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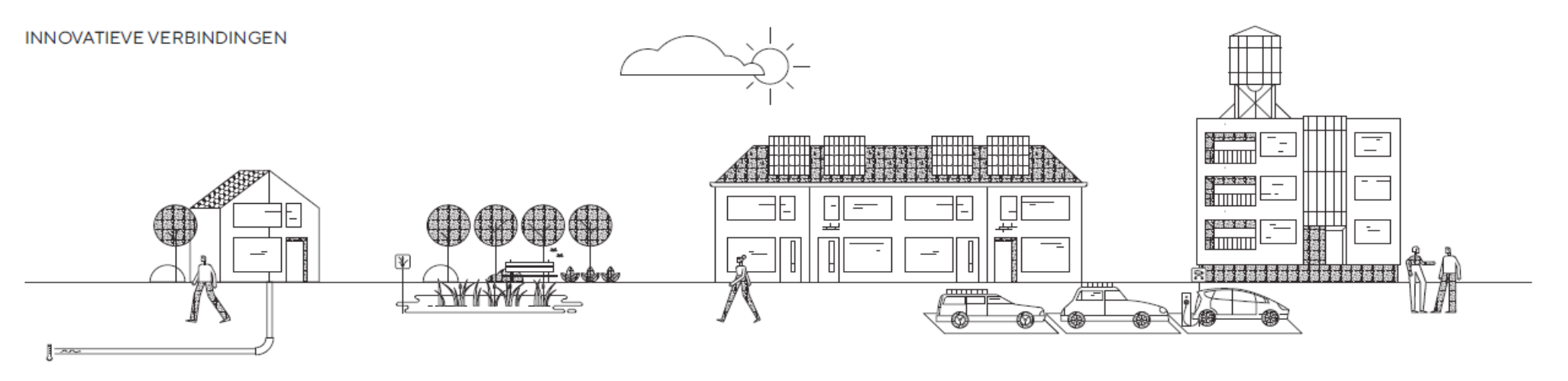
Towards a climate-resilient future **together**

A toolbox with participatory foresight methods, tools and examples from climate and food governance



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Preface

Human settlements, both urban and rural, face numerous challenges at once: adapting to the impacts of climate change, improving sustainability and reducing greenhouse gas emissions, soil subsidence, urbanisation and renewal, increasing housing demand and goals, unemployment and other economic challenges, and a need for more social cohesion. While governments have knowhow and budgets, and are now developing plans and scenarios for climate resilience and sustainable settlements, it is the local citizens who will be living in these settlements. Consequently, they should be involved in designing, planning, and building their future environment.

However, while many governments are experimenting with citizen participation, it can be difficult to set up meaningful and engaging collaboration between policymakers, citizens, and other local and regional actors. This is particularly challenging for 'foresight' or 'futures' exercises, which focus on designing visions and scenarios and therefore risk the chance of becoming too technical or distant for citizens. Much has been written on the technical aspects of scenario methods, but there is little practical guidance on what might make it engaging to citizens. Rather than recruiting citizens into what feels like a technical process, it should be an actual collaboration. This toolkit offers practical guidance, tools, and tips on how to set up such collaborations in thinking about and jointly developing the future.

The toolkit collects and showcases some of the lessons learned from several international research programs on citizen engagement in the form of practical exercises and advice on how to apply them. These programs include CoCliServ (Co-development of place-based climate services for Action; funded by EU JPI Climate/ERA4CS), CCAFS (Climate Change, Agriculture and Food Security; funded by CGIAR global research partnership), and Utrecht University's Water, Climate and Future Deltas program. The latter funded the development of this toolkit. In addition to playing a role in the training modules being developed by these, we envision that it may provide inspiration and guidance for other policymakers, consultants and researchers involved in collaboratively tackling local and regional future challenges.

Colophon

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Content

Why we need this toolkit

In 1 minute (for those who are easy to convince)

- People everywhere are facing unprecedented climate change. Climate change can impact every one of us – whether you live in crowded cities or rural areas, in delta or arid regions.
- Communities need to adapt to and mitigate climate change impacts to become more resilient and sustainable in the future.
- Citizens are essential actors in making a place more climate-resilient and sustainable, because:
  - they can improve the quality of new climate policies and plans with their holistic, locally grounded perspectives;
  - they are needed to support the implementation of new climate policies and plans; and
  - they can implement certain adaptation measures themselves.
- Generally, local authorities underline the role of citizens in climate action but many experience difficulties with organizing citizen participation in a way that is meaningful to both citizens and policymakers.
- Future climate change is uncertain and short/medium-term actions to strengthen community resilience need to anticipate this uncertainty. Foresight methods help to guide these local decisions.
- 'The future' is, however, often a rather abstract thing to people, citizens in particular. Nonetheless, they want a say in how to shape the future of their living environment. That requires some practical tools that help them structure this process of thinking and designing.
- This toolkit offers practical foresight methods and tools for organizing citizen participation in the process of building climate-resilient and sustainable futures.

In 5 minutes (for those that are a bit harder to convince)

As we speak, urban and rural communities are facing a wide array of complex challenges at once when it comes to livability.

There are climate change impacts like sea level rise and extreme weather events that pose high risks [1]. Urban citizens experience heat stress, droughts and floods and farmers in rural areas see their yields waste away. The only way for communities to cope with these extremes is by becoming resilient to climate change impacts that are expected to become more frequent and severe in the future [2]. Climate resilience is defined as "the ability [of a city or urban system] to absorb disturbance while retaining identity, structure and key processes" [3, p.164].

There are also socioeconomic issues such as unemployment, poverty, inequality, housing demand and degrading neighborhoods that ask for political action. Strikes and riots exemplify growing uncertainty and dissatisfaction with local communities globally.

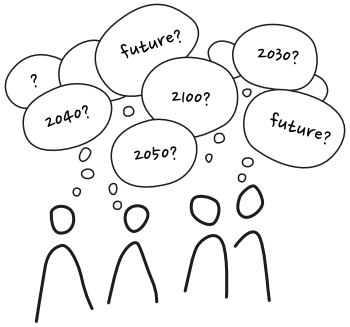
We need sustainable development

A novel approach to dealing with such complex issues is to take a more holistic perspective on sustainable development in order to identify solutions that serve multiple purposes. Sustainability goes beyond climate action alone and covers multiple aspects of (human) life – from 'quality education' and 'life on land' to 'work and economy' (see Figure 1). Sustainability actions in neighborhoods, cities or on the land thus benefit the biosphere, society and economy simultaneously. Ambitions of local governments to develop a climate-resilient and sustainable future therefore requires a holistic, integrative view on climate change that includes collaborative efforts of multiple policy domains [2, 9].

Figure 1. UN Environment's Sustainable Development Goals [10].

We need more democratic climate policy and action

Recent studies found out that citizens narrate holistically about climate change – they take many dimensions of life into account and interpret sustainable futures in a much broader sense as compared to representatives of institutional actors [11]. Their multi-issue perspectives can open up opportunities for an innovative climate risk management approach that simultaneously contributes to other priorities such as improving the neighborhood quality or food security [4, 12].



However, traditionally, policy plans to tackle public issues have been developed by policymakers that work within their own departmental silos; hence climate risk management is barely in conjunction with social and economic priorities [4, 5]. For instance, climate adaptation policies often focus on structural solutions such as strengthening dikes and dams or renewing sewages. Technical approaches tend to underemphasize the essential role of citizens in strengthening resilience, while it is generally known that complex issues like climate change ask for a range of actions that governments alone cannot implement [6, 7, 8].

Despite their crucial role citizens are often excluded from policymaking processes. Many feel their wishes, desires and fears are neglected when climate plans are imposed while they have to live with these plans as well as bear the implementation costs [13, 14]. To support citizen action and facilitate their (new) responsibilities, local authorities need to empower citizens and engage them more actively in policy processes [16].

Citizen involvement is thus essential as they 1) can enrich climate adaptation and mitigation plans with their holistic priorities; and 2) are needed to support the implementation of plans; and 3) implement measures themselves (e.g. regreening their pavements) [15].

Box 1. Quote participant workshop [15]

"Many future challenges we face today, like climate change cannot be solved by one actor alone. There is a need for collaboration between governments, citizens and civil organizations"

Dare to deal with an uncertain future

If there was only one way to future sustainability it would have been easy to develop adequate measures. Yet the future is highly uncertain as we live in a complex, dynamic world with climate disturbances occurring at unexpected moments in time, with varying levels of intensity and at different geographical scales. The word 'uncertain' already implies that there are multiple futures possible. Predicting one most likely future would therefore not be the right way to deal with complex challenges (see Figure 2). Instead, to anticipate uncertainty it is important to widen our perspective and envision multiple different, surprising futures, including more desirable futures (see Figure 3). New insights about opportunities and challenges that different futures may bring about can then be considered and acted upon in the present.

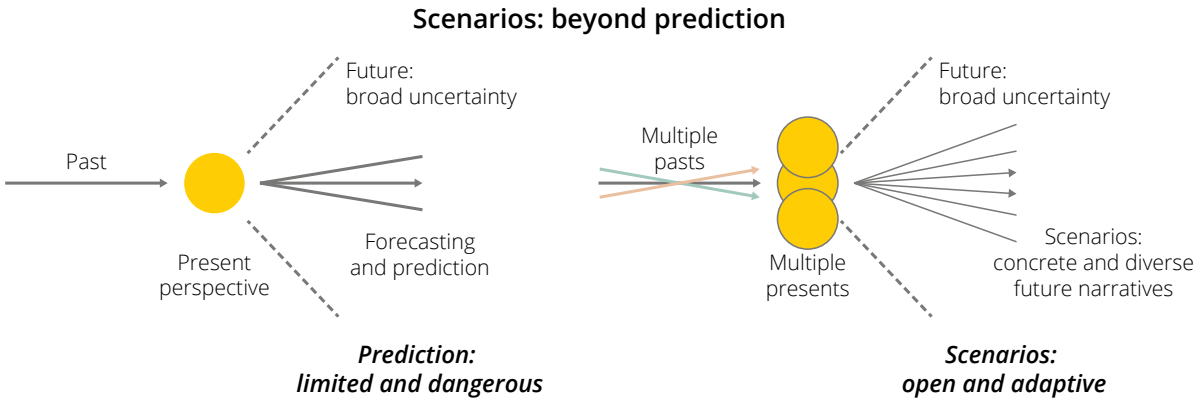


Figure 2. Predicting one future (left) versus anticipating multiple futures (right) [63].

Effective climate adaptation approaches that protect communities from disasters thus need to anticipate long-term uncertainty through short/medium-term actions [44]. This is where the role of foresight, described as 'the act of thinking about the future to guide decisions today' comes in [54, p.546].

Methodologically speaking, experimenting with uncertain futures asks for creative methods and tools to imagine situations that are completely different from the present. Diverse images of the future also result when a blend of different perspectives (e.g. policymakers, citizens and other stakeholders) are included.

Figure 3. Multiple pathways to a desirable future. Source: [64].

So, then why this toolkit?
Summing up, there is a need for 1) a more inclusive, democratic approach to sustainable development. We need to move beyond top-down approaches to climate action and engage citizens too. Although many local authorities may have formulated ambitions to involve the wider public in policy processes, they often struggle with organizing meaningful participatory exercises. The result – distrust and dissatisfaction among participants – is something we want to avoid with this toolkit.

At the same time, there is a need for 2) guidance on how to deal with complex challenges of making a neighborhood, city or rural area more climate-resilient in an uncertain future. The many different methods collectively described as 'foresight' include scenarios that offer challenging new perspectives on the future that can be used to 'crash test' desired visions of the future [30]. Foresight methods also lend themselves for developing these desired visions of what a climate resilient and sustainable future would look like [17].

The toolkit focuses on these two challenges combined: 1) citizen participation in 2) foresight methods. It gives hands-on tips and tricks on how to organize participatory exercises and use particularly useful foresight methods.

The toolkit is based partly on the CoCliServ project on citizen involvement in foresight for climate resilience. It also draws on lessons from a long-running global participatory foresight project under the CGIAR Climate Change, Agriculture and Food security Program, where foresight has been used for over 10 years and across 30 different countries to successfully guide policies and strategies.

Who can use it?

The toolkit is developed for municipalities and governments (e.g. policymakers), NGOs and community leaders/organizers, and third parties (e.g. consultants), who want to engage citizens in thinking about how to become more climate-resilient and sustainable in the future. The step by step guidance makes it suitable for readers without any experience in citizen participation and/or foresight whatsoever. At the same time, more experienced readers will find innovative combinations of methods and tools that are unique within the field of citizen participation and foresight. Interested readers will be given more detailed background information as well as be updated with the latest case study examples.

How to use it?

We will walk the reader through the toolkit in two phases: one is prior to the exercise, or what we call the preparation phase, and one is during the exercise itself – the action phase.

In the preparation phase we discuss important matters to consider when preparing exercises that involve citizens. Chapter 1 invites project leaders to formulate *why they want participation*. This goal is important as it closely relates to the question of *who to involve* (Chapter 2) and *what foresight methods to use* (Chapter 3).

After this preparation phase it is time for action. The exercise can start. Chapter 4 elaborates on the foresight methods introduced in Chapter 3 by explaining *how* to use them in combination with several practical tools.

The Chapters give a basic idea on how to organize foresight exercises in practice. We provide more background information at the end of the toolkit. We also provide two example cases which we illustrate along the four Chapters: one participatory foresight exercise organized in an urban delta in The Netherlands and one in a rural area in Africa.

The preparation phase / *before the exercise*

The preparation phase comprises three Chapters (see Figure 4). In Chapter 1 'Why citizen participation?' we invite you to critically think about what you want to achieve with organizing citizen participation to critically think about why they want citizen participation. We made a distinction between three goals of citizen participation: 1) policy development; 2) community building; and 3) knowledge and capacity building. In Chapter 2 'Who to involve?', we look into the question of who to involve in the exercise and how they can be motivated to participate. Then in Chapter 3 'Which foresight methods to use?' we discuss what foresight methods lend themselves to be used in participatory exercises. There are three categories: 1) *exploratory scenarios* to explore a range of plausible futures; 2) *visioning* to imagine what a climate-resilient and sustainable future would look like; and 3) *pathways* to explore ways that could lead to that climate-resilient and sustainable future.

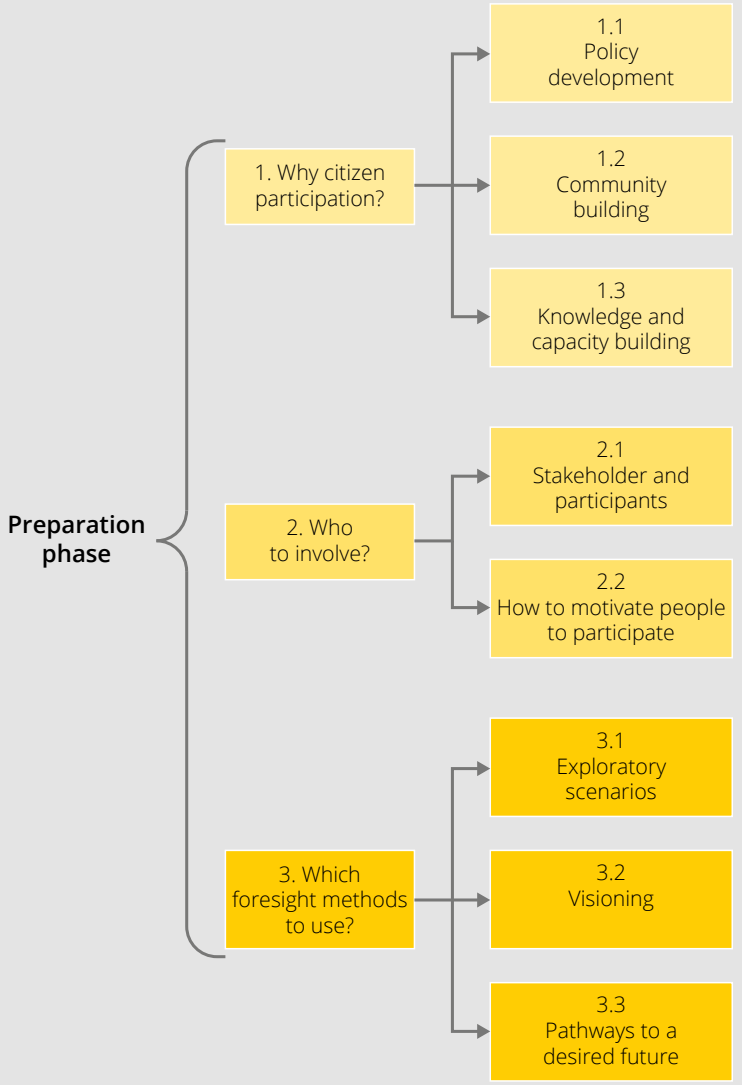


Figure 4. Overview of the preparation phase.

