among politicians and residents alike, for making ‘wise’ decisions related to climate resilience. Two respondents, both in local government, felt optimistic; “There are a lot of people that are concerned with the climate and environment, that’s for sure” (Int. 6), and “I think that Bergen has the potential to have a transformative force, and there are politicians now that would gladly



be the leading stars of this in Norway” (Int. 2). But one respondent felt that there should be a focus on building political will at the neighbourhood scale; “I think that in having people make better choices, its easier if you yourself feel connected to the place you live and the people that live around you” (Int. 14).

4.2.2.3 Growing up in a small, safe town

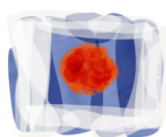
Three respondents felt it was important that Bergen **remain a medium-sized, compact city**; “I actually hope that the city will be more or less like it is now, really, I think its great [...] It doesn’t need to be a big city, we don’t need to have high-rise buildings” (Int. 3). An architect we spoke to said that his vision was to stop the spread of the city over the islands and up the valleys, to have a more compact and concentrated city centre:

“So in 1900 [...] there were 80,000 people living in [Bergen’s centre]. And now, 100 years later, in the same area, there are 40,000 people! [...] And the size of Bergen of course has grown from 80,000 to 280,000 people, but everyone lives everywhere else: in Åsane and so on. So my vision is to be able to recreate a city centre as it was: we have to have more people living in the centre. It will be painful in a lot of ways, because it means that you have to build in places where you don’t want to build, or you have to take away things that we are now used to like parking spaces... This process is painful but quite necessary” (Int. 12).

Another key concern for some (4) was that the city remain **a safe place to grow up**, without necessarily going into details on how to ensure that safety; “I think the biggest priority would be to adapt for safety, so that if sea levels are rising and we have more rain and more wind, Bergen is still a safe place to live” (Int. 4). Or as one NGO group leader said, I really think that a sustainable city must satisfy the individual's need to be seen and feel meaningful and safe and all this” (Int. 14).

4.2.2.4 A car-less city

Many respondents’ visions of Bergen were without cars, with **more emphasis on public transport, cycle-ways, and walkways**; “It’s a walking city, a cycle-city. And this



needs to be developed according to the city's needs, like we are doing now in Bergen with the network of walkways [...] And by sea, also by sea. I think we can start again to take boats to get around" (Int. 16). Another respondent echoed this sentiment, somewhat playfully, "I think in 100 years that Bergen will be the north's Venice, with canals and gondolers and so on, to get around after we've experienced massive sea-level rise" (Int. 11). One NGO leader voiced frustration at the use of cars, while recognising it's not easy for everyone to get out of their car:

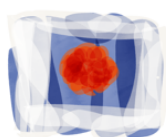
"So now I'm talking about light rail and buses and things, and that cars take a bit less place in the city. That there's more for people who can get out and move. But then I know, my mum, she has gout and is perhaps not in the best shape, and she says that it has to be possible for them to also use the city. And that's true, but for very many, very many can actually take the bus, or walk and cycle instead" (Int. 5).

Related to public transport was a desire, voiced by three respondents, for a faster train to Oslo, to reduce the dependence on planes; "If the train line was developed so that you could have, for example, a four hour train trip to Oslo. Then there would be fewer flights. It's possible" (Int. 13).

4.2.2.5 Norway's greenest city

"The city council's vision is that Bergen will be Norway's greenest city, and I think it's a good vision, because you can take it both concretely and generally" (Int. 6). The notion of a green city was important for five respondents, where green was voiced relative to the amount of **green space in and around the city**. As one NGO leader voiced her vision; "That there is some green space, since its been proven to be good psychologically and physically, because you're more likely to go out" (Int. 5). One respondent raised the trees on the mountains surrounding Bergen, a theme that arose in a few interviews, but not usually relative to people's vision:

"We do know about the relationship between trees, as you have out there [on the mountains], and the air around us and all that. It would be nice if we were more actively involved in more positive tree care, with trees that take up a large portion of the CO2



and other things like that, so that we can adjust climate change here. We see how the mountains were totally bare 100 years ago, and then they decided they should dress the mountain with trees, and they did so. Now there are getting to be too many trees, and the question is whether we shall cut them down” (Int. 1).

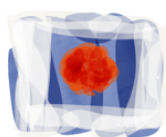
Two NGO respondents stressed that their vision of Bergen is one where Bergensers are more **concerned with their health and what they eat**; “are a bit smarter both about what we eat, and how we relate to the environment” (Int. 13). This was voiced in terms of vegetarian food by one respondent, who saw opportunities for growing our own food in the city: “Yes and maybe that there’s more done to help us grow things ourselves. That these green spaces can also be a place where you can [...] grow more food” (Int. 5)

4.2.2.6 Living under the rain

Linked to discussions on Bergensers ‘in-built resilience’, some (4) respondents Bergen’s residents will just need to **learn to live with a changing climate**, like they live with the rainfall today; “I think here in Bergen there is a very active consciousness about living with the weather conditions, and living with the natural environment” (Int. 10). A journalist gave an example; “My impression is that in [kindergarden], there are some places that are good at taking the kids out when it’s rainy and making sure that they are dressed for it and they know how to cope, but also having a little fun and experience with something that doesn’t necessarily have to be good or bad, but just a fact of life” (Int. 4). This same journalist sided more with embracing the weather that comes than taking actions to mitigate the impacts of this weather:

“A question would be of course: how much should one adapt for comfort? There’s been lots of talks and plans and ideas, like building roofs over Torgallmeningen or Strandgaten, to facilitate going around in the city centre and not getting wet. But I don’t think it’s necessary and it’s not the future as I see it” (Int. 4).

Other respondents talked about **physically designing the city to better live with the water**, ‘from the sea and from the sky’, rather than channelling it away as fast as



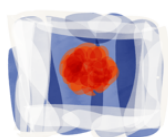
possible. Some of these design measures were small adjustments in the city centre, like installing glass roofs over outdoor spaces downtown, or increasing the number of public artworks, like sculptures and fountains, that interact with the rain. Others focussed on taking more drastic measures, like those working at a cultural heritage agency that discussed raising historic buildings by one metre in the face of sea-level rise, or changing plan zones to discourage building in flood-prone areas. Another measure proposed was to, “open up again some of the waterways that are now piped” (Int. 11). As a local government planner noted, “It is beautiful with water, and green spaces are very good for keeping water and drain water and avoiding flooding” (Int. 6).

A third way of living with the climate related to the **exciting new industries that Bergen should attract** in the future, including industries that are complimentary to the changing climate Bergen may face; “I try to think a bit international. So Bergen certainly has a lot of water, and other places in the world have little water, so there must be room for innovation there” (Int. 11). These industries ranged from tourism to green energy, with a film-maker summing up his vision:

“Ok I have a utopian vision for Bergen: with the resources from the sea, as food, power, electricity, Bergen could become a high-tech haven, particularly for marine resources and technology, like electrical power or being a battery power for Europe through water, wind and waves. Of course, if the weather gets rougher, and if climate change makes the weather more extreme - rougher storms and more water - then we can use that to make great electrical power. There will be innovations in how to convert forces into electrical power. They have already tried the tidal wave power plant in the 80s just outside Bergen, but it broke down in the first storm. But we already started to have wind power turbines for offshore, and it's just the beginning. So Bergen as a high-tech haven, that's my vision!” (Int. 9).