1 Why citizen participation?

Participatory exercises ask for considerable investments of time, money and efforts. The first step of the preparation phase is therefore to critically think about the actual goal of citizen participation [14]. Why do you want to involve citizens? And how would citizens benefit from the output or the process of the exercise? [4]. We assume project organizers to pursue a (combination of) participation goals (see Figure 5):

1. To use citizen knowledge in policy development for climate adaptation and mitigation (section 1.1).
2. To raise public awareness about climate change, stimulate learning and gain support for climate adaptation and mitigation plans through community building (section 1.2).
3. To find what specific information or support local stakeholders would need to adapt to and mitigate climate change in terms of knowledge and capacity building (section 1.3).

The choice of *who to involve* (Chapter 2) and *which foresight method to use* (Chapter 3) largely depends on these objectives [14].

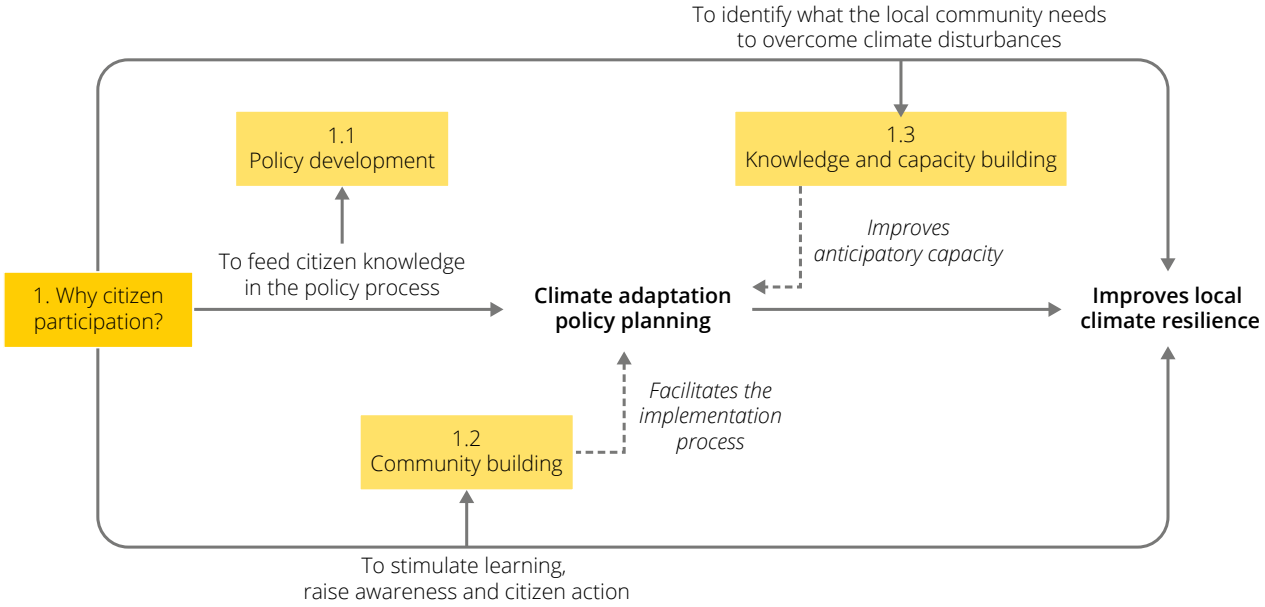


Figure 5. Overview of Chapter 1.

Collective action to strengthen community resilience requires collaboration and trust-building between citizens and policymakers [17]. Experience shows that it can cause disillusionment if citizens expect they can shape the policy process while project organizers have other goals in mind, for instance to simply raise awareness about climate adaptation or to stimulate citizen action. It is therefore essential to transparently communicate the intended goal to participants beforehand [21].

1.1 Participation goal #1: Policy development

For many democratic governments, public participation in policy development has been part of the process for quite some years**.** Participation gives citizens the opportunity to make their opinions, priorities and fears about the future explicit to municipal authorities. Scholars [22, p.373] define the goal of citizens 'informing policy' through participatory foresight exercises as: "generating insights regarding the dynamic of change, future challenges and options, along with new ideas and transmitting them to policymakers." From the perspective of policymakers, citizen input can be seen as the *product* of participatory foresight exercises (see Figure 6), which by nature is more 1) socially relevant; 2) experimental; and 3) robust [14, 4, 20, 23]. Authorities can 'harvest' this knowledge and use it to improve policymaking. The diversity of citizen perspectives can let authorities question and broaden their own perceptions of reality [24]. Policy formulated through the use of participatory foresight can therefore become better informed about desired and challenging futures, more legitimate in terms of taking the concerns of those potentially affected on board, and more effective by involving those who can take action [30].

1.2 Participation goal #2: Community building

Organizers can also aim to enhance community building with participatory exercises. Community building is all about how the *process* itself can generate societal impact, for instance by changing people's perspectives, raising awareness and enhancing public involvement in climate-resilience and sustainability challenges [22, 24, 25]. The community building goal can thus be seen as an instrument to build support for the change that the implementation of adaptation and mitigation plans bring about in the local context (see Figure 5) [22, 26, 25].

Only aware and informed people are able to reflect on their own behavior and ability to anticipate, plan and respond to climate change impacts. Participatory exercises can stimulate people to make decisions that contribute to more climate-resilience [27]. For example, the impact of a cloudburst on a city can be reduced if citizens consciously regreen their gardens to improve rainwater

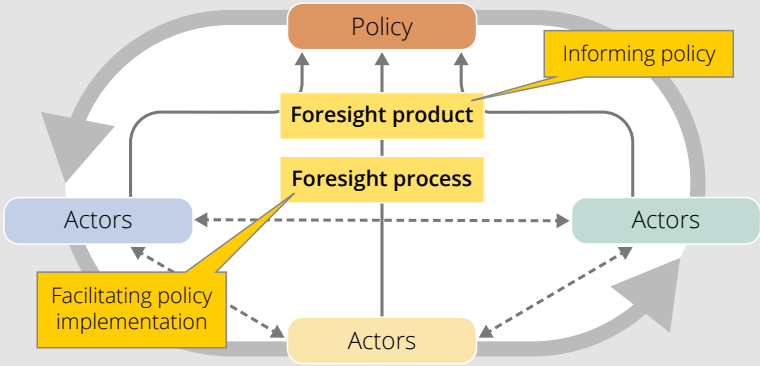


Figure 6. Visualization of the added value of citizen participation in foresight exercises for policy development: to inform policy and/or to facilitate policy implementation.

Box 2. Degrees of participation

Citizen knowledge can improve the quality of adaptation and mitigation plans. However, the goal of 'informing policy' is broad; there are various ways in which authorities can involve citizens in the policy process. For instance, they can be asked to provide their input in early policy development phases, or they can only be allowed to quickly respond to plans that are already developed by authorities. The degree of participation has implications for the actual impact citizens can have on the content of policy plans [14]. It is essential to be clear about this in order to avoid false expectations.
Click here for more information on different degrees of citizen participation.

"If there are plans to change things, then citizens have to be involved. Do not just send a letter about what will happen. Rather say 'OK this is what we [policymakers] want to achieve, how do you [citizens] think we should do that and do you think we are on the right way?"

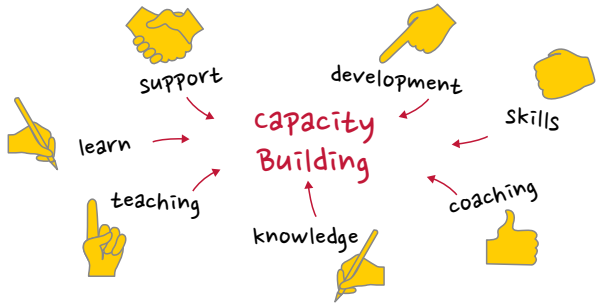
(Participant CoCliServ Dordrecht)

infiltration and storage capacity [16]. Or in times of heat stress or floods, small adaptation measures in and round the house or a helping hand for friends, families and neighbors already makes a neighborhood more resilient to climate change disturbances [8]. They can also lead to citizen networks that organize collective actions, for example community gardens in the neighborhood [28, 29]. Such public mobilizations could put pressure on authorities to develop plans that are in line with community priorities.

1.3 Participation goal #3: Knowledge and capacity building

Any action or effort to adapt to climate change or contribute to sustainability starts with knowledge. Citizens that know how climate change can impact their local context will be better prepared and will better understand the importance of adaptation plans. A possible reason why people are unaware of climate change impacts can be the lack of climate(-related) information tailored to their local situation and local needs. This can range from information on what their neighborhood or farmland could possibly look like under different scenarios, to cost-benefit calculations of concrete climate action plans. While knowledge and awareness is not the only issue driving local interest in adaptation – citizens may simply have other pressing concerns that take priority – it is part of the equation [15].

The goal of participatory foresight methods can therefore be to improve local knowledge development and communication at times when it is especially needed. This could help citizens and other local actors to better weigh the local relevance of climate change impacts, policy options, their own roles in adaptation, and how they might tie in with other concerns.



2 Who to involve?

With the participation goal in mind, organizers can start thinking about who to involve in the participatory foresight exercise. This is the next step of the preparation phase. The current Chapter helps project organizers to identify relevant stakeholders and looks into the question of which participants to invite when (section 2.1). We also give practical tips on how to get people motivated to participate (section 2.2) (see Figure 7).

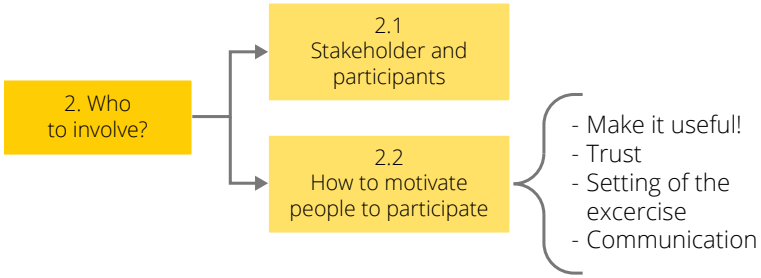


Figure 7. Overview of Chapter 2.

2.1 Stakeholders and participants

Stakeholders

Stakeholders are local people with an interest in, or whom are influenced by climate impacts in a particular city, neighborhood, village or rural area [31]. Traditionally, local governments are primary actors when it comes to developing and implementing adaptation measures to protect the community from droughts, flooding, storms or heat stress. Yet the efforts of multiple local stakeholders, among which citizens, is needed to truly enhance climate-resilience. Step one is to involve them in thinking about appropriate climate adaptation measures [8]. Relevant stakeholders in this toolkit therefore include **at least local citizens** and optionally municipal workers (e.g. policymakers), local NGOs, companies and (scientific) experts. Ideally, the process is initiated by or with key local actors. It is very useful to work with local 'connectors' or hubs, both in the municipal organization and in neighbourhoods (e.g. community centres or similar meeting spaces, social workers, social entrepreneurs, etc.).

Participants

When relevant stakeholders are identified, the next step is to decide who to invite for the exercise, which depends on the participation goal. For instance, goals related to *community building* and *knowledge and capacity building* benefit from a diverse group of citizens in order to gain a realistic understanding of knowledge needs in the community. Participation exercises with these goals ideally attract participants that are highly diverse in professional background, interests, cultural background, age, gender and experiences. The input of heterogeneous groups of participants is also valuable in early phases of *policy development,* when the problem definition and the question of what a climate-resilient future would look like is still flexible and open for debate [32, 33, 24]. Participatory exercises that engage a diverse group of participants should be designed in such a way that people do not necessarily require specific knowledge, meaning everyone should be able to participate and share their voice [18].

Some participation practices require additional technically sound or expert knowledge. For instance, there will be phases later in the *policy development* process where more expertise is needed to develop concrete and effective adaptation plans (see page 59 for more information on various degrees of citizen participation). Also projects focused on *knowledge and capacity building* may require more expert knowledge to design climate information that fits the local needs. Organizers may then choose for skewed representation [14].

2.2 How to motivate people to participate?

Although a diverse group of participants is often preferred, participatory exercises usually attract the same groups of people – middle-aged, high-income, interested in sustainability and/or with a strong commitment to the neighborhood [4]. It requires more efforts to address those without any interest in climate-related issues and those who lost trust in authorities. At the same time, not everyone is able to participate in person due to a lack of time, money, or mobility [31, 25]. Engagement with citizens prior to the exercise helps to gain an understanding of local needs as well as to identify potential obstacles for participation [31}. There are some general principles when it comes to stimulating participation.

> Make it useful!

First and foremost it is important to embed the participatory foresight exercise in people's practices. Knowing that people have diverse priorities, how could the exercise be valuable for them? Experience shows that there are several possible reasons for stakeholders like citizens to participate in foresight exercises. One is that they may want to feed their input in municipal adaptation planning

[25]. This can be done by coupling the exercise to existing activities, for example municipal plans to reconstruct a sewage system. By specifically linking them to the planning process, foresight exercises form a direct communicative bridge between citizens and municipalities.
Citizens may also want to share their expertise or perhaps learn from others. Or they want to represent their fellow-citizens in discussions with authorities. They can also be driven by social reasons, to meet other citizens and policymakers, to network or just to have fun. Incentives can motivate even uninterested or cynic people. Citizens can thus decide to participate in foresight exercises even though their input may not directly end up in policy planning. Organizers should understand these motivations to manage expectations participants may have [25].

> Trust

The degree to which people trust a certain project and its organizers determines whether they want to spend time and efforts on participation. Trust building may require (simple) efforts from project organizers prior to the exercise. For instance, Marschütz and Wardekker collaborated with a local cafe and neighourhood centre [11, 13]. A year later they organized a follow-up workshop for these citizens together with local policymakers to identify effective climate adaptation plans in the neighborhood. However, only three citizens showed up. Even personal invitations did not make more citizens decide to participate. It turned out that although citizens indeed trusted the researchers, there was much distrust in local authorities [4]. Therefore also policymakers themselves need to actively engage with citizens by literally going into the neighborhood and add something positive, showing their willingness. This contact helps policymakers to understand the local context and comply with community norms and priorities [19].

> Setting of the exercise

The setting of exercises is an often mentioned obstacle for citizens to participate. Choices regarding the **frequency**, **duration** and **location** of participatory exercises are therefore essential.

First of all, with regards to the **frequency**, organizers should think carefully about how many participatory exercises are needed in order to achieve their project goal (see Chapter 1). Some participation goals like *community building* can be met with only one participatory exercise. *Policy development* goals may require several exercises, especially when municipalities engage citizens in multiple phases of the planning process – i.e. from initial agenda setting up to the actual implementation of plans.

Secondly, **the appropriate duration** of a participatory foresight exercise also depends on what organizers want to achieve at the end of it. They should be aware, however, that the duration has direct implications for citizen participation.

It is usually short low-key evening sessions in the neighborhood that attract relatively many citizens [15]. Such community gatherings generate a representative idea about people's desires and concerns, raise awareness and provide a platform for discussion. This is particularly useful for participation exercises with goals related to *community building*. Short exercises may however not produce output that is specific enough to feed in policy planning [15]. Longer backcasting workshops (of half, whole or multiple days) obviously generate more detailed and thus useful material for *policy development* [29]. At the same time, long exercises attract less participants, which can make the output less representative [4]. A way to solve this is by conducting interviews, surveys, or focus groups during short exercises with a larger group of citizens to get a first idea of their perspectives. If people are not available to attend exercises physically, online surveys can serve as an ultimate way to involve them anyway (see Box 3) [23]. Information collected through interviews, focus groups and (online) surveys can then be analyzed by data analysis tools and used as a basis for longer, follow-up exercises with less participants [4]. Particularly for longer sessions it requires thinking on how to compensate participants for their attendance (e.g. with incentives like money or a gift card). It is also important to be aware of the experience that exercises usually take longer than expected. This can result in a tendency to rush the end, which may again have consequences for the usefulness of output [4, 42].

Finally, with regards to **the location** of the participatory exercise, experience shows that people prefer exercises that are organized close to their homes, as it leaves them in their safe space and does not require much travelling. Besides practical reasons, organizing participatory exercises in the area of context (e.g. the local neighborhood or farmland) is also a way for organizers and authorities to their show their willigneness to truly engage [15].

> Communication

Creating the right physical setting for participation is one part. The second part is to frame the exercise properly [23].

- Show the relevance of climate adaptation
  Although the issue of climate change has obtained increasing attention in the public debate, it is mainly climate mitigation (e.g. the energy transition) that people are aware of and act upon. When it comes to adapting to climate change, there is much less attention to direct action. Especially in Western Europe, many people have not experienced major impacts on their livelihood yet. A lack of urgency could lower the motivation for people to participate in exercises related to climate adaptation. It is therefore essential to first raise awareness with tools that show what their neighborhood, city or farmland could look like in the future under climate change impacts [35, 25]. For instance, the Vrije Universiteit Amsterdam (VU) [36] has organized guided walks through

Box 3. Case study example: online visioning

UN Environment's Global Environment Outlook-6 for Youth collected visions on a desired future of more than 1900 young people. Respondents were asked to fill in an online survey where one question was: '*What does your desired future look like in 2050?*' Participants first had to choose at least one SDG that they thought would represent their desired future best. Then, participants were able to freely elaborate on their vision in a blank space. The outcome is a broad idea of how young people globally see their desired future [45].

the city to show local spots that are particularly vulnerable to climate change impacts. Project organizers can also design posters with a visual maps of the neighborhood, city or farmland affected by climate change impacts under various scenarios. Another way to stimulate people's imagination is to provide an interactive experience that shows a glimpse of what the future could entail. Utrecht University's Urban Futures Studio built an experiential exhibition where people could literally 'walk' from the present into the future [37].

- Invitation

  One way to invite a diverse group of participants is to go into the neighborhood and talk with people in the local cafe or on the street. A less personal yet more efficient way is to hang posters, distribute flyers at local stores or shopping centers or use social media like Twitter and Facebook (see Figure 8). A more formal approach is to personally invite a specific group of people by letter or telephone [38].

  The framing of the invitation text is also important to consider. Broad framing could attract a more diverse, less experienced group. Questions like "*How will everyday life in your city be carried out in a much more environmentally friendly way 30 years from now?*" do not require specific expert knowledge, only commitment to the city and an interest in environmental questions [38]. Specific framing of the goal of participation could attract more experienced people like experts but can also raise expectations [32]. Participation goals related to *policy development* in particular may imply that citizens can influence the planning process. Such words can cause disillusionment with participants and can scare local authorities that want to keep control over the process and avoid controversial issues [29]. The invitation text should therefore be a balance between fun to use and true to life [7].

Figure 8. Invitation for the participatory exercise by the municipality on Twitter.

SUMMARY TOOLS **PREPARATION PHASE**

- **1. Interviews** (p.19)
  - To gather a first set of citizen perspectives as a basis for visioning exercises
- **2. Surveys** (p.19)
  - To gather a first set of citizen perspectives as a basis for visioning exercises
- **3. Focus groups** (p.19)
  - To gather a first set of citizen perspectives as a basis for visioning exercises
- **4. Data analysis tools** (p.20)
  - To analyze citizen perspectives
- **5. Guided walks** (p.20)
  - To engage with the local community
  - To raise awareness about climate change impacts
  - To let citizens and policymakers meet in an informal way
- **6. Visual maps** (p.21)
  - To raise awareness about how global trends may impact the local context
- **7. Future experiences** (p.22)
  - To raise awareness about future climate change through experiential imagination

Tool 1. Interviews

LEVEL ORGANIZER: ■■□ LEVEL PARTICIPANT: ■□□
DURATION: 30-60 minutes

What?
Project organizers can conduct interviews to get an understanding of the local context. The process of conducting interviews can contribute to trust building and help create an opening when participants need to be recruited for the actual participatory exercise.

When?
In the preparation phase.

How?
Questions can be on experiences of climate change impacts like heavy rainfall events or extreme droughts and how they affect the people's daily life [11].

Questions can also be on desires for the future. Projects with limited resources can use these citizen visions as a basis for participatory visioning exercises [15]. This makes interviewing a tool to represent a larger group of stakeholders in visioning exercises without the need to physically attend the exercise.

For more information about interviews, see [11 – p.161 & 162 for example questions]

Tool 2. Surveys

LEVEL ORGANIZER: ■□□ LEVEL PARTICIPANT: ■□□
DURATION: 15-30 minutes

What?
Project organizers can conduct surveys to get an understanding of the local context. Online surveys can reach a broader and diverse group of citizens. They do not necessarily require personal contact. A lack of direct contact between organizers and participants means there is less trust building.

When?
In the preparation phase.

How?
Questions can be on experiences of climate change impacts like heavy rainfall events or extreme droughts and how they affect the people's daily life [11].

Questions can also be on desires for the future. Projects with limited resources can use these citizen visions as a basis for participatory visioning exercises [15]. This makes surveys a tool to represent a larger group of stakeholders in visioning exercises without the need to physically attend the exercise.

For more information about surveys, see [11 – p.161 & 162 for example questions]

Tool 3. Focus group

LEVEL ORGANIZER: ■■■ LEVEL PARTICIPANT: ■□□
DURATION: 1-2 hours

What?
Project organizers can conduct focus groups to get an understanding of the local context. Focus groups are particularly effective to stimulate group discussions and is due to the personal character a good way for local stakeholders to get to know each other and build trust.
Focus groups usually include a maximum of about 10 participants.

When?
In the preparation phase.

How?
Questions can be on experiences of climate change impacts like heavy rainfall events or extreme droughts and how they affect the people's daily life [11].

Questions can also be on desires for the future. Projects with limited resources can use these citizen visions as a basis for participatory visioning exercises [15]. This makes focus groups a tool to represent a larger group of stakeholders in visioning exercises without the need to physically attend the exercise. They do however need to physically attend the focus group.

For more information about focus groups, see [11 – p.161 & 162 for example questions]

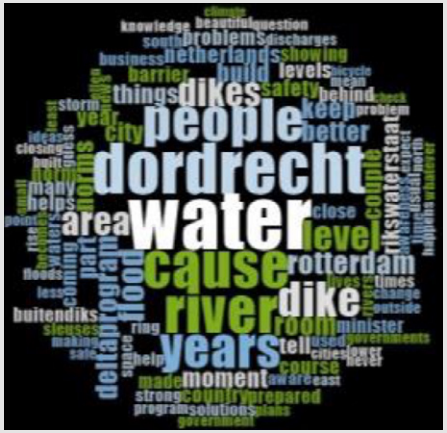
Tool 4. Data analysis tools

LEVEL ORGANIZER: ■■■ LEVEL PARTICIPANT: □□□
DURATION: 1-2 hours

What?
Interviews, surveys and focus groups generate a large number citizen perspectives. These narratives can be analyzed with tools in order to make them useable as a basis for the actual participatory exercise [11].

When?
In the preparation phase.

How?
There are various data analysis tools to code, analyze or cluster large amounts of narratives. Examples are word frequency diagrams that can be visualized in Word Cloud [11].



A word cloud of public narratives. Source: [11].

For more information about data analysis tools, see [11 & 63]

Tool 5. Guided walks

LEVEL ORGANIZER: ■■■ LEVEL PARTICIPANT: ■□□
DURATION: 1-2 hours

What?
Guided walks with citizens and policymakers in the neighborhood or city have proven to be a good way to share knowledge about climate change impacts, hear personal experiences and build urgency in the local community.

When?
In the preparation phase.

How?
Experts can show places in the neighborhood that are vulnerable to climate change impacts. In addition, smartphones or tablets with Augmented Reality can be used to visualize what extreme weather events could mean for the area as a way to stimulate participants' imagination during the walk. Local citizens can also organize the walk for experts and policymakers to show what they care about and what they fear in the future [36]. They can bring pictures of their experiences with climate change events. Activities like walks are an informal way for citizens and local policymakers to directly interact.

Guided walks can also be organized for elementary school students. Children often share what they have learned with their parents which could again be a trigger for them to participate the participatory exercise and share their wishes.

Participatory Mechanisms report for the Dutch case study in Itteren and Borgharen. Source: [36].

Tool 6. Visual maps

LEVEL ORGANIZER: ■■■ LEVEL PARTICIPANT: ■□□
DURATION: 30-60 minutes

What?
Visual GIS maps (e.g. 2D, 3D, fly-over) of the neighborhood, city or rural area under different (climate) scenarios can be used as a tool to imagine plausible future situations. The map can contain any information about climate change impacts and how it affects the local area – from flooding to extreme heat. Visual maps make use of people's emotional connection to the place and as such bring climate issues to life.

When?
In the preparation phase.

How?
Maps with the effects of climate change (e.g. the impact of an absence of trees in times of heat stress) on posters in the neighborhood or in local newspapers to raise awareness about the importance of climate adaptation.

Adaptation plans under alternative local climate scenarios. Source: [35].

For more information about visual GIS maps, see [35].

Tool 7. Future experiences

LEVEL ORGANIZER: ■■■ LEVEL PARTICIPANT: ■□□
DURATION: 1-2 hours

What?
Future experiences can let people experience different futures with all their senses. Such simulations trigger creative thinking and provide a soft space for discussions that open up learning opportunities, awareness building and networking.

When?
In the preparation phase.

How?
Examples of future experiences are model homes or other prototypes that literally provide a glimpse of what could be part of future daily life. Another example is a project by Utrecht University ('Neighbourhoods for the Future') that focuses on the innovation potential of neighborhoods. They listed hundreds of successful neighborhoods that organized innovatively around mobility, energy, water, inclusivity and circularity. Some of them have been presented at an experimental exhibition called 'Places of Hope'. The Urban Futures Studio of Utrecht University has initiated together with urban designers (Non-Fiction and The Cloud Collective) a novel technique to let people experience the future physically and emotionally by literally 'walking' through the past and the present right into the future. https://vimeo.com/333718626

Places of Hope, The Urban Future Studio, Utrecht University. Source: https://www.placesofhope.nl/nieuws/als-het-zo-kan-dan-wil-ik-het-wel/

For more information about future experiences, see
https://www.placesofhope.nl/nieuws/als-het-zo-kan-dan-wil-ik-het-wel/

3 Which foresight methods to use?

The term *foresight* is used by research scholars to cover a wide range of methods for dealing with the future [55]. In this Chapter we discuss different foresight methods and how they can be useful particularly in thinking about local futures that are climate resilient. Which methods to use depends on how you want participants to interact with the future.

Do you want participants to …

- … *explore* what the future may bring, for instance to raise awareness about climate change or to prepare for possible impacts? **Exploratory scenarios** (section 3.1) describe how *plausible* futures may evolve under several drivers of change like temperature rise, extreme weather events and economic growth (see Figure 9, left).
- … *shape* a more desirable future? **Visioning** exercises (section 3.2) invite citizens to think about what their city, neighborhood or farm would ideally look like in a climate-resilient state (see Figure 9, right – the focus point).
- … *find concrete options* to achieve a more desirable future? Citizens can develop their own **pathways of actions** (i.e. backcasting) (section 3.3) that lead to more a climate-resilient and sustainable city, neighborhood or farmland (see Figure 9, right – the dotted lines).

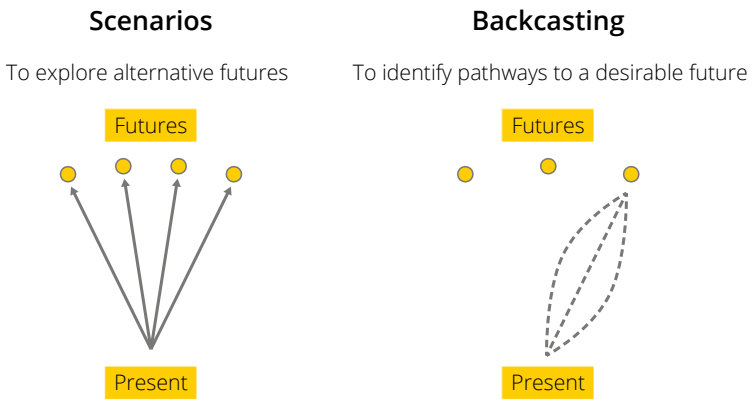


Figure 9. Different perceptions of the future – scenarios and backcasting methods. Source: [29].

In the next sections, we discuss how these three categories of foresight methods can be used in participatory practices with different participation goals.

Experience shows that organizers often use a combination of foresight methods in their participatory exercise (see Figure 10). In section 3.4 we suggest different combinations of foresight methods and explain how they complement each other.

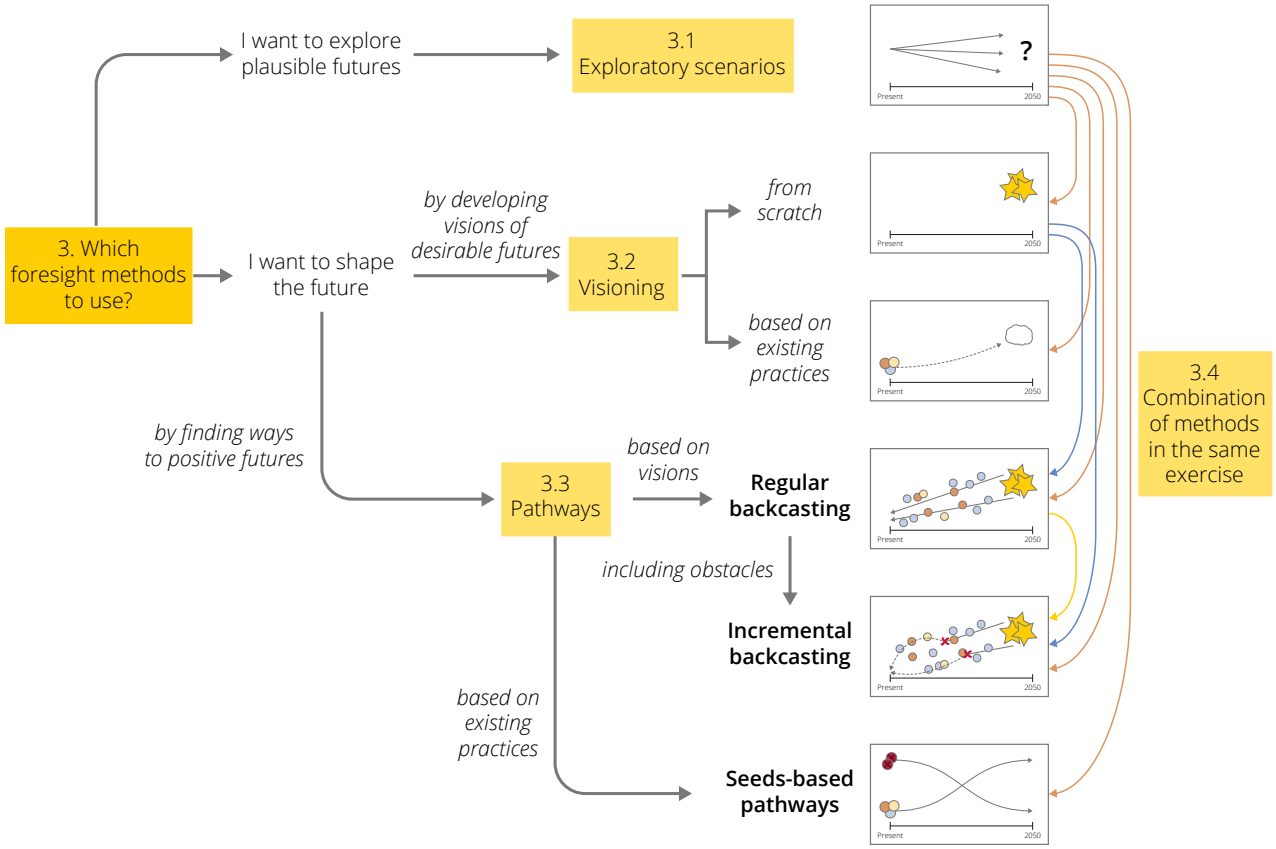


Figure 10. Overview of Chapter 3.