4.2.3 A 1.5-degree city: visions of Bergen in local government policy

While interviewees detailed a rich vision of Bergen under a new climate, anchored in things they love about the city now, local government climate policy has developed a



somewhat narrower (though not uncomplimentary) vision. The way they are written lends themselves to a back-casting scenario exercise because they often incorporate incremental steps towards their vision.

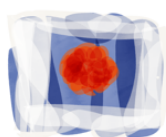
4.2.3.1 The Hordaland Climate Plan

The Climate Plan has a short, sharp vision; '*Hordaland on the way to being a low emissions society*'. To this vision it attaches three goals (Translated from original):

1. Emissions of climate gases in Hordaland shall be reduced by 22% by 2020 relative to 1991 levels, and by 40% by 2030 relative to 1991 levels. This means an annual reduction of 3.9% up to 2020, and from then on an annual reduction of 2.6% up until 2030.
2. Energy use in Hordaland shall be 20% more efficient by 2020, and 30% more efficient by 2030 relative to 2007. This will see an annual reduction in energy use of 2.2% up until 2020 and from then on annual reduction in energy use of 1.3% up until 2030. The energy requirement for all uses must to the greatest possible extent be provided by renewable energy, without the loss of natural diversity.
3. Climate adaptation shall be based on the precautionary principle, increasingly precise basic data and local knowledge.

The plan attaches most detail, and indeed most importance, to local climate mitigation, which appears to be largely framed as a technical and policy-led problem. It outlines quantitative milestones for reducing energy use and GHG emissions. This naturally translates to quite concrete measures for achieving these goals, through reducing car traffic for example. Many parts of this vision overlap with those of the interviewees.

By comparison, adaptation is left quite open, and treated largely as a knowledge deficit problem; if we can precisely predict how the climate will change, we can better adapt. Compare this with the interviewee's discussion of uncertainty, and existing capacities for living (and thriving) with whatever climatic change may come. Interviewees gave a much wider threshold for acting within the realms of uncertainty, compared to the



policy document which advocates for precise predictions, offering a very narrow space for manoeuvre.

4.2.3.2 The Green Strategy

The Green Strategy does not have a clearly outlined vision like the Climate Plan, but the preface does begin with the following, which concurs with the point made by the City Council policy-maker in 2.1.4 above:

"Bergen shall be a driving force for renewable energy and green, sustainable business. The City Government's ambition is for Bergen to become the greenest city in Norway."
(Pg. 3)

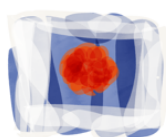
Later, in the introduction to the Strategy, it adds more detail to this vision:

"Bergen wishes to lead the way towards a sustainable planet and therefore introduces the concept of the 1.5-degree city by 2050. The goal is for the people of Bergen to limit their climate footprint in line with the UN agreement on climate change. In 2050, we will have succeeded in ensuring that the people of Bergen do not contribute more greenhouse gas emissions that the Earth can handle [...]"

The City of Bergen shall be a pioneering municipality in environmental friendliness, sustainable development and adaptation to climate change. Environmental considerations shall be the principle governing all activities and planning. Leading an environmentally friendly life shall be easy in Bergen." (Pg 8).

Here again, the focus is clearly on climate mitigation, by reducing the 'climate footprint' of the city in terms of GHG emissions. Adaptation is discussed much less explicitly. 'Green' in the green strategy seems to apply more to carbon neutrality than green areas or healthy lifestyles. Again, this draws a narrower vision for Bergen's future than the rich picture painted in the interviews, though some of the concrete goals for achieving this vision overlap with interviewees' aspirations (paraphrased from the Green Strategy preface):

- (i) new green urban policy tools and plans



Deliverable 1.3
Relevant excerpts from interviews and protocols

- (ii) better designed buildings
- (iii) removing toxic pollution from land and sea
- (iv) prioritising pedestrians, cyclists, buses and light rail over cars
- (v) electrifying the port
- (vi) opening walkways and cycle-ways
- (vii) recovery of waste and environmentally friendly waste management
- (viii) climate considerations in competitive tendering

But the Green Strategy does note that it is subsidiary to the **Municipal Master Plan**, which outlines a broader vision for Bergen that includes but goes beyond climate considerations (emphases in original):

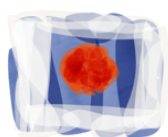
“Our vision for the future is an ACTIVE and ATTRACTIVE city. The City of Bergen will meet the challenges it faces in the period up until 2030 by developing a more compact, well-functioning city where people move more in their day-to-day lives.

The plan describes five key strategic areas for realising the vision of an active city: *pedestrian-friendly, forward-looking, green, committed and driving force in the region*. In addition, four key strategic areas are defined for realising the vision of an attractive city: *compact, diverse, safe and unique*”

The Master Plan shares further aspects of interviewees’ visions, notably a **compact city** that is **well-functioning and safe, pedestrian-friendly** and **green**. Between the Master Plan and the Green Strategy, a large portion of interviewees’ elements for a vision for Bergen is covered. Perhaps most obviously missing is any discussion of Bergensers’ identity and resilience, and any explicit discussion of living with the rain, or other weather, that may be brought about by climatic change.

4.2.3.3 Who is excluded by the policy framing

Following an ANT analysis, we can identify which actors and issues are included in the policy framing of climate change in Bergen, and by extension, which are excluded. The Hordaland Climate Plan’s emphasis on mitigating local emissions of GHGs frames climate as a technical problem; solvable by incrementally implementing clean

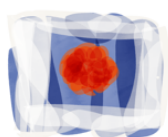


technologies toward reducing the local GHG 'budget'. While this potentially implicates all Bergensers, as car owners or owners of wood-burners for instance, it primarily implicates engineers and technologists and other experts in local government who 'roll out' these technologies and set up the incentive programmes for their uptake. The public are more passive receivers of these technologies. The objective on adaptation appears to give equal attention to science as other (local or traditional) knowledge systems, though in light of the other objectives this too seems to favour scientists in understanding the climatic changes Bergen is (and will) face. The Green Strategy too favours a mitigative framing of the climate change issue, with similar attention to technologies for reducing the local GHG budget. It is, however, connected to a wider set of municipality policy documents that connects the climate issue to other aspirations for the city; from active lifestyles, to green areas and a compact city. This broader framing therefore incorporates a wider network of actors and issues, as those discussed by interviewees.

4.3 Golfe du Morbihan (Charlotte da Cunha)

Due to its geographical settings, the future challenges of the Golfe du Morbihan are obviously related to climate change. The Golfe, its inhabitants and its economic activities will be exposed to increasing risks of storms, flooding, submersion, as well as coastline modifications (cumulative effect of submersion and sea level rise). But before all, the Golfe will suffer its territorial development choice. Present urban development, started in the years 1960-1980, mostly along the coast and based on secondary houses, influence social and economic development but also political choices.

Different narratives and framings of timescale and season have been interpreted in the Golfe du Morbihan, in deliverables D1.1. and D.1.2. The most efficient way to make the Golfe du Morbihan more climate proof will be multifaceted, as divergent future visions, preferences for adaptation options and other interventions are controversial. The



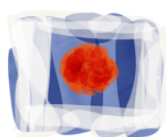
Natural Regional Park has been created in that sense and diverse local actors tries to express their point of view in the face of increasing coastal urbanization. In this context, needs for knowledge and climate services is essential for them and to help decision-makers to make more informed decisions. Consequently, we explore what insights do local narratives in Golfe du Morbihan offer to develop a resilient and desirable future under the influence of climate change, future that we will further investigate through an incremental scenario co-construction process (WP2)¹.