3.1 Exploratory scenarios

3.1.1 What are exploratory scenarios?

Scenarios have an explorative character: they describe a range of alternative plausible futures – future situations that *may* happen (see Figure 11). Exploratory scenarios work from the basic understanding that it is not possible, in complex systems under uncertain futures, to predict the most likely future. Instead, with multiple scenarios one can explore the 'what if' question: what happens to our plans and strategies under very different assumptions about future trends like climate change, demography, lifestyle and technology – creating completely different, challenging scenarios? [54].

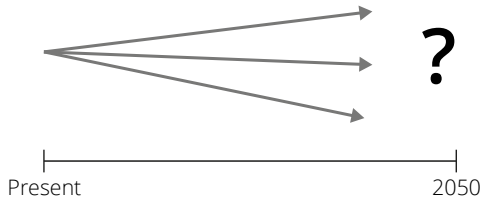


Figure 11. Exploratory scenarios of plausible futures.

3.1.2 Why use exploratory scenarios?

This toolkit specifically focuses on building desirable, climate-resilient futures – be it a city, neighborhood or farmland. In the process of designing a desired image of the future, exploratory scenarios are useful to reveal how concrete action plans can potentially be affected by plausible trends of drivers of change [40]. Exploratory scenarios are thus particularly useful in combination with other foresight methods like visioning and backcasting.
In this section we discuss how exploratory scenarios can be a valuable foresight method in participatory exercises with different participation goals.

> **Participation goal #1: Policy development.** Exploratory scenarios to assess the feasibility of visions and pathways of change.

When the goal of a participatory exercise is to use citizen knowledge in policy processes, it can be valuable to consider to what extent their input (e.g. desired visions - see section 3.2, or pathways of concrete measures that lead to these visions - see section 3.3) is feasible and effective under different socioeconomic and climate scenarios [5, 41, 42, 24]. For instance, scenarios can shed light on questions like: *what would extreme low/high water levels mean for proposed climate adaptation plans in the neighborhood?* [29]. This way desired visions and pathways and subsequent climate action plans become more resilient in the face of future uncertainty [44].

> **Participation goal #2: Community building.** Exploratory scenarios to build awareness about future climate change impacts.

Participatory exercises with exploratory scenarios can let participants experience the 'realness' of changes in climate, socioeconomic and technological trends and how this can affect their daily life [38, 26]. In urban context, the focus can be on mobility, energy or housing demand. For many rural families it is particularly helpful to explore what climate threats they are vulnerable to. This way, exploratory scenarios can serve as a climate service that helps them anticipating climate change impacts. Based on seasonal forecasts they can develop adaptation strategies for crops and planting times [18, 54].

Exploratory scenarios thus can raise awareness and increase participants' understanding of climate change [43] which can help making future-proof decisions (e.g. not paving a garden to let rainwater infiltrate) or to define adaptation measures that reduce expected impacts of droughts, heat stress and storms on agricultural fields [4].

> **Participation goal #3: Knowledge & capacity building.** Idem.

3.2 Visioning

3.2.1 What is visioning?

Visioning is recommended when exploratory scenarios show that a place is not likely to be or become climate-resilient without dedicated action, meaning the current situation needs to change in an alternative, more positive direction. This is where we move from *plausible* to *desirable* futures. Desirable futures can only become reality when they are imagined: a concrete vision of what exactly a desirable future would look like helps to identify concrete actions that lead towards that future. In this toolkit, such visions encompass a perception of what a climate-resilient and sustainable future would ideally look like according to citizens – which can be a broad description but also include specific targets; based on personal values (see Figure 12) or on existing local initiatives (see Figure 13).

Figure 12. Visions of a desirable future.

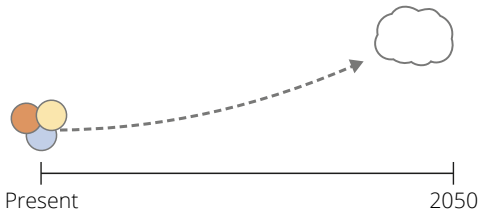


Figure 13. How existing local initiatives can help envision a desirable future.

"We need a multiplicity of visions, dreams and prophecies – images of potential tomorrows."

Toffler (1984)

3.2.2 Why visioning?

Visioning exercises are easy understandable, relatively cheap to organize and well-suited for integrating a lot of diverse citizen perspectives. In this section we discuss how visioning can be a valuable foresight method in participatory exercises that differ in their goals with participation.

- **Participation goal #1: Policy development.** To consider citizen opinions during the process of developing climate adaptation and sustainability plans.

Local authorities can ask citizens to envision their desired neighborhood, city or village to support adaptation policy planning. For instance, questions like *'What does place X look like in the future when we focus on the food chain and how can urban agriculture contribute to that?'* can bring innovative insights during early policy planning phases [12, 42]. With their local knowledge citizens can expose blind spots or opportunities for climate adaptation and sustainability that may otherwise be missed. Discussions with citizens also give insights on community norms and values that need to be respected when implementing adaptation plans. This way, participation helps authorities to develop climate action plans to a future state that citizens find meaningful and worth bringing around [4].

The relevance of citizen visions for policy development increases when they meet certain quality criteria [42] (see Box 4).

- **Participation goal #2: Community building.** Envisioning more desirable, positive futures raises awareness, can stimulate citizen action and build public support for new climate action plans.

Involving citizens in thinking about the future goes further than providing innovative insights for policy. In fact, the visioning *process* itself is particularly important for community building: it raises awareness and stimulates social learning, which are both essential for gaining public support for processes of change – in this case the implementation of adaptation plans [42, 17]. This way, visioning exercises can thus indirectly contribute to the *policy development* goal.

Besides public support, visioning exercises can also stimulate citizen initiatives. When people are involved in formulating local issues and future desires, they are more likely to perceive themselves as 'owner' of the problem and solution, which likely comes with a feeling of responsibility [25]. In addition, positive visions of a better city or livelihood generally gives people a sense of meaning, hope and inspiration, which again can give rise to citizen initiatives in the form of networks, collective action and other forms of public mobilization.

Box 4. Quality criteria visions

In order to be useful for adaptation policy development, citizen visions of a climate-resilient future need to be not only sustainable but also holistic, tangible, plausible, relevant, and shared [42].

Research found out that citizens already think more holistically about sustainability issues than authorities that usually adopt a more technical approach. Tangible visions contain clear goals that are not contradicting. Plausible visions are evidence-based. They can be grounded in reality with exploratory scenarios or participants can be inspired by existing sustainable initiatives [46] that already happen in their own neighborhood, city or in other places. A vision is relevant when it fits the local situation and focuses on people and their responsibilities. Relevance increases when visions are co-designed and shared not only by citizens but also authorities [42].
More information on how to improve the link to municipal policymaking can be found on page 61.

3.3 Pathways to a desired future

3.3.1 What are pathways?

Now that we have a vision of what a climate-resilient and sustainable city, neighborhood or rural village woud look like, the next step is to identify *ways to get there*. By looking backward from the future vision, pathways of solutions, actions, or measures that people deem essential to reach it can be formulated [22, 29]. Normative pathways connect the future to the present through a sequence of concrete local actions. As such, they are a counterpart to exploratory scenarios that sketch plausible futures which are out of local control [7, 20].

There are several ways to develop pathways. In this section, we discuss regular backcasting, incremental backcasting, and seeds-based pathways.

Regular backcasting pathways start with a desirable future state and describe a sequence of short, medium and long-term actions back to the present [23]. When these actions are categorized in themes and placed on a timeline, thematic pathways can be identified (see Figure 14).

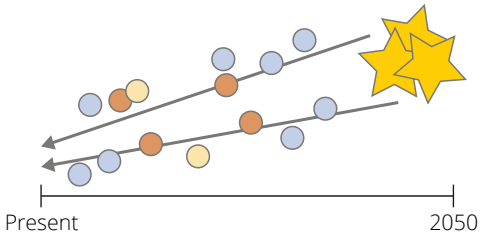


Figure 14. Concrete adaptation actions that form a set of regular backcasting pathways from the future to the present.

Where regular backcasting pathways contain straight paths from the ideal future to the present, researcher Wardekker argues that in reality numerous constraints can happen along way: "*the future rarely unfolds in a linear way. Along the way things can go wrong, or there are instances where you can make use of new opportunities that present themselves. And there can always be surprises.*" [47]. Such disturbances, positive or negative (also called hinge-points – see Box 5), could steer backcasting pathways in a different direction (see Figure 15). Testing the effectiveness of adaptation plans under several exploratory scenarios is often not enough since these are based on broad global trends and are unable to take into account sudden developments. This is why Wardekker et al. [39, 15, 4] developed a novel way of developing normative scenarios that do take into account sudden disturbances: **incremental backcasting pathways**.

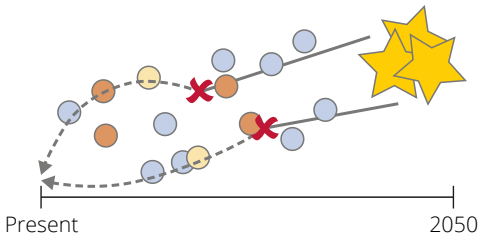


Figure 15. Incremental backcasting pathways that are in essence regular backcasting pathways facing sudden disturbances or using new opportunities that present themselves.

Box 5. Hinge-points

The term hinge-point relates to the concept of 'trigger', which is commonly used in the field of policy planning [48]. It specifies the conditions under which an adaptation tipping point is reached, or in other words, when a particular action is no longer adequate for achieving the desirable state, or when new opportunities arise that accelerate the adaptation process. Hinge-points can be internal and controllable (e.g. the construction of a new sewage system), external and uncontrollable (e.g. economic crisis), climate-related (e.g. extreme sea-level rise) or not climate-related (e.g. high unemployment levels).

Where regular and incremental backcasting pathways start from a future vision, there is now a novel approach to thinking about radically different futures based on the present. It builds on positive, local initiatives that already exist and have proven to be successful – also referred to as 'seeds' (see Box 6) [46]. These **seeds-based pathways** start in the present and explore what is needed for local initiatives around climate adaptation to successfully grow in the future (see Figure 16) [33]. The interesting aspect of this bottom-up pathway approach is that although pathways start in the present, they are able to let people experience a range of realistic positive futures that are not predictable, projectable and may not even be imaginable within the status quo situation [6, 49].

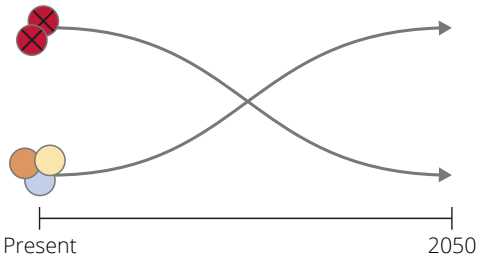


Figure 16. Seeds-based pathways: characteristics of the present and how they can possibly grow or decline in the future.

In this section we discuss how pathways can be a valuable foresight method in participatory exercises that differ in their goals with participation.

3.3.2 Why regular backcasting?

> **Participation goal #1: Policy development.** Backcasting pathways developed by citizens contain diverse and innovative ideas for climate adaptation and mitigation plans.

In backcasting exercises citizens can formulate climate actions that they think are relevant to achieve their desirable climate-resilient neighborhood, city or farmland. They can uncover flaws and provide critical insights to adaptation plans that scientists and local authorities may not be able to capture [25, 2]**.** Local authorities can organize a regular backcasting exercise with citizens if they seek inspiration for more innovative out-of-the-box climate strategies that at the same time better fit the local context and are more likely to be accepted by the local community. This is useful material in early phases of policy processes.

> **Participation goal #2: Community building.** Backcasting exercises to gain public support for adaptation plans.

Backcasting exercises where citizens create their own pathways bring a higher buy-in than if scenarios are simply presented to them [38]. Similar to exploratory scenarios and visioning, backcasting exercises can raise awareness and stimulate learning about climate change impacts.

Box 6. Seeds of Good Anthropocenes

Seeds are local sustainability initiatives that have proven to be effective in other local contexts**.** The 'Seeds of good Anthropocenes' database (https://goodanthropocenes.net/) is full of potentially game-changing initiatives from cities globally [46].

There are several purposes seeds can fulfil in the light of this toolkit. For instance, in *visioning exercises* they can serve as inspiration source of adaptation initiatives that work well in other places. Seeds can also be the basis of forward-looking *pathways* to these visions, since they hold great potential for large innovative change if they grow and scale. Such pathways can reveal conditions that enable these positive seeds to grow, for instance improved infrastructure, taxes, transformative policies, awareness campaigns or governance shifts [49].

Yet other than exploratory scenarios and visioning exercises, backcasting exercises do invite participants to formulate concrete actions for adapting to climate change impacts. The opportunity to contribute to the design of local adaptation plans can make citizens more supportive towards the implementation: citizens that are being heard are more likely to take their responsibilities rather than if responsibilities are just 'dumped' on them [16, 17]. In addition, decisions that citizens themselves make in and round the house are more likely to contribute to climate-resilience and sustainability after this experience. Backcasting exercises can even be the start of new forms of collaborations and partnerships between citizens, municipalities and businesses.

3.3.3 Why incremental backcasting?

- **Participation goal #1: Policy development.** Incremental pathways expose potential obstacles for climate action plans.

Where backcasting pathways are linear, incremental pathways account for the likelihood of sudden hinge-points. Participants can help exploring options to overcome these obstacles by identifying alternative action plans that require switching to another pathway in order to still be able to reach the desirable future. Incremental pathways are particularly useful for policy-related goals of participation: policymakers can anticipate disturbances and work with 'dynamic adaptive policy pathways' that are more robust as they prevent the climate action plan from crashing [39, 15, 4, 48, 54]. As such, incremental pathways explicitly link foresight with policy planning.

- **Participation goal #3: Knowledge and capacity building.** Incremental pathways help to identify potential climate service needs to overcome obstacles.

One way to deal with hinge-points is to develop dynamic policy pathways to a desirable future. However, not all disturbances can be overcome with policy plans only. Some local stakeholders may need other forms of support to anticipate or respond to climate change impacts. Organizers can organize incremental backcasting exercises with citizens and policymakers to identify climate service needs that community members need to overcome a disturbance [15]. An example is specific information (e.g. on disasters, or restoration costs under different scenarios) to better communicate the issue of climate change on moments when it is particularly needed [15, 35, 27]. Since climate experts and scientists are producers of climate information, they are particularly interested in interacting with local stakeholders to understand how they perceive climate change in order to improve the production of usable, relevant science [50]. Rather than just providing climate information, it is a way to look at climate services through the lens of what is actually needed. Or, as

Wardekker et al. [15] formulate: turning matters of fact into matters of concern. Policy makers too can use these insights to develop adaptation plans that fit the local needs.

3.3.4 Why seeds-based pathways?

- **Participation goal #1: Policy development.** Seeds-based pathways can inspire policy makers by showing concrete examples of potential transformations to climate-resilient and sustainable futures.