4.3.1 The Golfe du Morbihan as place - living place or working place, temporarily or permanently. How to manage the conflicting views of development?

Visions of the Golfe du Morbihan introduce tensions. As stated in the deliverables D1.1. and D.1.2, the Golfe du Morbihan modern historical narratives result from the development of tourism, mostly based on secondary homes. Tourism shapes a new territory, in terms of economic activities, land use planning and everyday life habits.

This development confronts the Golfe du Morbihan to two strongly overlapping use conflicts related to socio-economic and demographic profile of the people involved. First, the employment and living areas are limited overlapped. The secondary house expansion is mostly handled by retired coming from Rennes, Nantes and Paris, and therefore led to the rise of land price and an aging of the population. Due to lack of housing affordability for middle income, the local active population, which providing service to these aging people, retreat inland. Secondly, the population has a high average age and leads to a policy focused on people over 50 years. Retirees vote in favour of their specific needs and thus influence the territory towards an outstanding territory, if not pageantry, visually beautiful, but where there is not enough activity and

¹ This deliverable use, in addition to the exploratory interview exploited for D.1.1 and D.1., a second set of 20 interviews.



leisure for the families and the young people, where the schools close, where the economic activities are essentially turned to the service.

In addition to these use conflicts, many homeowners do not live there year-round and the home sales have a high turnover (sales every 7 years in average). This situation does not facilitate a balanced development of the territory, with residents who feel invaded during summer and secondary residents who do not invest themselves in local development. In these conditions, we can interrogate how the Golfe du Morbihan can become a place where people stay long, where the place attachment flourish.

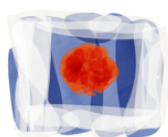
So, the inhabitants are not encouraged to invest their time (or their money) to develop ideas and activities, to plan for the future in the Golfe du Morbihan. This could explain the inconsiderate development of residential areas inside present or future flood risk areas. Some homes are already under the sea level, protected only by dikes and dunes, and are extremely vulnerable to sea level rise. Moreover, houses have caused inappropriate river management generating overflows during heavy rains.

Based on these insights on "What is at stake" in the Golf du Morbihan cases study (above) the following connecting points for discussions about desired futures pave the way to the next Work package (identification of hinge points in the scenarios design):

1. the level of place attachment and its role in the individuals and decision-makers decisions, 2. the risk perception of people and decision makers, who accept to build and live on risk areas; 3. the planning and development capacity with a temporary and aging population.

4.3.2 The Golfe du Morbihan as identity - a moving territory. How to continually redefine its sense of place? Which visions for the Golfe du Morbihan under a new climate?

Three elements play key roles in the local narratives on weather, water, and climate in the Golfe du Morbihan, making it as a moving territory. The seasons organize the territory timeline through an immutable cycle, with winter and autumn and his slowed



down life, versus summer and spring with his tourism. On a long term perspective, climate change will influence the coastline and affect a chronotope: the coastline pathway. The changes also impact iconic marine activities of the Golfe du Morbihan. Several issues arise from these three elements, issues that should be further explored and exposed during scenario co-construction process (WP2).

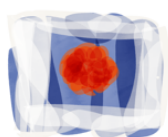
4.3.2.1 Winter versus summer

In winter, the Golfe du Morbihan is calm. Many houses and some shops (open in high season) are closed, leaving the impression, in some neighbourhoods, of ghost town. In summer, the population increases tenfold (between seven and seventeen times according to municipalities), leading to problems of congestion, use of recreational (mostly beaches) and commercial spaces and access to fresh water (for drinking, irrigation and oyster farming). This leads permanent residents to live two different lives in the same territory depending on the season, with a rejection feeling against these temporary inhabitants coming only during summer.

In these conditions, how to manage the needs for housing development in the Gulf and especially on the seafront to meet the needs of the incoming populations. They handle the legacy territorial land use planning but should find a balance way between development, prevention and conservation. The second set of interviews arise important questions to consider for scenarios design: What are the determining factors for decision-makers? What is important in management of the forthcoming risk? As the people are not installing over the long term, is there a question of place attachment that should be handled? How to address the issue of insurance and the nature of the damage covered by the guarantee when the government declared a state of natural emergency?

4.3.2.2 Moving coastal paths

As stated in D.1.2., the coastal path is a chronotope, undergoing erosion. The coastal path mainly corresponds to 3m right of way on private property along the shoreline. The erosion of the banks leads, by transition, to erode private land, forcing



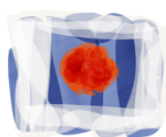
homeowners to move back their fence to leave the right of passage. These lands along the edge of the sea are in themselves symbolic of the movement of the territory. Traditionally, these lands were the least valuable as they are less fertile than those inland. These lands have increased in value with the development of resorts and tourism, lands that erode year after year. This has led to a landscape enclosure over modern times, and thus the need to create a coastal pathway (right of way) to regain its access for all.

4.3.2.2 Iconic marine activities

Alongside the issue of housing and urbanisation, the sustainability of marine economic activities, iconic of the Golfe, must be taken into account. As exposed in deliverable 1.2., the exploratory interviews enable us to expose lifetime experiences of climate change through the perspective of an oyster farmer, a salt worker and an organic farmer. These activities, iconic of the Golfe, are and will be impacted by climatic change, and respondents ask for climate information needs (seasonal and local temperature forecasts, long-term trends of summer rainfall, and future sea level and storms (frequency, intensity)). These economic activities, the custodian of that Golfe identity, raise concerns and uncertainties to solve and to take into account in planning process of visions for the Golfe du Morbihan.

4.3.3 Visions of the Golfe du Morbihan in local government policy: the ongoing PCAET

In April 2013 the European Commission adopted an EU strategy on adaptation to climate change, which aimed to make Europe more climate-resilient, by enhancing the preparedness and capacity of all governance levels to respond to the impacts of climate change. In line with this, the local adaptation planning in France was initially guided by top-down national regulations. The regulatory framework is a major factor influencing the adaptation agenda at a regional level. Climate planning has been compulsory in



France by the Loi Grenelle 2² for urban areas with population over 50,000, through the adoption of the legally mandatory Territorial Climate, Air and Energy Plans (PCAETs), mandatory by December 31, 2016.

The local decision makers (at municipalities and regional scales) have to respond in urgency to the national demand for territorial planning against the effect of future climate change. The Golfe du Morbihan-Vannes Agglomération is in the process of planning its PCAET. The work done in the framework of CoCliServ should be able to help this planning, with support of the scenarios process and, in particular, by providing climate services (WP3) relevant for public decision-makers. From the second set of interviews, we noted three main climate services: occurrence of extreme events, evolution of the coastline, and future demand for drinking water and consequence on deep water reservoir.

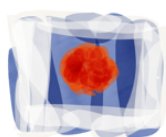
4.3.4 Who is involved in visions for the Golfe du Morbihan?

The first group of actors includes the 'official decision-makers' on climate adaptation. The municipalities around the Golfe du Morbihan and their aggregation structure (Golfe du Morbihan - Vannes agglomération) have to be included in workshop process (elected representatives and local officials). We should also established contact with the others institutional structure as Agricultural council (regional), Chamber of Commerce (regional), Loire-Brittany Basin Committee (watershed area) and local institutions managing public service activities (health care, schools, etc.).

The second group of actors and "things" involves local organizations and individuals in the neighbourhood, such as local residents, NGOs, places of cultural and artistic expression, and local initiatives such as the Court Circuit.

A final group involves people in a most inclusive way: primary and secondary house inhabitants, entrepreneur (including farmers), and tourists.

² Loi n°2010-788 du 12 juillet 2010 portant engagement national pour l'environnement

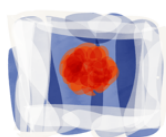


4.3.4 Further research and link with others Work Packages

We explored what insights do local narratives in Golfe du Morbihan offer to explore resilient and desirable futures under the influence of climate change. These insights are important for the incremental scenario co-construction process (WP2), the determination of relevant climate services (WP3) and the art–science conjoint analysis (WP4 - Task 4.4). These results from WP1 should also be reprocessed to support WP4 and WP5 analysis of data and meta-data.

The goal in the WP 2 activity of the Golfe du Morbihan case study is to co-design future visions and action scenarios (combining short-term action and long-term strategic plans) for a climate resilient neighbourhood with local actors. These activities provide the opportunity to include local decision-maker (elected representatives and local officials from Golfe du Morbihan municipalities) and other local actors (such as architects, artists and journalists) to this collaboration in order to bring new ideas and visions to this core science-policy network.

WP1 insights highlight need to further inquire risk perceptions of inhabitants, and, in the context of participatory action research, start the art–science conjoint analysis (WP4 - Task 4.4). Art and science co-construction process will allow us to put forward the experiment, the sensitive, the empiricism. The ambition is to understand where the denial comes from and, to make people aware of the flood risks they are subject to. It will be necessary to make visible the past-present-future relation, the conditions of life, for a better perception and acceptance. This artistic work related to scenarios process will take place in summer (peak season), to reach a large set of actors (primary and secondary houses inhabitants and tourists not selected in advance). We wish to develop an artistic work on the coastal pathway, through one or more physical and visual objects that can stand outside without supervision. These objects will go together with an event at one point of the coastal pathway to explain the artwork and conduct a questionnaire survey about it and the Golfe du Morbihan changes.

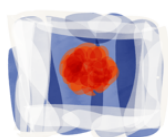


4.5 Case study: Jade Bay (Werner Krauß)

4.5.1 What is at stake?

How does a climate friendly landscape look like, and how will it come into being? In this case study, both questions are closely intertwined. The extreme landscape of the German North Sea coast, with its many reported extreme weather events, is always threatened by rising sea level, by storm flood or too much water in the hinterland – all the elements that also define the changes brought by climate change. The infrastructures of drainage systems and coastal protection are deeply rooted in the social organization of this landscape; each change in these systems also means societal changes. From this perspective, climate change is as much a technical as it is an intellectual problem (Krauß 2015); it is a material and a semiotic problem, and it is a problem of democracy.

‘Climate friendly’ serves here as an extension of the more technical term ‘climate protection’ (Klimaschutz), including and transcending the technical understanding of mitigation and adaptation. I chose this synonym, because climate protection plans are already established or are under discussion, but in the restricted sense of institutionalised governance strategies. My main goal here is to extend the meaning of climate change and climate protection, as a result from my open interviews, everyday conversations and participant observation. What exactly do people subsume under the term climate change; in which contexts do climate issues appear, what kind of problems are associated with it, and how do desired futures look like? As outlined in deliverables 1 and 2 (Krauß et al 2018a and 2018b), extreme changes in weather and resulting changes in the landscape are not only part of stories about anticipated catastrophic futures (catachronism) – but they also have happened already in the past, with disastrous ‘apocalyptic’ storm floods. These floods are remembered in various ways, with the exhibitions in honour of the 1717 flood, as landmark in the maintenance of the second dike lines which also indicate where the sea has formerly ended; or in the form of landmarks and placards at houses which indicate former flood events



(chronotopes). The North Sea is considered as dangerous, as '*der Blanke Hans*', the stormy and murderous sea, as well as the drainage infrastructures are part and parcel of the everyday landscape. 'This is what we learned in school', an elderly lady stated in a discussion, 'God created the sea, and the Frisians created the coast', 'we Friesians fight against the sea, this is our identity'.

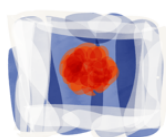
In this inquiry, I intended to focus on how climate change and its effects as well as desired futures are conceptualized against this narrative background, or, to put it in terms of eco-criticism against the semiotic-material construction of this coastal landscape. The task is not (only) to raise awareness, but to figure out the way in which the effects of climate change are considered as dangerous. How does a climate friendly landscape look like, and how will it be achieved? The desired future as imagination and practice immediately raises the question of ownership, of infrastructure, of identity, and of decision-making.

The following protocols and excerpts are mostly derived from

- protocols of an event in December 2018 in Wilhelmshaven, where the *Oldenburgische Landschaft* organized a public discussion with the title: "the Oldenburger Land in the year 2050 under special consideration of climate change";
- from protocols and interviews conducted in 2018
- from media publications
- from public discussions about wind energy, energy concepts, the Wilhelmshaven event etc.

4.5.2 Agriculture

During my field research from November of 2017 until September 2018, weather and the seasons were discussed in terms of climate change. The winter was unusually wet; there were lots of rain, extreme rainfalls, and the fields and meadows were underwater most of the time. The farmers could not bring out the manure in September and October, the deep marsh soil was too wet for the tractors. The sky was almost



Deliverable 1.3

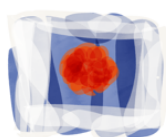
Relevant excerpts from interviews and protocols

constantly grey, there was hardly any sun. One farmer told me that there is too much humidity in the air; it needs cold temperatures to have blue skies in the winter, but there were hardly any freezing temperatures. In conversations, people told me stories about ice skating on the frozen dumps and small rivers; something that their own children hardly know, they said.

In almost all conversations about the winter 2017 / 2018, my interviewees attributed the extreme weather to climate change, as did the regional and national media.

An unusual warm and long spring and summer followed the wet winter, which turned into a severe drought. Fields and meadows turned brown, and farmers missed one or even two hay harvests and had to buy additional fodder. Prices were raised due to the enormous demand, and many farmers had to sell cattle prematurely (telephone interviews). Again, this extreme summer was discussed as an effect of climate change. While tourists and many coastal dwellers enjoyed the endless summer and the unusual warm, nonetheless mostly agreeable temperatures, it was agriculture that suffered mostly. The situation of the farmers became an issue of national interest and of extensive media reporting.

In the media, agriculture was discussed critically in respect to climate change. In February, when everything seemed to get drowned, the *Süddeutsche Zeitung* wrote: "Endangered agriculture. Since months, the North suffers from wet fields, with loss of harvests as a consequence. But the problem is homemade: Intensive agriculture has sealed the soil in such a way that rain can't flow anywhere anymore" (SZ 20/2/2018). In several articles, the term 'Standort bezogen', site-specific, is a central postulation. The *Hamburger Abendblatt* discusses the role of agriculture as a producer of greenhouse gas emissions and demands that farmers should contribute to climate protection (HA 16/03/2018). During drought, several articles discuss monocultural versus mixed farming, and organic farming versus industrial farming. *Die Süddeutsche Zeitung* writes that 'Europe stinks', with respects to nitrates that pollute drinking water and to mass



Deliverable 1.3

Relevant excerpts from interviews and protocols

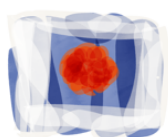
meat production (SZ 09/08/2018). In many articles, the European subsidy system for agriculture is critically discussed; site-specific production should be more subsidised.