While backcasting has great potential, a drawback experienced by participants is the perceived lack of expertise to develop concrete actions. Participants also refer to the difficulty of finding a balance between a truly different, more sustainable future neighborhood or city that at the same time is realistic and feasible to develop. In case the local discussion appears to remain 'stuck in the present', organizers can consider to let participants develop pathways from a 'seeds'-based approach – using existing sustainable initiatives that have proven to be successful elsewhere. Pathways based on seeds show positive futures that do not lose connection with present-day realities [49, 33]. Authorities can look into conditions that enable these good initiatives to grow and scale up and apply that to their own local context [46].

Seeds-based pathways showcase potential transformations, but at the same time authorities cannot label them as 'utopian' or 'science fiction': the fact that these local practices have proven their effectiveness in other contexts makes the pathways in fact nuanced and plausible [25, 33]. They can open up traditional policy silos and stimulate authorities to take a more experimental approach to climate-resilience and sustainability.

- **Participation goal #2: Community building.** Seeds-based pathways to let citizens experience the possibility of transforming their neighborhood, city or village.

Seeds-based pathways do not necessarily have to lead towards a specific policy endpoint [33]. The strength of real-life seeds is that they trigger a different way of thinking about what better futures are possible and what is necessary to bring about positive change [32].

3.4 Combinations of methods in the same exercise

Participatory exercises generate more elaborated and thus useful output when foresights methods are used in combination with each other. Figure 17 gives an overview of often used combinations of foresights methods. In Table 1 we further explain the usefulness of each combination of methods.

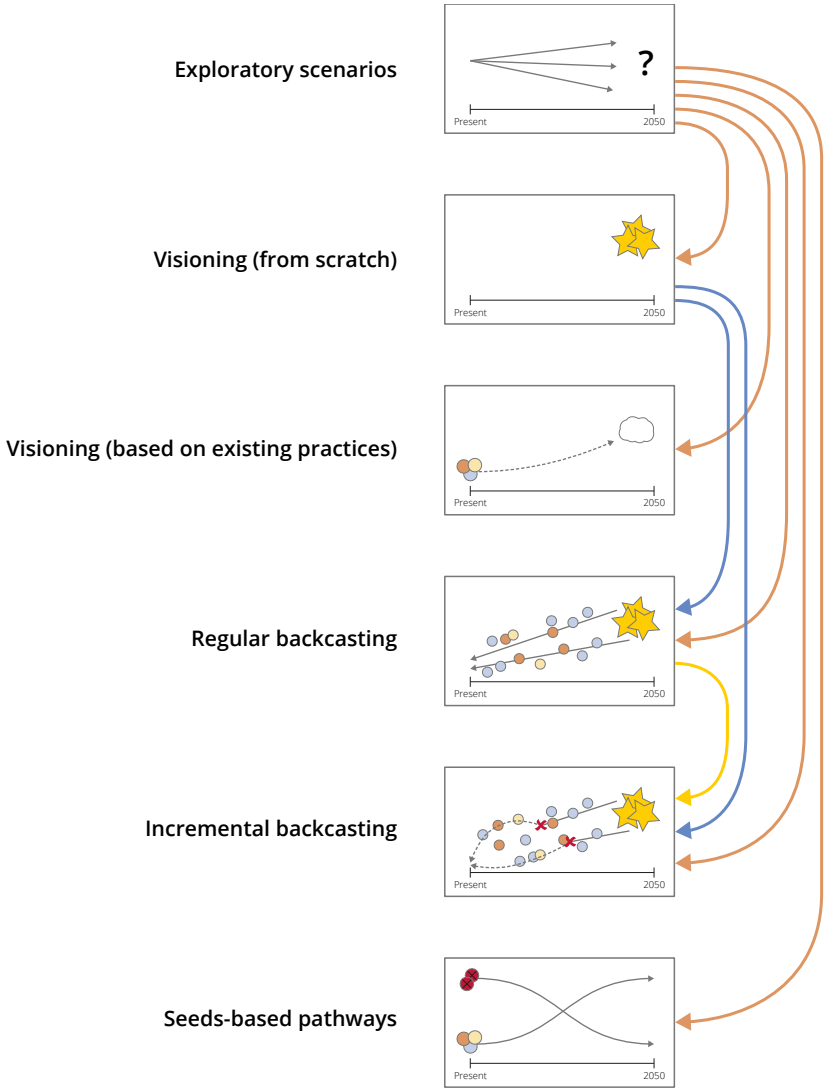


Figure 17. Overview of possible combinations of foresight methods.

Foresight method *Recommended in combination with*	**Exploratory scenarios**	**Visioning**	**Regular backcasting**	**Incremental backcasting**	**Seeds-based pathways**
Exploratory scenarios	x	To develop desirable visions while taking into account the possibility of different plausible futures and the possible implications for visions.	To develop actions to desirable visions while taking into account the possibility of different plausible futures and the possible implications for these visions.	To use elements of different exploratory scenarios as inspiration source for the formulation of hinge-points.	To develop seeds-based pathways while taking into account the possibility of different plausible futures and the possible implications for these pathways.
Visioning	To develop desirable visions while taking into account the possibility of different plausible futures and the possible implications for visions.	x	Visions of a desirable future are the starting point from which regular backcasting pathways can be developed.	Visions of a desirable future are the starting point from which regular backcasting pathways and accordingly incremental backcasting pathways can be developed.	x
Regular backcasting	To develop actions to desirable visions while taking into account the possibility of different plausible futures and the possible implications for these visions.	Visions of a desirable future are the starting point from which regular backcasting pathways can be developed.	x	Regular backcasting pathways are the basis of incremental backcasting pathways.	x
Incremental backcasting	To use elements of different exploratory scenarios as inspiration source for the formulation of hinge-points.	Visions of a desirable future are the starting point from which regular backcasting pathways and accordingly incremental backcasting pathways can be developed.	Regular backcasting pathways are the basis of incremental backcasting pathways.	x	x
Seeds-based pathways	To develop seeds-based pathways while taking into account the possibility of different plausible futures and the possible implications for these pathways.	x	x	x	x

Table 1. Combined use of foresight methods in a participatory exercise.

The action phase / *during the exercise*

As soon as the goal of participation is formulated, participants are invited and relevant foresight methods are chosen, the exercise can finally start – *the show begins.* We gently move from the preparation questions of *why* (Chapter 1), *who* (Chapter 2) and *which* (Chapter 3) to the question of *how* to use the foresight methods in practice (Chapter 4).

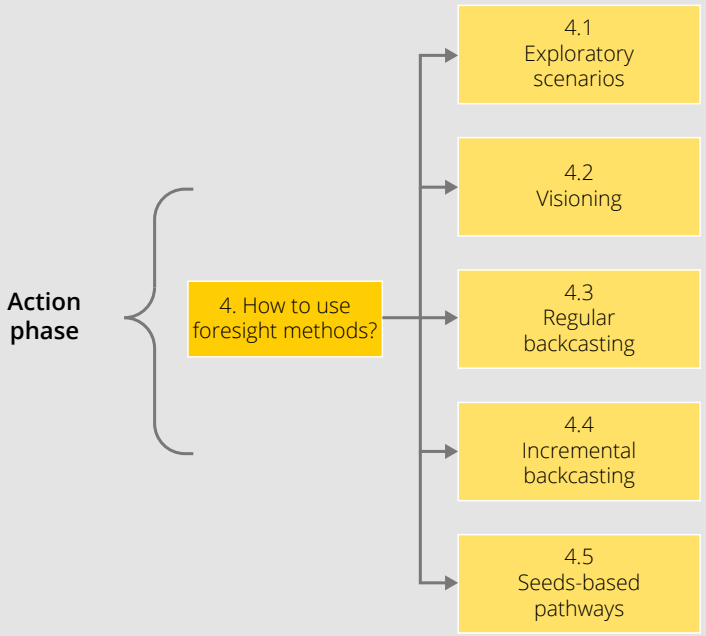


Figure 18. Overview of Chapter 4.

4 How to use foresight methods?

This Chapter provides a step-by-step guidance on how to use exploratory scenarios (section 4.1), followed by visioning (section 4.2), regular backcasting (section 4.3), incremental backcasting (section 4.4) and finally seeds-based pathways (section 4.5) (see Figure 19).

Before start working with any of these foresight methods, it is important to first determine a relevant time horizon and geographical area to focus on [20, 25, 40] (see Box 7).

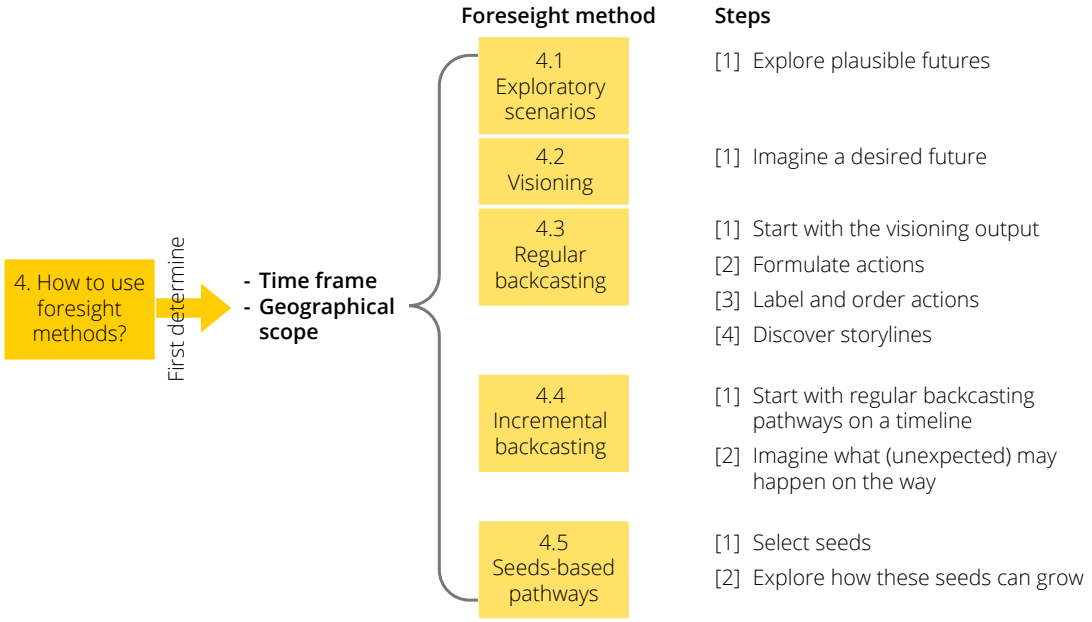


Figure 19. Overview of Chapter 4.

Box 7. Determining the scope of foresight methods

Time horizon

Since the topic of climate resilience inherently links to the future, foresight exercises demand a long time frame (25-50 years) as focus point: adaptation measures to protect local communities must be effective not only tomorrow but also under climate change impacts that occur in 2070. Similarly, a long-term focus is needed since transitions of neighborhoods, cities or rural areas to become climate-resilient and sustainable take many years of dedicated efforts and actions. For most citizens a time frame of up to 40 years is still relevant as it is roughly their working life or that of their children [7].

A short/medium time frame (0-25 years) enables participants to zoom in on concrete adaptation actions that lead to more resilience [20]. Identifying concrete actions is particularly important for participatory exercises with a *policy development goal* – exercises that focus on the far away future only may produce output that goes beyond the interest of policy makers and therefore risk the chance of becoming more of a theoretical exercise rather than a basis for policy [4, 29]. A short/medium time frame is also important for participatory exercises with a *knowledge and capacity building goal* as to focus on the question of what climate information or support would be needed when. Wardekker et al. [4] therefore suggest to use multiple time frames for thinking about climate resilience and sustainability.

Geographical scope

In the light of this toolkit, future thinking requires a focus on the local level (e.g. city, neighborhood, river basin, farm) to make output relevant for citizens and policymakers [20, 24, 27]. At the same time global and national scenarios play a role as context material to assess local visions and pathways on their feasibility [20].

4.1 How to use exploratory scenarios in participatory exercises?

Step 1: Explore plausible futures

Explorations of plausible futures can be based on different data sources. In this toolkit, we distinguish between quantitative, semi-quantitative and qualitative scenario tools.

> Option 1: Quantitative tools

Quantitative tools like computer modelling process large amounts of data from the past and present to extrapolate drivers of past and present change in the future (e.g. 2.5 degrees temperature rise in 2050) [5]. National climate scenarios with projected temperature rise and precipitation levels can usually be derived from online data bases of the national weather service (for instance, in the Netherlands climate data can be found on the climate impact atlas: http://www.klimaateffectatlas.nl/en/). Global scenarios can be derived from global environmental assessments like IPCC and the Global Environment Outlook [9, 2]. It is important to communicate these complex scenarios in an appealing and clear way to participants, for instance using visualization techniques like realistic photographs, maps or illustrative charts that picture the local neighborhood, city or farmland under alternative plausible circumstances (see Figure 20) [50, 35, 18, 15]. Meteorological officers can support the facilitation of the session by explaining the data and joining group discussions [18]. During policymaking, quantitative scenarios can be of great use for sewer and other construction workers that need to know exact ranges of precipitation rates in order to make the sewage resilient to future climate change impacts. For citizens to become aware of climate change impacts, however, it is often sufficient to explore future changes with semi-quantitative or qualitative tools.

> Option 2: Semi-quantitative tools

Semi-quantitative tools also show plausible future trends but without quantitative extrapolations. This can be a solution when quantitative scenarios are not publicly available. These tools work well if you expect change to happen but it can be in any direction, like for example economic growth. Global trends can be applied to the local context by asking for example: what would these different situations mean for our attempts to implement climate adaptation measures? [4]. Or what would low/high precipitation levels mean for the farmland? Semi-quantitative tools are easier in use than quantitative scenario tools.

> Option 3: Qualitative tools

A wide range of futures can also be explored using more qualitative tools, where participants

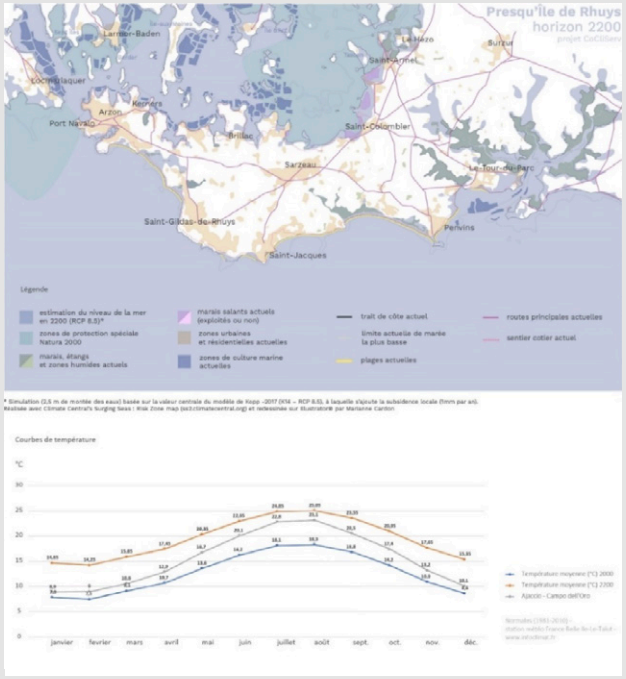


Figure 20. 2200 physical map of the Rhuys Peninsula (Elaborated by Marianne Cardon) [4].

themselves actively work with exploring different possible futures. These tools open the floor for participants to explore *what* change may happen in the future given existing trends or small signals of change [4]. An incremental scenario case study in the Golf of Morbihan, France [4] (p.77-94) used poker design cards with elements of the future and asked participants to pick several cards to explore surprising combinations of situations in the future. It has proven to be a creative tool for people to think more out-of-the-box about what futures are possible [4].

The choice of which exploratory scenario tools to use depends on the targeted participants (which again depends on the goal of participation).