As usual, there were calls by the agricultural lobby for compensation for the losses due to the extreme weather periods. Surprisingly, politics did not follow suite; compensations were granted, but not immediately. Instead, politics and media discussed vulnerability and resilience of the diverse forms of agricultural production.

A long discussion with three farmers at the occasion of a get-together of the dike association, reflected these discussions. While they linked extreme seasonal weather in winter and summer to climate change, the real issue at stake in the discussion were the economic restrictions imposed by the European Union agrarian market and the national politics. Farmers depend very much on political decisions, on rules imposed by politics. The fall of the European milk quota forced many dairy farmers to give up or to buy more land and more cattle; European subsidies make up to 40% of the income. To my surprise, the difference between conventional and organic farming practices were not discussed in ideological terms, but in financial terms and in respect of resilience to changing weather conditions. Furthermore, the production of renewable energies changed agriculture considerably; land became more expensive, and especially the implementation of biogas changed agricultural production – producing corn for biogas – as well as land possession and availability.

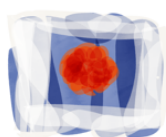
All farmers I talked to highlighted the role of inheritance as one of the main reasons for their activities. They all inherited the farms from their predecessors, some already in the fifth or sixth generation, and they all want to pass on a viable agricultural production. In order to do so, they have to make permanent investments into the future, and they have to calculate the vagaries of the weather, the market, politics and technological developments. If there is a common denominator or vision of the future, the possibility of inheriting a viable farm to the next generation might be a candidate.

4.5.3 Future of water management



(protocol excerpt, administrator of Lower Saxony Water Management, Coastal Defense and Nature Conservation Agency (NLWKN)):

According to their definition, water management is both coastal protection and water passability, with the latter meaning that the water from the rainfall has to be transferred to the sea, which is protected by the uninterrupted line of dikes. Climate change means a challenge to high-water defense and drainage. In fact, as a water manager explains, drainage of the land is considered as one of the main challenges. She explains that adaptation means nothing new for coastal inhabitants, with morphology, hydrology and land reclaiming as the main processes. There are the flowing waters of the marshes, the mudflats, and of the Geest, the mainland; there are the main sluices of the Maade, Dangast and Varel. The main problem is that the land behind the dikes is below sea level, and thus it gets more difficult to bring the water out. This is mostly due to the lowering of the land, which is no longer supported by the sediments brought with the flood – one of the effects of building dikes. Furthermore, the soil is compacted due to continuous drainage. Here is where the possible effects of climate change come in: more extreme rainfalls are expected, there is a constant rise of sea level, even though the IPCC, which serves as main source of information, shows a high level of uncertainty about the rise to be expected. Both changes in the water level outside the dike and the water level in the hinterland, regulated via the drainage system, have a tendency towards extremes; the wet winter and the dry summer of 2017 / 2018 serve as an example, resulting in extreme groundwater fluctuation. There are measures necessary to avoid that “the shoes beneath the bed start swimming”, and the challenge of the future is to bring out the water from the rainfalls in a climate neutral way, while providing simultaneously holding reservoirs to manage the fluctuations. In the discussion, a member of a nature conservation suggested that in the future, the additional water from extreme rainfalls should be used for household and industry instead of being pumped into the sea.



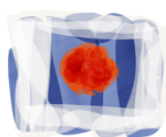
4.5.4 Future of coastal protection

(protocol; scientist, climate impact research):

The main challenge for coastal protection is sea level rise; the mudflats and salt meadows cannot grow accordingly, due to the existence of the dikes. Thus, there are only two solutions: help out with sand replenishments or else to heighten the dikes respectively, both processes already under way. One of the main problems is that especially in the Eastern part of the Jade Bay, the carrying capacity of the land has already reached its limits. As I already learned when participating in the dike inspection, the second line of dikes is getting more important. These old dikes were long neglected, but with the threat of more extreme or intense storm floods as expected effects of climate change, their maintenance gains increasing relevance. In any case, various projects have been launched to envision alternatives for the future.

One of the main ideas is to get away from linear dike protection to a graduate system of protection. This vision is based on the idea that parts of the land could be re-delegated to become natural landscape, which are flooded by the tides and are open for touristic use, while other parts are maintained for agriculture and energy processing. Houses could be built on dwelling mounds, like in former times. This idea, which is raised all along the North Sea coast by coastal researchers, was seen critically by the discussants. The Jade Bay is completely contained by dike, and for most people it is beyond imagination that the dikes might be opened up. On the other hand, there were already in the 1930ies visions of closing the mouth of the Jade Bay and turn it into a sports place. This ironic depiction was the motif for the discussion event and somehow contradicted the confirmation of most coastal dwellers that dikes are unchangeable.

A further problem is to balance the tidal waters which influence the sea water-level and the mostly artificial and technologically regulated water-level on the landside. The electric water pumps need more power to lift the water on sea level; the capacities of the water reservoirs have to be extended, and there have to be built special polders as



a substitute. What is needed, he says, is a combination of re-watering the land and of temporary storage of water in the reservoirs in order to minimize possible damages.

4.5.5 Energy futures

(Protocol of a talk of the administrator of the department for land development (Dezernat für Landesentwicklung))

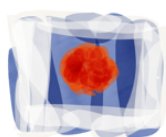
To envision the future, the administrator first reflects on the past. Energy is his issue for more than 20 years. Wind energy started 25 years ago. 15 years ago, regulation of renewable energy production started – this was the end of the *Verspargelung* – “asparagusisation”, which means one wind turbine on a farm instead of wind parks. 2011, Fukushima caused Germany’s the exit from nuclear energy; taxation of renewables, with taxes directed to the sites of energy production.

Ever since, he said, “it is enough. The landscape is saturated with turbines.”

The same is true for biogas, which led to corn monocultures.

Off-shore started 20 years ago; problems with bringing energy on land, with cables through the National Park. There is still huge potential.

On land, the current level will be maintained, the only changes will come with re-powering. One major change will be the transformation of energy into gas, which can be stored in caverns – caverns which are already used to store oil, in Wilhelmshaven, for example. The production of biogas energy, on the other hand, will be reduced. Anyway, the abundance of renewable energy production will be maintained and is one of the main advantages of the region, which serves as the basis for a strong vision: In 2050, huge companies like Google will come to the region because of this energy abundance; they need ever more energy for the storage of data. The region could also attract the energy intensive in vitro production of meat, for example. The only price to pay is the further industrialization of the landscape, which is, in fact, already an engineered landscape. The region will become more independent and prosperous, in case it decides to become so. It will be energy independent and even sell energy into



a transnational energy network. In any case, digitalization will play an important role in distributing energy and reduce consumption.

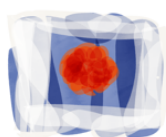
These are only a few examples for possible energy futures. The future depends, says the energy manager, on which future we decide upon. The potential is huge, the potential to change everything – the landscape, the form of energy production, the ways to earn money.