Output examples
The objective of citizen participation in this toolkit is to collectively think about desirable futures as a way to break from negative tendencies. We therefore recommend to use exploratory scenarios not as a stand-alone method but add the concept of desirability with visioning, backcasting or seeds-based pathways (see Table 1).

SUMMARY **EXPLORATORY SCENARIOS** TOOLS

- **Tool 6. Visual maps** (p.38)
  To visualize exploratory scenarios as context material during visioning or pathway development
- **Tool 8. Poker design cards** (p.39)
  To let participants experiment with combinations of future elements and explore surprising futures

Tool 6. Visual maps

LEVEL ORGANIZER: ■■■ LEVEL PARTICIPANT: ■□□
DURATION: 30-60 minutes

What?
Visual GIS maps (e.g. 2D, 3D, fly-over) of the neighborhood, city or rural area under different (climate) scenarios can be used as a tool to stimulate the ability of imagine plausible future situations. Visual maps make use of people's emotional connection to the place and as such bring climate issues to life.

When?
In participatory exercises with exploratory scenarios.

How?
Visual maps of different scenarios and what they could mean for the local situation can be shortly presented by the project organizer or an expert at the beginning of the workshop. Experience shows that also the involvement of a meteorological expert in group discussions enhances the understanding among participants as well as improve credibility and legitimacy of scenario trends. Having an expert explaining exploratory scenarios also supports trust building by potential end-users of climate services, such as citizens and policymakers. The chance that they will use such climate information in the future thereby increases [29; 18].
Also later during visioning and pathway development participants should be able to conduct the information.

Map of a neighborhood in Dordrecht under precipitation levels. Source: [15].

For more information about visual GIS maps, see [15].

Tool 8. Poker design cards

LEVEL ORGANIZER: ■■□ LEVEL PARTICIPANT: ■□□
DURATION: 30-60 minutes

What?
Poker design cards can be used by participants to explore futures based on local citizen narratives collected in early interviews, surveys or focus groups.

When?
In participatory exercises with exploratory scenarios.

How?
Wardekker et al. [4] experimented with poker design cards in the Gulf of Morbihan, France. The cards contained relevant elements of which citizens thought could impact the local context. They were divided in three categories: climatic changes and hazards; infrastructure and territory; and resources and actors. Participants were asked to randomly pick one card of each category and use these to describe possible future situations.

Case study example: poker design cards to explore possible futures in a qualitative way. Source: [4].

Poker design categories	Categories of narratives			
	Geo-social	**Historical**	**Seasonal**	**Climatic effects**
Climatic changes and hazards	· Submersion · Flooding · Erosion	· Drying soils · Sea level rise · Ocean acidification	· Warmer summer and spring periods · Colder winters	· Storms · Heat waves · Droughts
Infrastructure and territory	· First nautical mile · Subsidence · Beaches	· Oyster farms · Coastal pathway · Salt mines	· Second homes · Ports · Water treatment systems	· Historical sites · Urban areas · Routes
Resources and actors	· Island owner · Intra-gulf nautical transport network	· Oyster farmers and farmers · Direct selling · Tourists	· Office of Tourism · Retired population · Seasonal workers	· Measuring instruments · Scientific community

Dimension cards for exploratory scenarios.

For more information about poker design cards, see [4].

4.2 How to conduct a visioning exercise?

Step 1: Imagine a desired future

> Option 1: ***Freely!***

One way to imagine a desirable future is for participants to freely develop visions based on their own imagination – so not guided by questions or using existing examples as inspiration source. Real imagination that deliberates the mind from present-day constraints happens when people are stimulated to use all their senses [32, 38]. Creative tools like Predict Future Headlines and creative collage (see Figure 21) stimulate imagination in a playful way and invite people to freely develop their own desirable future [31, 32, 25, 15]. Creative and artistic tools also set the tone for a relaxed informal sphere in which participants feel safe to be open-minded [31].

Figure 21. Collages as a tool to write down characteristics of a desirable neighborhood in a visioning exercise [4].

> Option 2: ***A bit more guidance***

- Questions about the past
  Sometimes participants need more guidance to be able to imagine the future. One way is to ask guiding questions during the exercise. Visions reflect a future state, yet experience shows that citizens often build their visions on memories and experiences from the past [52]. Therefore, instead of asking *'What will happen to us? How should we respond?',* organizers could ask participants *'What do we need to carry through with us? What should we tend to?'* [19]. There may also be problematic elements in the present that citizens would like to see change in the future. Possible questions to get participants started are: *'Given the trends in our region/city/area – what do we value, what do we see as problematic, and what would we really like to achieve here? Who live and work in the neighborhood, what are their desires? What are vulnerable groups and how to help them? What is already present and what needs improvement? What is missing and what should be added/ removed?'* [25, 4]. Answers on these questions can be written down on post-its to structure the output of the group discussion.
  Organizers can also choose to use a visualization tool called Photovoice. It asks participants prior to the workshop to make pictures of places or issues that are personally relevant [28] which can be further discussed and elaborated on during the visioning exercise.

Box 8. Case study example: free visioning

ToolSust organized a one-day workshop in Stockholm. Firstly, facilitators explained the exercise to participants after which they were asked to travel ahead in time and imagine that they had arrived in 2040, where Stockholm was more sustainable than now (i.e. imaginary visioning). They were asked to describe future daily life. Images were used to stimulate their imagination. After some reflection time participants were asked to write down their impressions.

After this visioning step, the facilitator asked participants to share one of their ideas, put it on labels on the wall and cluster them accordingly. The group discussed on any missing ideas. Then participants were asked to prioritize ideas on highly valued (green dots) or unpopular. The result was a shared vision of what a sustainable city in 2040 should look like in the form of clustered ideas.

- Existing good examples
  Additional inspiration for imagining a positive future can come from sustainable local initiatives that already exist in a different context (see Figure 22). These *seeds* or 'pockets of the future' can serve as examples for participants to identify certain elements, skills or objectives that they would like to see in their own context too [46, 19, 12]. Participants can come up with their own examples of good initiatives, organizers can prepare cards with examples (see Figure 23), or participants can be inspired by existing databases of good examples like the Cities 100: an annual list of the 100 best urban climate change solutions [49].

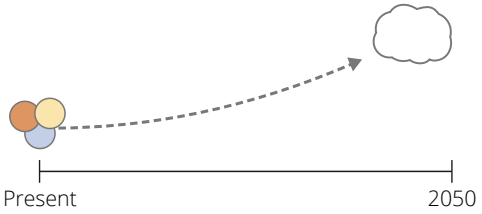


Figure 22. Seeds-based pathways.

Figure 23. Seeds cards as inspiration source [51]

  The Future Wheels technique is a way for participants to envision how individual or innovative combinations of seeds can lead to potentially interesting futures in their neighborhood, city or farmland [19]. For instance, an initiative like a community garden could improve the quality of the neighborhood and give job opportunities while at the same time it helps to adapt to climate change [28, 19, 7].

- Existing citizen narratives
  In the preparation phase we discussed the possibility of conducting interviews, surveys or focus groups to collect citizen narratives and use them as a basis for visioning exercises. Data analysis tools can be used to categorize and structure the large amount of data that is collected with these tools. Categories of citizen narratives can be turned into dimension cards that participants can use as inspiration material during the visioning exercise.

Output examples

The very least result of visioning exercises is that the *process* builds awareness among participants about alternative futures. The following quote illustrates that the value of such creative processes should not be underestimated [53, p. 104]:

> *"Valuable ideas and experiences cannot be easily quantified, are not readily susceptible to planning [...]. Artistic research without a precise goal, loafing as method, claiming non-productive time, extended work processes and slow productions – all are forms of an alternative approach to time that allow for* ***meaning****"*

Creative visioning is an accessible method and effective way to attach meaning to current trends that do not bring us a climate-resilient future and that there are alternatives [29].

In terms of the *product* or content, visioning exercises generate diverse images of the future.

- Post-its can be used to write down concrete aspects of future visions.
- Collages and Predict Future Headlines are both creative ways for participants to visualize their desires for the future.
- Art designs of visioning output can be developed by professional artists that attend the exercise too.
- Poetry or spoken word are a verbal way to communicate visions.

SUMMARY **VISIONING** TOOLS

- **Tool 8. Poker design cards** (p.43)
  To provide participants with inspiration of a better future (based on citizen narratives)
- **Tool 9. Predict Future Headlines** (p.44)
  To let participants develop personal visions in a playful, creative way
- **Tool 10. Creative collage** (p.44)
  To let participants freely visualize alternative futures
  To facilitate interaction and collaboration between different groups of stakeholders (e.g. citizens and policymakers)
- **Tool 11. Photovoice** (p.45)
  To invite participants to make photos of places that are personally relevant as a basis for visioning
- **Tool 12. Future Wheels** (p.45)
  To use local sustainable initiatives as a basis for visioning by imagining them their dominant version and exploring the wider impacts on the local context
- **Tool 13. Post-its** (p.46)
  Allround tool to structure thoughts and ideas during all sorts of visioning exercises
- **Tool 17. Art designs** (p.47)
  To visualize visioning output in an artistic way

Tool 8. Poker design cards

LEVEL ORGANIZER: ■■□ LEVEL PARTICIPANT: ■■□
DURATION: 30-60 minutes

What?
Poker design cards can be used by participants to explore futures based on local citizen narratives collected in early interviews, surveys or focus groups.

When?
In participatory visioning exercises.

How?
Citizen can also narrate about more desirable futures with regards to their local context. Visions of a better future can also be used as content of poker design cards as inspiration source for participants when developing their own visions.

Wardekker et al. [4] focused in Bergen (Norway) on the main challenge to make Bergen climate-resilient in 2050. The visioning exercise started with randomly allocating people to one of three broad visions of Bergen in 2050: control the climate (*a 1.5 degree city*), live with the climate (*let it rain*), or make the most of the climate *(high-tech haven)*. These were prepared in advance based on citizen interviews but left broad with only a title, photo and short mission. Participants were then asked to add more detail using cards with important elements that lend Bergen a sense of place according to interview findings. Participants were free to debate and vote for five cards to add to their vision. Poker design cards have proven to generate lively discussions as well as let the group get used to each other's viewpoint.

1 A compact city	**5** A climate science city	**9** Freeing the waterways	**13** A city linked to nature
2 Climate-proof buildings	**6** Resilient Bergensers	**10** Safe from climate impacts	**14** Diverse and international
3 A port city	**7** A historical city	**11** Rain-friendly spaces in the city	**15** Green spaces in the city
4 Walkways and cycle-ways	**8** A local democracy	**12** Busses, boats and 'bybanen'	**16** Blank card

Dimension cards for visioning exercises.

For more information about poker design cards, see [4].

Tool 9. Predict Future Headlines

LEVEL ORGANIZER: ■■□ LEVEL PARTICIPANT: ■□□
DURATION: 30-60 minutes

What?
This accessible visioning tool invites participants to time-travel to a celebrative future moment in which the neighborhood, city or farmland has turned into a climate-resilient and sustainable place. This tool stimulates participants to expand their sense of time and challenges them to articulate their desired vision with a headline [31].

When?
In participatory visioning exercises.

How?
Participants develop an imaginary newspaper headline as if it was that moment in time. They can use creative material from journals or magazines to visualize their headline.

Predict Future Headlines. Source: [31].

For more information about Predict Future Headlines, see [31].

Tool 10. Creative collage

LEVEL ORGANIZER: ■■□ LEVEL PARTICIPANT: ■□□
DURATION: 30-60 minutes

What?
Collage is a creative visioning tool to structure brainstorm sessions in groups and turn loose ideas about the future into physical output [38]. The tool is easily accessible for people of all ages and cultures and gives a fair chance to people without a dominant voice to share their ideas too [31]. Collages can be a basis for deeper reflection on what actions are needed to achieve the desirable future, for instance in backcasting exercises.

When?
In participatory visioning exercises.

How?
Collages can be made by participants from scratch or designers can develop a template. One case worked with designers that visualized three thematic templates of a future neighborhood: water safe, community-oriented and innovation-oriented [15]. These themes were based on citizen narratives that were collected prior to the workshop [11].
During the workshop, participants can elaborate on these broad visions by using creative material like pictures of trees, people and electric cars to come to a rich detailed vision in the form of a collage. Some out-of-the-box images can be provided to let people get out of their habituated reasoning and stimulate innovative ideas [15].

Collage template. Source: [15].

For more information about creative collage, see [15 & 31].

Tool 11. Photovoice

LEVEL ORGANIZER: ■■□ LEVEL PARTICIPANT: ■□□
DURATION: 30-60 minutes

What?
Photovoice is a tool for citizens to take pictures of local issues or places relevant to them. Photovoice allows underrepresented groups in particular to define their own desires and fears in a visually compelling way. Although requires some efforts prior to the workshop, it is a highly engaging and participatory tool [28].

When?
In participatory visioning exercises.

How?
In visioning exercises, participants can discuss and share their photos with fellow citizens and local policymakers.

Photovoice exercises range from short discussions (e.g. as an introduction to the foresight exercise) to extensive (e.g. as a main exercise, with each participant presenting the images followed by a group discussion).

Pictures of the neighborhood [15].

For more information about Photovoice, see [28].

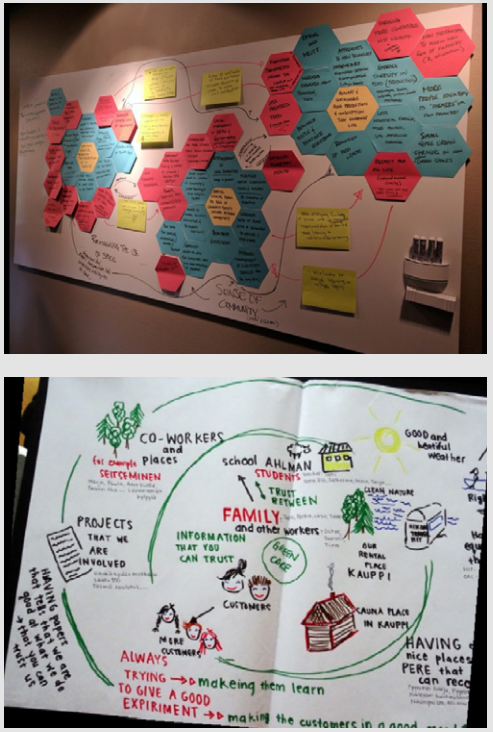
Tool 12. Future wheels

LEVEL ORGANIZER: ■■■ LEVEL PARTICIPANT: ■■■
DURATION: 1-2 hours

What?
The Future Wheels tool can be used to envision seeds in a dominant version of itself, as if it has replaced the dominant status quo. Participants can explore the wider impact that local sustainable initiatives could possibly have on the neighborhood, city or farm.

When?
In participatory visioning exercises.

How?
First, participants choose three different seeds from which future wheels are to be developed [51, 19, 32]. The mature version of these seeds are placed on a blank sheet and form the center of the Future Wheel. Participants then discuss possible direct and indirect effects of this seed on the wider community, neighborhood and/or city) [33, 19]. The later in time these effects are expected to be felt, the further away they are from the center. The STEEP approach (social, technological, economic, environmental and political impacts) can be used to make sure all sorts of impacts are covered.



Future Wheels. Source: [33].

For more information about Future Wheels, see [19, 32, 33 & 51].

Tool 13. Post-its

LEVEL ORGANIZER: ■□□ LEVEL PARTICIPANT: ■□□
DURATION: 30-60 minutes

What?
Post-its turn vague thoughts and ideas into concrete actions or options.

When?
In participatory visioning exercises.

How?
During visioning exercises post-its can structure desires, assets and values into a more coherent vision.