4.5.6. The future of the National Park and UNESCO World Heritage Site

According to the director of the National Park, the Wadden Sea does reinvent itself every other day; this is the basis for the bio diversity of the salt marshes, which in turn serve as a resting place for millions of migratory birds. There are already unmistakable signs of climate change: seal pups are born four weeks earlier; some geese stay longer, because the quality of the resting places increased and the routes of the birds change accordingly.

One of the main problems for the world heritage site is the so-called Wadden Sea squeeze: because of the restriction imposed by the dike line, the salt meadows of the Wadden Sea cannot “grow” accordingly to the rise of the sea level; as a consequence, the salt meadows might disappear, sooner or later. This would lead to an enormous loss of bio diversity and endanger the spectacular success of nature protection in the last decades.

One of the main challenges is that keeping up the slogan “let nature be nature” means taking decision to protect nature accordingly. The National Park director reminds that in the thirties, there were plans to turn the Jade Bay into a sports place – there would be no problem to close the Jade Bay at the mouth to the North Sea. But the National Park is world heritage, and it is Heimat, a home for the people who live there. This is why he suggests to declare the Wadden region as an UNESCO biosphere reservation, where people are closely linked to their Heimat, where regional products will be sold and so on. Even though he is fully aware that there will be resistance against extending nature protection landwards. This hunch proved to be true: in February 2019, the



municipality of Varel refuses even to talk with the National Park about declaring Varel and surroundings as a biosphere reservation. In a discussion in the municipality, the UNESCO world heritage and National Park were severely criticized and not considered as trustworthy by a majority of the municipal councilor.

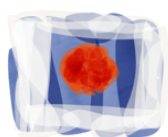
4.5.7 Environment and Planning

(protocol excerpts of interview with head of building and environment, Jever). The head of building and planning shows two aerial photos, one of a town near Jever, and one of a town in Texas, USA. There is no difference concerning the dynamics of urban sprawl. The German town in the drainage area spreads in concentric circles. Municipalities sell their land or declare zones for building activities in order to attract new residents. The banks are partners in this business and provide the money for house constructing. In 80% of the houses, the head of the department explains, there live only one or two persons; children mostly leave after 16 or 20 years. He considers urban sprawl a huge environmental and climatic problem; the sealing of the soil, the outer walls, the energy necessary and the extra push for automobility which is needed to reach the basic infrastructures like work places, supermarkets and schools all contribute to this problem.

He and his department already took measures towards the implementation of an alternative future: they built inside the capital of Friesland, Jever, several building blocks with large apartments, where people can live comfortably and even do not need a car, with all infrastructures available. If there was a political decision to follow this path of answering the demographic pressure in this way, the landscape could be used for more agriculture, as a carbon sink and as a landscape for the people and to safeguard biodiversity. Unfortunately, he says, all political infrastructures, the banks and the municipalities still keep the shallow dream of a house in the countryside alive, for their own profit.

4.5.8 Future of tourism

(protocol and documentation of an ongoing conflict)



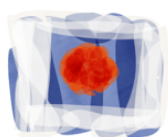
Deliverable 1.3

Relevant excerpts from interviews and protocols

Dangast is the oldest seaside resort in Germany. Located on the *Geest*, the Dangast peninsula is the only access to the sea not restricted by a dike. The village has a long tradition in hosting artists, among them Franz Radziwill (1895-1983), whose former house today is a museum. Dangast belongs to Varel, and in recent years, it had a negative household mostly due to the costs of maintain a public swimming bath. The council of Varel decided to implement a restructuration manager, and as consequence, public ground with the former *Kurpark* and *Kurhalle* was sold to an investor who built there a dozen of apartment houses for tourism. Local inhabitants protested against the implementation of this tourist resort, which they consider as an assault on the local culture and local visions of Dangast as a tourist resort defined by art, local culture and love of nature. They organized in a local citizens initiative, which still exists and gained considerable media attention – even though they could not stop the implementation of the tourist resort. Regional and national newspapers reported about the conflict, with Dangast now dubbed as “The divided village”.

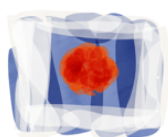
The tourist resort is protected by dikes, and the investor managed to get a special temporal license to build as close as possible to the dike. The citizens initiative is still active; they attend the meetings of the councils, they deliver protest notes, and they monitor the activities of the investors. There is an obvious conflict constellation between a neoliberal agenda – reduce the costs of the household at any prize – and a “cultural” agenda which promotes a sense of belonging which they consider appropriate for Dangast.

Climate change plays a role in physical terms: this part of the coast is considered as especially vulnerable to incoming storm floods. But it also plays a role in a more metaphorical or symbolic way: the strict “restructuration” of the household is considered as threat to the social climate. In actual practice, this conflict narrows down to the question of “how do we want to live?” and “who decides how we live”.



4.5.9 Future of Climate Politics: who and what should be involved?

In interviews and at the occasion of public events, in the municipal sessions or at the kitchen table, all of the above climate-related, place-based issues are discussed. Officials – administrators, politicians, wind energy advocates, but also NGO members – often complain that the “good ideas” are difficult to implement because of the resistance of ordinary people, who do not want to leave their comfort zone and their NIMBY attitude. Climate discourse is permanently fuelled by science-based media communication strategies. They rest mostly on two assumptions: 1) the ‘theory’ of the *homo oeconomicus*, which says that people are mostly self-interested and only change when it improves their financial situation and security; 2) people are greedy, but they are also sentimental. This is why climate protection strategies as well as the campaign for the biosphere reservation promote a sense of belonging, of regionality, of “*Heimat*”, as it is called in Germany. These assumptions of the greedy / sentimental NIMBY citizen are widely shared, even among citizens themselves. But once the top-down governance strategies are ignored, and discussions focus on everyday experiences and on regional history, a different picture emerges. Around the Jade Bay, there live many pioneers of wind and solar energy, of biological farming or of nature conservation. It is often forgotten that without the civic engagement of ordinary citizens, government and science still would put their bets on nuclear energy, on industrialised agriculture, and on the idea of permanent progress. Participant observation provides many occasions where people act selflessly and care about other people, their children or parents, about animals and plants, about consumption and migrants. More often than not, climate change and nature conservation are experienced as top-down governance strategies; farmers complain that the EU still pays subsidies for quantity and not for quality; there is no lobby for the unintended consequences of biogas and wind energy production in terms of land use and ownership, and how is it possible that neoliberal policies can divide coastal towns? In short, climate change politics has a democracy problem. There is a huge lack in providing climate friendly infrastructures, and there is



a lack in democracy. It is still unclear what climate change democracy might look like; this is a task for the co-development of place-based climate services for action.

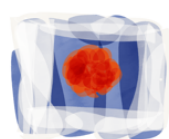
4.6. Kerourien (Juan Baztan and Lionel Jaffrès, edited by Bethany Jorgensen)

Kerourien is in a peri-urban context in the Saint-Pierre quarter of Brest, France. According to the 2013 census, Kerourien has 1200 residents. It is a priority area, mostly structured around post-war housing projects, with a strong “social inclusion” focus. Kerourien is one of the most diverse areas in the city and the most challenged in terms of urbanization, migration, and empowerment.