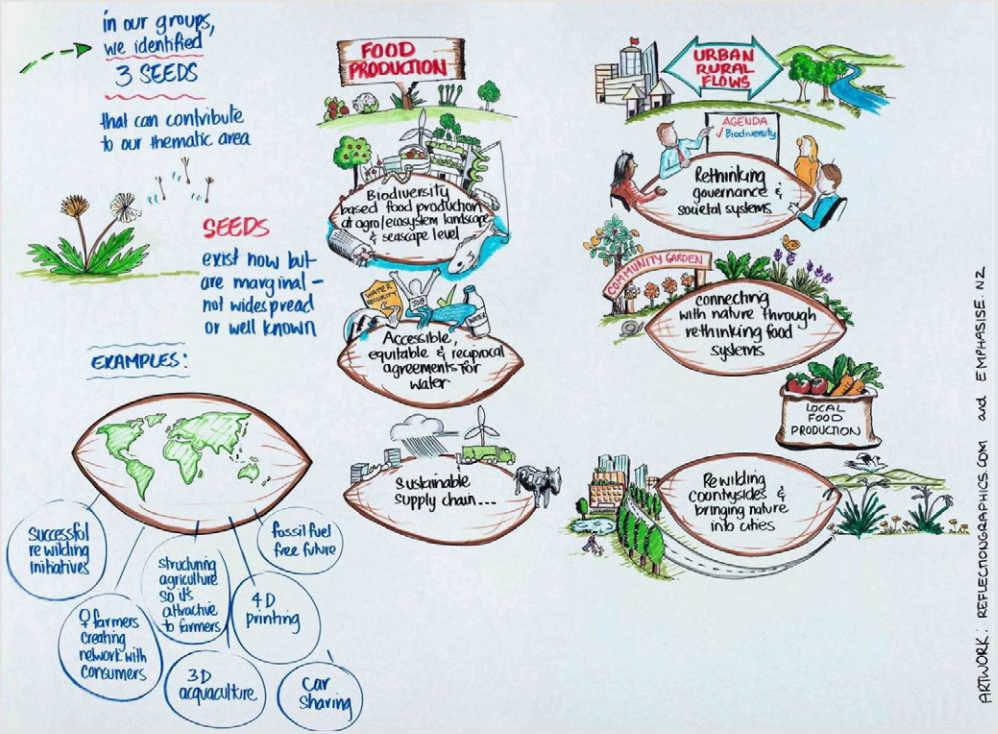
Post-its as visioning result of the CoCliServ Westerstede (Germany) workshop: How does a climate friendly Ammerland look like in 2030? Source: [4].

Tool 17. Art designs

LEVEL ORGANIZER: ■■■ LEVEL PARTICIPANT: ■□□
DURATION: 1-2 hours

What?
During participatory exercises, artistic designers can join the group discussions to translate the output of exercises in a graphic design. For participants it can be rewarding to see their input in a professional design. Art designs can also be used to clearly communicate the information to people that did not attend the exercise.

When?
In participatory visioning exercises.



Graphics of thematic visions. Source: [51]

4.3 How to conduct a regular backcasting exercise?

Step 1: Start with the visioning output

Regular backcasting exercises start with one or multiple visions that result from the visioning exercise (see page 42). Each subgroup of about four participants chooses one vision of the future to work with. When this vision is constructed by other people, it is recommended to first have a group discussion about the legitimacy and relevance of it. It is no problem for subgroups to work with visions that seem mutually exclusive or unrealistic. In fact, when subgroups develop pathways to completely different visions it is interesting material for debate where they overlap, or how they might compete or constitute an obstacle (i.e. hinge-point) to each other [4].

Step 2: Formulate actions

The next step is to formulate adaptation measures, interventions, strategies or actions that are perceived essential by participants to achieve their vision [40, 38]. It can be necessary to provide extra support (e.g. expert knowledge) here, as citizens may feel that they lack sufficient knowledge to conduct backcasting exercises, which often results in less concrete climate actions [43]. Some participants mention the abstractness of the future and the difficulty to divorce themselves from present-day challenges. Especially the structuring questions of: "who will do what, when and why?" requires quite some imagination [23, 4]. If the goal of participation relates to *policy development*, it may be good to consider organizing these exercises with a select group of more experienced citizens (see page 59 for more information on different degrees of participation in the policy process).

Post-its or other creative material can be used to write down these concrete actions.

Step 3: Label and order actions

Each group now has a decent number of ideas to reach its vision. Step 3 is to structure actions on their importance to make participants realize that some actions are truly essential while others are not absolutely necessary to reach their vision. Participants should also think about whether actions need implementation on the short, medium or long-term. Actions can be labelled with different colors.

During this step participants may realize that for some actions to succeed, other actions need to precede **[15].** Such moments of reiteration are important for learning processes of both citizens and policymakers.

Step 4: Discover storylines

Now we have all important actions ordered in sequence of time. The last step is to seek storylines or themes. Actions may for instance relate to social cohesion, health, or a greener place. When all

actions are categorized in themes, participants can identify thematic pathways to their climate-resilient future [15, 51].

Output examples

> Timeline

A timeline can be used to visualize how actions in each theme follow-up on each other and as such create a pathway. Participants can make their own pathways of actions on a blank sheet.

> Art designs

Backcasting output developed by participants can also be visualized by a professional artist. Hebinck et al. [12] designed a cartoon representation of the thematic backcasting pathway of 'food provisioning and health'. Examples of actions are: the municipality only buys green and local; routes on which you can pick fruit are established along the river to connect the urban to the local; and car-free centre, cycling high-ways connected to urban area and peri-urban.

SUMMARY **BACKCASTING** TOOLS

- **Tool 13. Post-its** (p.50)
  To form pathways of actions during backcasting exercises
- **Tool 14. Labelling** (p.50)
  To structure a large amount of actions
- **Tool 15. Storylines** (p.51)
  To categorize actions on common themes
- **Tool 16. Timeline** (p.51)
  To visualize the sequence of implementation over time
- **Tool 17. Art designs** (p.52)
  To turn backcasting output in a visual graphic

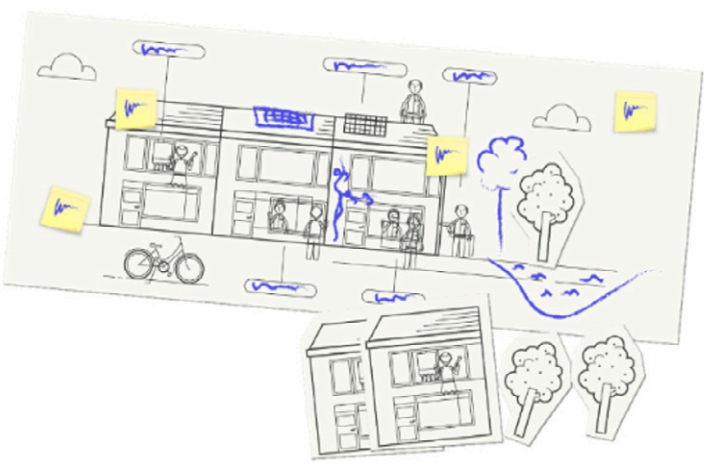
Tool 13. Post-its

LEVEL ORGANIZER: ■□□ LEVEL PARTICIPANT: ■■□
DURATION: 30-60 minutes

What?
Post-its turn vague thoughts and ideas into concrete actions or options.

When?
In participatory backcasting exercises

How?
During regular backcasting exercises concrete actions can be written on post-its to be able to categorize and label them and form pathways.



Post-its to write down necessary actions or measures during visioning and backcasting exercises. Source: [15].

Tool 14. Labelling

LEVEL ORGANIZER: ■■□ LEVEL PARTICIPANT: ■■□
DURATION: 30-60 minutes

What?
The process of brainstorming about possible adaptation actions usually results in a large amount of ideas. Participants can make sense of these actions by labelling them on importance and time of implementation [15].

When?
In participatory backcasting exercises.

How?
They can develop a labelling scheme (for example one green dot means not important, two dots means a bit important and three dots means essential) and label actions that are written on post-its accordingly.

Labelling during visioning and backcasting exercises. Source: [15].

Fore more information about labelling, see [15].

Tool 15. Storylines

LEVEL ORGANIZER: ■■□ LEVEL PARTICIPANT: ■■□
DURATION: 30-60 minutes

What?
A combination of actions that share a common theme and together represent a certain narrative of the future.

When?
In participatory backcasting exercises.

How?
Actions can be characterized on common characteristics (e.g. technical, social, green and/or policy measures). This way, a storyline or pathway of actions can be recognized, for example a social pathway, a green community pathway and a decentralized pathway to a climate-resilient neighborhood that characterizes strong community cohesion [15].

For more information about storylines, see [15].

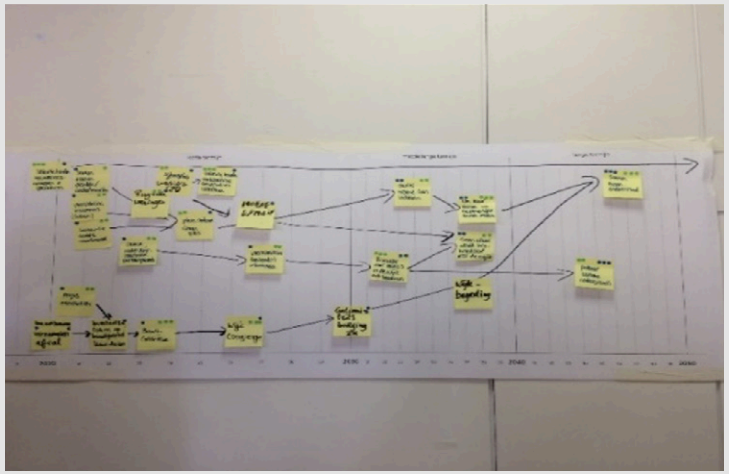
Tool 16. Timeline

LEVEL ORGANIZER: ■■□ LEVEL PARTICIPANT: ■■□
DURATION: 30-60 minutes

What?
Thematic pathways of actions as well as the interaction between them can be clearly visualized on a timeline.

When?
In participatory backcasting exercises.

How?
When participants have decided whether actions require short, medium or long-term implementation, they can be placed in sequence of time: short-term (0-10 years), medium-term (20-30 years) and long-term (30-40 years) [15].



Backcasting pathways of actions. Source: [15].

For more information about backcasting timelines, see [15].

Tool 17. Art designs

LEVEL ORGANIZER: ■■■ LEVEL PARTICIPANT: ■□□
DURATION: 1-2 hours

What?
During participatory exercises, artistic designers can join the group discussions to translate the output of exercises in a graphic design. For participants it can be rewarding to see their input in a professional design. Art designs can also be used to clearly communicate the information to people that did not attend the exercise.

When?
In participatory backcasting exercises.

Cartoon of backcasting pathway. Source: [12].

4.4 How to conduct an incremental backcasting exercise?

Step 1: Start with regular backcasting pathways on a timeline

Incremental backcasting exercises use regular backasting pathways as a basis in order to add the possibility of obstacles that can constrain these actions. The backcasting pathways need to be clearly visualized on a timeline.

Step 2: Imagine what (unexpected) may happen on the way

Numerous crucial, unexpected events (i.e. hinge-points) can happen along a (path)way to a better future. In this step, participants can brainstorm about examples of positive turns or negative constraints that could influence their backcasting pathway. Accordingly, these events can be placed on the timeline. Hinge-points can be internal and controllable (e.g. the construction of a new sewage system), external and uncontrollable (e.g. economic crisis), climate-related (e.g. extreme sea-level rise) or not climate-related (e.g. high unemployment levels). Since these potential events can block the pathway of actions, it is valuable to think about what can be done to keep the plan on track or to develop an alternative pathway of actions [15]. Participants can formulate these alternative pathways of actions and place them on the same timeline.

Output examples

> Timeline

The timeline that resulted from the regular backcasting exercise (see p.49) can be complemented with post-its to show hinge-points and alternative pathways.

SUMMARY **INCREMENTAL BACKCASTING** TOOLS

- **Tool 13. Post-its** (p.54) (on the backcasting timeline (p.49)
  To indicate how potential hinge-points can disturb the pathway to a desired future state

Tool 13. Post-its

LEVEL ORGANIZER: ■■□ LEVEL PARTICIPANT: ■■□
DURATION: 30-60 minutes

What?
Post-its turn vague thoughts and ideas into concrete actions or options.

When?
In participatory incremental backcasting exercises.

How?
Post-its can indicate hinge-points and thus help visualizing incremental scenarios on a timeline. When developing seeds-based pathways, post-its can help visualizing pathways of change and potential enabling and constraining.

Post-its to clarify hinge-points. Source: [15].

4.5 How to develop seeds-based pathways?

Where backcasting pathways start with a vision and go backwards to the present, seeds-based pathways start with an existing sustainability seed and explore how it can grow from the margins to its mature form in the future [33]. The Three Horizons framework walks participants through three phases of time (1=business-as-usual phase, 2=transition phase, 3=sustainable state) to find out which local conditions need to change in order to let sustainable initiatives grow and scale out in their own local context.

Step 1: Select seeds

Participants select a few seeds that contribute to sustainability and that they would like to see in their own neighborhood, city or farmland too. Participants can derive seeds from databases (e.g. Seeds of Good Anthropocenes: https://goodanthropocenes.net/) or come up with their own examples.

Step 2: Explore how these seeds can grow

Horizon 1: Describe the present

The first horizon describes the current situation (i.e. business as usual), which usually characterizes several dominant unsustainable practices in terms of policies, lifestyle and the market. In the present sustainable initiatives exist as well, but they usually operate in the margins with minor impact on the larger system.

Horizon 3: Envision a better future

In Horizon 3, participants envision the seeds in their mature form. What does the future look like if the combination of sustainable practices becomes dominant? Participants also describe unsustainable practices, habits or policies that have declined in this better future.

Horizon 2: Identify obstacles and enabling conditions

The change or transition to a 'new normal' always comes with conflicting interests and hinge-points that arise (e.g. economic crises, conflict over legitimacy of governments). At the same time there will be enabling factors that support the process of change (e.g. banning of cars from the urban center; investments in commons; awareness campaigns). These insights can help citizens and authorities realize what they need to reinforce or change in order for climate plans to become effective in their local context. Participants can even look for connections between the pathways to explore what enables these connections to succeed and produce synergistic and positive outcomes [33].

Output examples

> Three Horizons timeline

The journey of local initiatives to grow from the margins to a dominant version can be visualized in the format of a timeline. Post-its can be used to form the timeline.

> Art designs

When more resources are available, a graphic designer can be asked to summarize the outcomes of the exercise in an attractive cartoon version of a timeline.

SUMMARY **SEEDS-BASED PATHWAYS** TOOLS

- **Tool 13. Post-its** (p.57)
  - To write down elements of the Three Horizons framework
- **Tool 17. Art designs** (p.57)
  - To translate the output in a visual graphic
- **Tool 18. Three Horizons framework** (p.58)
  - To explore ways (enabling conditions and obstacles) in which local sustainability initiatives can grow in the local context.

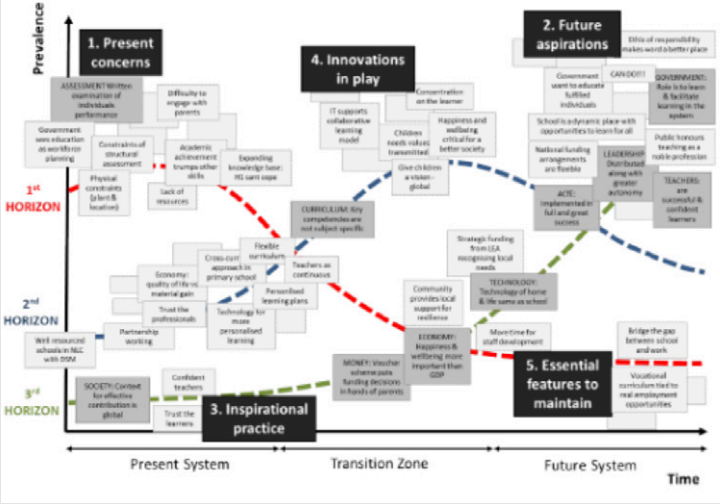
Tool 13. Post-its

LEVEL ORGANIZER: ■■□ LEVEL PARTICIPANT: ■■□
DURATION: 30-60 minutes

What?
Post-its turn vague thoughts and ideas into concrete actions or options.