4.6.1 Primary and Secondary Sources

At this stage of WP1 all data related to the narratives are available digitally or in hard copy. Our primary sources are the data generated through the CoCliServ process that the CoCliServ team was directly involved in producing. The secondary sources are those data produced without direct connection to CoCliServ or those derived from production processes that did not explicitly involve the CoCliServ team but were still connected to the shared CoCliServ effort in the neighbourhood.

Primary or Secondary Source	Type	Number of items	Reference Code
Primary	Audio interview	15	AI
Primary	Video interview	7	VI
Primary	Workshop	1	W
Primary	Art Form	3	AF
Primary	Meeting minutes	10	MN
Secondary	Unpublished no PR papers	3	UNPRP
Secondary	Published no PR papers	302	PNPRP



Deliverable 1.3

Relevant excerpts from interviews and protocols

Secondary	Published PR papers	2	PPRP
Secondary	Published Rapports and books	7	PR
Secondary	Selected Press Releases	25	SPR
Secondary	Films	2	F
Secondary	Songs	16	S
Secondary	Official Pictures	5	OP
Secondary	Inhabitants Selected Pictures	25	ISP
Primary	Project Selected Pictures	25	PSP

Table 4: Available data for in-depth analysis of interview excerpts and protocols, updated from D1.2 version.

Data acquisition followed the protocols outlined in the following section.

4.6.2 Protocols for data collection and analysis

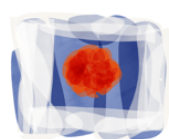
Three protocols were developed locally in Kerourien, Brest, France for CoCliServ to collect and analyse narratives of changing local weather and climate conditions from community actors with various levels of agency.

Data acquisition followed two main protocols. For secondary sources we conducted desk-based work driven predominantly by a trust-based snowball sampling process where stakeholders and non-organized civil society members shared documents they consider fundamental to feeding the collaborative construction process. Such documents include: personal photographs, drawings, and recorded songs collected through on-site participant observations. Analysing this part of the corpus through an approach rooted in modified grounded theory, interdisciplinary studies and participant observation helped us begin to identify community priorities and the gaps to be filled through the interviews and focus groups. Additional interviews and focus groups are being conducted with residents and other key participants. The fifteen interviews already conducted (see table 4) were based on the following questions:

Where were you born?

What path/road did you take before arriving at Kerourien?

Can you tell the first time you came to Kerourien? What was your feeling?



Deliverable 1.3

Relevant excerpts from interviews and protocols

Tell us three events in Kerourien that have been important to you (personally).

What is your feeling when you look at Kerourien today?

Can you describe three dreams that you have for Kerourien for 2050 (in 30 years)?

What would it take to make them come true?

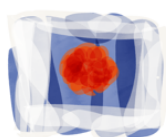
Do you have anything to add?

At one point of the process we identified a dispersion between the preliminary actions related to the ongoing efforts for Kerourien's 50th anniversary celebration, which we attribute to structural constraints and inertias ranging from the individual to collective levels (REF). As the group's defined goal is a collective one, one workshop had the aim of illuminating all the ongoing initiatives in order to: (i) reshape the collective goal and (ii) empower each individual's actions based on the principle that when each individual is stronger the collective action is empowered and grows from the addition of individualities.

As described in detail in D1.2, we organized a day dedicated to the "archives and testimonies" where each stakeholder presented their tools, findings and intentions to go further into the process. The day allowed us to clarify ongoing efforts, improve our understandings of each other, and identify common goals. This caused a shift in the dynamics and opened the transition to a collective process with a collective intention.

The shared elements and those that emerged during the workshop allowed us to establish the baseline for a collective process related to narratives and to illustrate the necessary conditions for reaching a robust common starting point. Based on the efforts from the last 12 months, we now have the necessary elements and local conditions to conduct in-depth analysis of the available material. Additionally, the other ongoing processes have much more solid ground to build upon.

From the more than 400 different media collected, two general source categories were identified : (i) media from local, regional, or national administration perspectives that are disconnected from the local community's values and priorities in their everyday lives; (ii) media stemming from people participating in identity-building efforts of the neighbourhood. The latter serve as powerful tools for emancipation and empowerment



Deliverable 1.3

Relevant excerpts from interviews and protocols

by taking risks and prioritizing diversity in ways that connect people with each other and with their differences in processes that ultimately bring them closer together and help them compose a world of shared values, of meaningful community (hooks, 1994). The film "Des graines sur le béton", 2006; and the book "d'une rue à l'autre... couleur quartier", 2003, are examples of this.

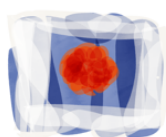
Media on climate change and associated climatic services are available to Kerourien's residents through sources from these two categories. Our role, as we were invited to Kerourien and are participating in the forum, is to connect elements that may not at first seem to be explicitly connected and by doing so offer insights to help form common understanding of the past, present and future stakes, validated by local community members and those working at municipal and regional governance levels, to improve the situation with a common baseline for future steps such as the scenario exercise and locally implementing emerged visions.

For the analysis of the collected data, we are using modified grounded theory (Strauss and Corbin, 1997; McCreddie and Payne, 2010; Charmaz, 2006). We base our exchanges with each other on a participant observation / observant participant mentality, as we do with all other stakeholders, which allows us to be full participants in the participatory process and contributes to creating mutual trust.

From the final analysis, three code families emerged and were validated during the June 25th Workshop. These were further developed through the analysis process and progressively extended engagement with the wider community, including the process the art forms played in feeding the symbolism of the collective history.

The three code families include: (A) levels of time-scales for representations of (B) climate and (C) weather in Kerourien. From here we conducted the in-depth analysis that allowed the relevant excerpts to emerge.

The final analysis of available data allowed us to validated the three code families. Five codes emerged and are stabilized and validated in the final analysis: explicitly evoked; implicitly evoked; government representations; community representations; and



individual representation. These codes are further classified by whether they refer to narratives of the past, present, or future (Table 5).

To connect this with the art forms we identified ex-post a seven-step workflow to translate the analytic efforts into the public presentation of three art forms responding to the same protocol baseline but unique for each artistic form.

The theoretical framework for the art+science forms is rooted in participatory observation, performativity and popular education. These three anchors stabilize a hybrid protocol baseline rooted in sources from both arts and sciences. The seven steps are:

- . Discovery of the perimeter of the question by the local core team.
- . Link the identified question with each artist and from there establish an artistic choice.
- . Establish the dynamics with the local stakeholders and inhabitants engaged in the artistic process.
- . Regular meetings to develop the artistic form.
- . Public representation.
- . Document the processes and final forms.
- . The day after, engage the question: how to grow into a long-term creative process and how to build next steps from there.

4.6.3 Final analysis and quotes: Chronotopes and more

The concept of “Chronotope” emerged in the ongoing Kerourien CoCliServ efforts as a key synthesis concept. In Kerourien a Chronotope appears as:

“Sense of place. Sense of time.

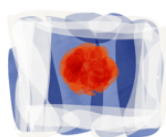
Intertwining to exist plenty.

Belonging to a place and its time.

With the challenge of integration for all components of Nature.”

The Cronotope is an interesting new concept for a place, Kerourien, actively reshaping its future.

The two salient chronotopes remaining from the past and still active today are (i) the Water Tower and (ii) the central bunker in Kerzudal park. Both concentrate a piece of the history of the city and the neighbourhood and draw what sense they make from the place they are associated with and the time they accumulate. With its construction in 1930, the water tower allowed a shift in hygiene conditions that ended the smallpox,

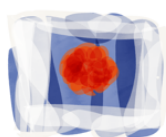


cholera and typhoid epidemics at the beginning of the past century. Then, through its role of water tank, it has been essential during periods of water scarcity, such as the one in 1976 or current summer weather alerts. Through its ongoing repair work, its symbolic and practical roles remain anchored in the present of Kerourien. The role of the bunker and its associated history brings a new element as a chronotope; that of when one remains, adopted by the present reality of the place and its inhabitants, allowing the integration of "*what we do not want here any more*" into daily life. This is the main role of the bunker in its chronotope reality.



Figure 1: The three art icons as shown in the 50th anniversary program.

Other chronotopes here are ephemeral ones. They impact reality for the time they are there, then they fade, leaving activity to those who had the chance to co-occur with them. Salient examples of this type of chronotope can be seen in the three artistic forms conducted by professional artists during the 50th Anniversary in October 2018 (figure below).



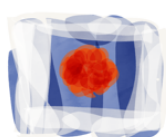
Deliverable 1.3
Relevant excerpts from interviews and protocols



Figure 2: Picture from the three art forms during the 50th anniversary celebration.

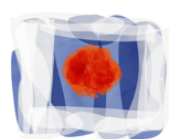
Throughout the process residents were progressively associated and engaged. During the play and/or performance they participated in the existence of a chronotope deeply charged with symbolism, which will feed the forthcoming collective history.

The interview excerpts below emerged from the in-depth analysis rooted in the chronotope concept and using the code families and associated codes looking at narrative temporality through the lenses of (A) **time-scales for representations of** (B) **climate** and (C) **weather** in Kerourien.



Deliverable 1.3
Relevant excerpts from interviews and protocols

A	Time-scale		
	Past	Present	Future
Individual representations	<i>"I was here in 68' at the very beginning of the neighbourhood." S_I_1</i>	<i>"At 5am I wake up to go to a low income job; the staggered-schedule life is not easy." S_M_1</i> <i>"In my place, there, it's really hard. I came here from very far to search for a little sun in my life." S_M_1</i>	<i>"Hard to follow a path that is not mapped." S_P_O_1</i> <i>"I want to travel, a real trip." S_P_O_1</i>
Community K representations	<i>"Our neighbourhood committee, then the book, the film; back in that time we were stronger." S_P_O_1</i>	<i>"From one day to another, from tower to tower, we live from day to day." S_M_1</i>	<i>"Never fucked, you lift your head up." S_M_1</i> <i>"We are dreaming of the next 50 years." S_P_O_1</i>
Government representations	<i>"The first plans were shared in 1964 and the towers were planned to last 30 years."</i>	<i>"We manage the emergencies, we do not have the resources to afford all the work that needs to be done." P_O_1</i>	<i>"Who knows where those towers will be in 10 years." S_I_1</i>
B	Climate		
	Past	Present	Future
Individual representations	<i>"300 years of tide gauge data." S_T_1</i>	<i>"It is important, the climate; look at how the window flaps are degrading." S_I_1</i>	<i>"Your skills are important for us, useful to tell them to do something." S_I_1</i>
Community K representations	<i>"Climatic conditions influenced the progression of epidemics. So between 1685 and 1729, the region was subject to a phenomenon of mini-glaciation, resulting in harsh winters, rotten summers and bad harvests." S_LP_1</i>	<i>"The social climate is complex and tricky in this neighbourhood." S_I_1</i>	<i>"The uncertainties facing the future bring a deep feeling of distress."</i>
Government representations	<i>"The balance of regional greenhouse gas emissions is dominated by agriculture, which represents 40%." S_GR_1</i>	<i>"Computing power and scientific knowledge evolve quickly ... New climate simulations are available." S_GR_1</i>	<i>"Despite the expected GW, Brittany will remain potentially exposed to a sudden cold snap like that of January 1985 with implications for over-consumption." S_GR_1</i> <i>"Fisheries and forestry will be the most impacted sectors and sea-level rise and storms the most outstanding factors." S_GR_1</i>
C	Weather		
	Past	Present	Future



Deliverable 1.3

Relevant excerpts from interviews and protocols

Individual representations	<i>"Strange such a hot and dry summer; it was not like this before." S_P_O_1</i>	<i>"Shit, it's always raining here." S_P_O_1 "So nice when the weather is so sunny like today." S_P_O_1</i>	<i>"In my place the weather is perfect and it will be." S_P_O_1</i>
Community K representations	<i>"Climatic conditions also influenced the progression of epidemics. Between 1685 and 1729, the region was subject to a phenomenon of mini-glaciation, resulting in harsh winters, rotten summers and bad harvests." S_LP_1</i>	<i>"In the flat Brest country, through the storm, the rain or the smog, the sun in the heart warms up this cold." S_M_1</i>	No clear examples available.
Government representations	<i>"Extreme events: Storms (Dec, 1999; July, 1969; Oct. , 1987) Marine Inundations: (Jan, 1924; Jan, 1978; March, 2008) Floods (1936, 1974, 1995, 1999, 2000, 2001 ... 2010 ...) Droughts and heat waves: (1953, 1976, 1989, 2003 ... 2011/2012) Snow: (Feb 1983, Feb 2004, Jan 2010 and Dec 2010) Cold Snaps: (1987, 1996/97 and Feb 2012 ...)." S_GR_1</i>	<i>"Faced with a drought as harsh as that of 1976, Brittany would be better armed today. Since then, new dams have been constructed and interconnected through distribution networks. But this situation remains relatively fragile." S_P_1</i>	<i>"Big uncertainty about the rains: no clear scenario but drought during summers. No evidence on the evolution of the other parameters (storms, thunderstorms, average wind, sun, snow ...) but these questions can be studied with the help of climate models..." S_GR_1</i>

Table 5: Rooted in D1.2, the updated and final version above shows selected examples from the 3 code families and assoc. 3 codes, by narrative temporality from the three levels of (A) time-scales for representations of (B) climate and (C) weather in Kerourien.

Trillions of chronotopes are created, at very different scales and with very different implications. This point will be developed through WP2 and WP4. Some complementary quotes to introduce the conclusive narrative lines include:

"Astonishing to see a show of this magnitude in Kerourien" (during K50, a city public servant).

"...what I need is a job, any job, just a job..." (during K50, a volunteer strongly engaged exhausted at the end of the effort).

"...do you need another project? Because I do need one more project..." (during the Dordrech meeting, a CoCLiServ partner sharing a deep need).

In conclusion, at this stage we rephrase the above quotes to shape four main narrative lines under exploration in WP2, WP3, WP4 and WP5:

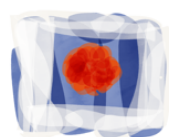
N_K_1: Social justice related with climate change and local weather.

N_K_2: Migrations and their associated consequences at each unbalanced step.

N_K_3: Housing and urbanization in a changing climate context.

N_K_4: Questions related to how gender weaves into the above narrative lines.

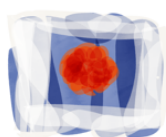
These narrative lines form the baseline for the coming steps in Kerourien, Brest, France, particularly for WP2, WP3 and WP4, where we connect the main identified narrative



lines with available scientific knowledge to find the best fit with community values for implementing robust, pertinent and salient climatic services.

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Deliverable 1.3

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