When?
In participatory exercises with seeds-based pathways.

How?
The journey of local initiatives to grow from the margins to a dominant version can be visualized in the format of a timeline. Post-its can be used to form that timeline.



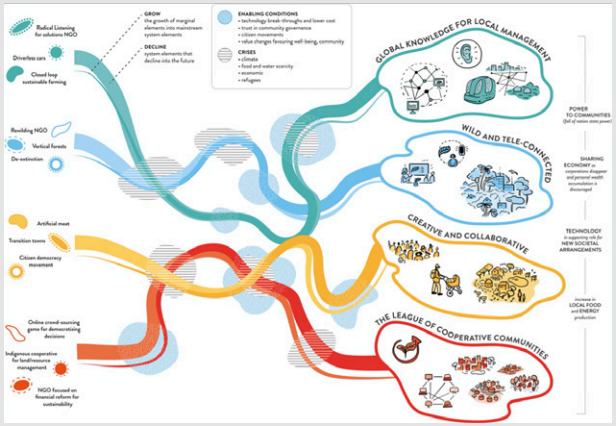
Post-its to create Three Horizons pathways. Source: [56].

Tool 17. Art designs

LEVEL ORGANIZER: ■■■ LEVEL PARTICIPANT: ■□□
DURATION: 1-2 hours

What?
During participatory exercises, artistic designers can join the group discussions to translate the output of exercises in a graphic design. For participants it can be rewarding to see their input in a professional design. Art designs can also be used to clearly communicate the information to people that did not attend the exercise.

When?
In participatory exercises with seeds-based pathways.



Artistic visualization of seeds-based pathways. Source: [33].

Tool 18. Three Horizons framework

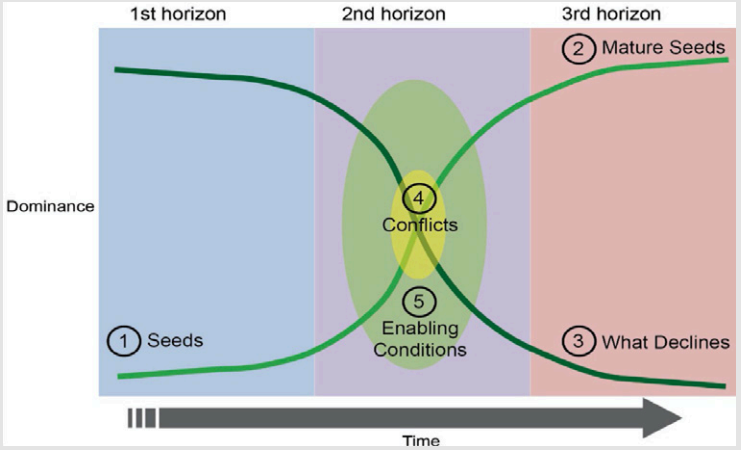
LEVEL ORGANIZER: ■■■ LEVEL PARTICIPANT: ■■■
DURATION: 1-2 hours

What?
With the Three Horizons Framework one can examine positive scenarios for the future, not based on dominant trends but on local sustainable initiatives. The three phases of transitional change help identify what system characteristics need to change to encourage these local initiatives to become dominant [33].

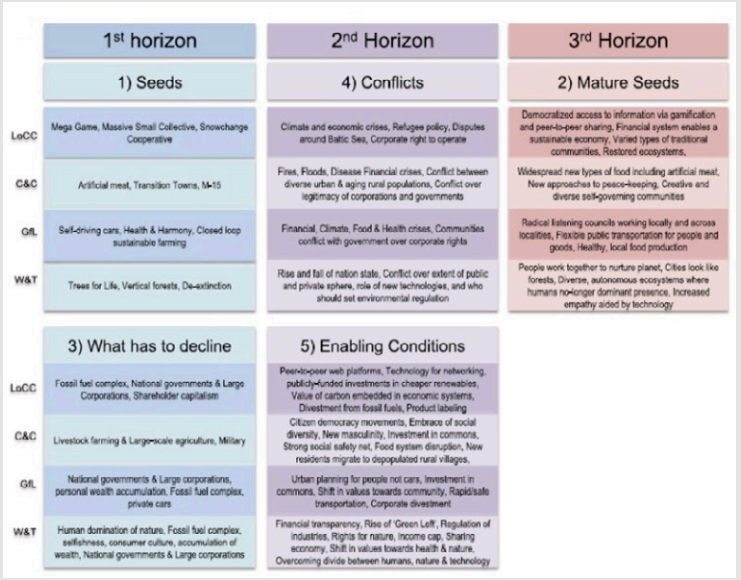
When?
In participatory exercises with seeds-based pathways.

How?
Each group receives or chooses three existing local initiatives, or seeds, that contribute to climate-resiliency. Examples of seeds are Vertical forests (i.e. vertical densification of nature in the city that supports naturalization of large urban and metropolitan borders) and Transition towns (i.e. grassroots community project that contributes to resilience in response to climate change and economic instability). Participants then describe these seeds in their mature form and develop a story of how they grew from the margins to this dominant state. Specific focus should be on current conditions in the local context that declined or grew, what obstacles they encountered and what enabling conditions helped the process [33].

For more information about the Three Horizons Framework, see [33].



Three Horizons. Source: [33].



Participants can work with post-its to write down their ideas and form pathways of change.

Additional guidance

1 Guidance for determining the degree of citizen participation (relevant for Participation goal #1: Policy development)

When the goal of participation is to use citizen knowledge in the *policy development* process, it is important to critically think about the degree of participation: the extent to which participants can have actual impact on policymaking. To explain this, we take a closer look at Arnstein's [34] ladder of citizen participation, which starts at the bottom with forms of tokenism and goes all the way up to citizen power (see Figure 24). The degree of participation strongly depends on the moment of participation in the policy process (see Figure 25) [14]. There are several variations possible here.

We start at the top of the participation ladder (step 6, 7 & 8). Arnstein [34] talks about a meaningful dialogue when citizens can influence climate adaptation and mitigation plans with their input. The best moment for citizens to influence climate resilience plans is in early phases of the policymaking cycle, when the problem definition and approach are still open for discussion (see Figure 25) [38, 14]. Early-phase involvement would avoid the mistake that Carlsson-Kanyama et al. [38, p.44] warns for: "public opinion usually enters into the planning process at such a late stage as to have minor influence on actual outcomes". Participatory exercises with the goal to let citizens influence the content of adaptation plans thus need to organize their exercises before the actual process of decision-making in order to avoid false expectations. It also demands policymakers to be flexible and open to different visions that may steer initial adaptation ideas in an alternative direction. Find more enabling conditions to stimulate policy uptake of citizen knowledge on page 61.

Policymakers can also invite citizens to inform, consult or advice climate plans – forms of participation that are lower on the participation ladder (step 3, 4 & 5) [20, 34]. Citizens can here at most 'respond' to plans – either in early design phases or later in the implementation phase [34, 57]. Authorities may choose this lower degree of participation if they have to deliver certain outcomes and face boundaries within which they can act. Although Arnstein [34] calls a participatory process in which authorities do not share their power with citizens 'a form of tokenism' (see Figure 24), less deliberation of citizen knowledge does not necessarily have to be a problem.

We move back again to the policymaking cycle (Figure 25) to show that it is more a question of who to involve to what degree, when. In the phase of problem identification a large group of citizens can easily be involved [14] but later policy phases may require more managerial, technical and

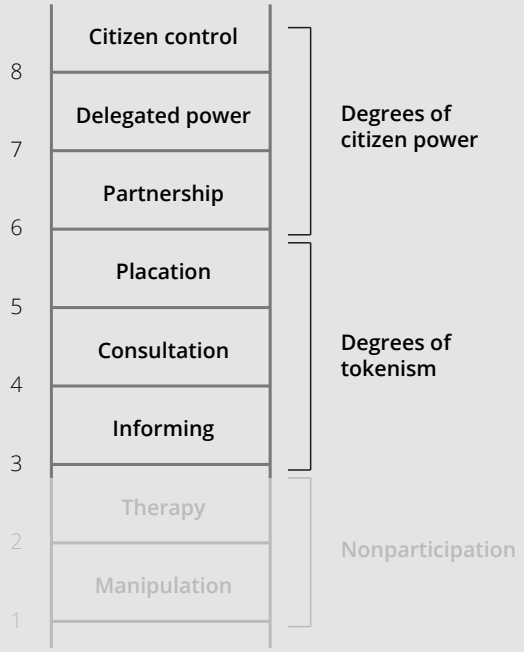


Figure 24. Participation Ladder [34].

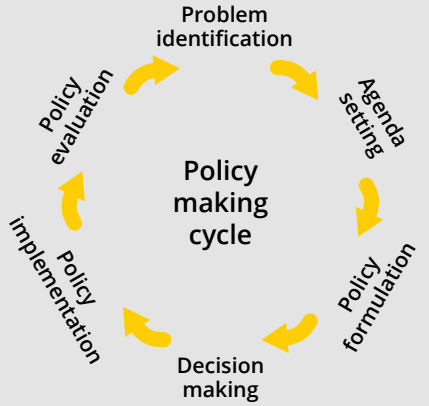


Figure 25. The policy making cycle. Source: [65].

expert knowledge to be able to develop effective plans [4]. Not all citizens feel equally qualified to participate in all methods (e.g. regular and incremental backcasting are sometimes experienced as challenging) and not all phases lend themselves for citizen input. Organizers may at most ask a few skilled citizens to participate. As soon as plans have been developed into a first version, a broader more representative group of citizens can be asked to respond. This can be in short a neighborhood workshop or community evening [14]. Organizers can thus choose various degrees of participation in different moments of the policymaking process [4]. Participatory exercises with a *policy development* goal or a *knowledge and capacity development* goal in particular benefit from multiple moments of participation to collect different types of knowledge from diverse groups of citizens.

It is important to consider these variations when inviting people to participate in the exercise. Transparency and clarity about how citizen knowledge will be used avoids raising false expectations about the impact of the participatory exercise [21, 17]. This is essential for trust building and further collaboration between authorities and citizens [17].

2 Guidance for feeding citizen knowledge in policy processes (relevant for Participation goal #1: Policy development)

The focus of participatory exercises with a *policy development* goal can be on 1) the *process* of the exercise, to raise awareness on climate change impacts or to gain public support for the implementation of adaptation plans. Participatory foresight exercises can also be organized in early policymaking phases to use the 2) *product* (e.g. visions, pathways) in municipal adaptation planning [57]. However, translating citizen output effectively into policy action is often a challenge [23, 58]. Without the support and institutional connections of policymakers, effective policy uptake is often low [24, 25]. To make results useful to policymakers, we first need to understand obstacles and enabling conditions that could influence the uptake of citizen output in municipal adaptation planning.

What are potential obstacles?

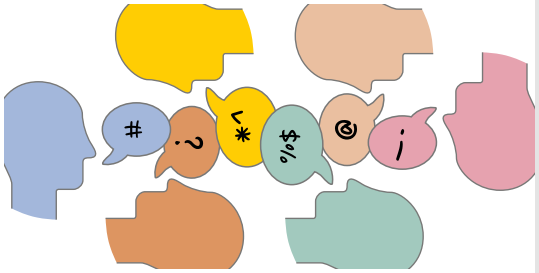
It is not easy to use input of citizens obtained in participatory foresight exercises in actual policy making processes. Constraining factors relate to different standpoints of citizens and policymakers, as well as the difficulty of dealing with an uncertain future [22]. To illustrate, citizens may envision a neighborhood that is highly climate adaptive with promising innovative aspects, while policymakers prefer to stick to a steady status quo or are somehow bound within the municipal organization [6]. For this reason, Vervoort and Mangnus [23] raise the importance to maintain a balance between the experiential and the analytical when developing output for improving policymaking. A combination of foresight methods to develop long-term desirable visions that are also feasible in terms of short, medium and long-term actions is a first step to overcome these obstacles.

How to stimulate policy uptake?

To increase the chance that citizen visions and pathways of actions find their way in policy processes, participatory exercises should gain political authority first – that is, when local policymakers perceive it as salient (i.e. relevant), credible and legitimate [58, from 59]. It takes good communication, translation and mediation in participatory exercises to enhance the political authority of citizen output [59].

Communication

Meaningful dialogue between authorities and citizens is *the basis to build mutual trust* [59]. At the same time this valuable and interactive form of communication *requires mutual trust* [15, 24]. In many cases we see that mutual trust is lacking. It is therefore essential that policymakers are willing to extend the notion of 'expert' in policymaking and recognize citizen knowledge as valuable and useful information [5].

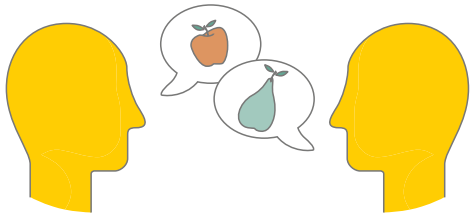


Also related to communication is to make sure citizen output is in line with the political agenda or interests of policymakers, or else it will be easily ignored. To make sure that output is relevant for policymakers, their participation in the exercise is highly recommended [24, 14]: research shows that engaged policymakers tend to perceive outcomes as more legitimate, credible and salient than those who are absent [25, 59].

It helps to have a window of opportunity to maximize the usefulness of participatory foresight exercises to policymakers [23]. Planned urban renewal such as the reconstruction of a sewage system, new houses that will be built or the renovation of public space are good moments for citizens to join the process from the beginning [15]. Participation output can more easily be integrated in the policy process than if an exercise does not link to a specific event in time [24].

Translation

Even though there may be mutual trust and communication – authorities and citizens often have different perspectives, priorities and may speak in their own jargon when they meet. Mutual understanding of events or phenomena can be facilitated by translating information to a common language that both citizens and policymakers perceive as relevant, credible and legitimate [22, 59].



Visualizations can translate complex climate information in an understandable way and stimulate learning among participants. For instance, local landscape visualizations bridge the gap between formal models and local realities as it links to people's attachment to place and community identity [35]. In the policymaking process, visualizations can support the communication of environmental scenarios and potential consequences for adaptation and mitigation plans. For example, policymakers can formulate adaptation measures under scenario A, followed by scenario B and then

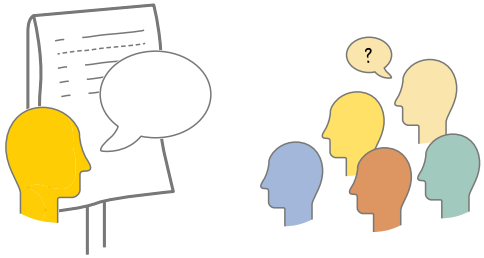
"The [CoCliServ] workshop has shown that for collective climate adaptation efforts to be successful, there is a strong need for trust-building between citizens and local governments."

Mandy van den Ende – Junior Researcher (Utrecht University)

discuss which measures would be useful in both scenarios to maximize the robustness of plans [23, 54]. The perceived credibility of visualization tools is generally high [25].

Mediation

Mediation by an external party can facilitate the communication between participants and the translation of information. External facilitators are also in a better position to find overlap in perspectives and bridge interests of citizens and authorities. They can even help to plan follow-up activities with policymakers to ensure the participatory exercises find some institutionalization in the policy process.



The exact role of facilitators depends on the foresight method used in the exercise as well as on the goal of participation. They should keep in mind what output they want to get from the exercise. For instance, facilitators should encourage out-of-the-box thinking during visioning exercises or if the goal is to enhance awareness about radically different or transformative futures. Yet when the goal is to inform policy, they may need more specific output. If they are completely non-interventionistic here and allow groups to discuss freely rather than trying them to finish one issue, output may become less useful for policymakers [29, 25]. Bahadur and Tanner [6, p. 202] emphasize the need to "reflect on what precisely it is that is being made resilient [visioning], in the face of which specific dynamics [exploratory scenarios], [...] and by what criteria this is good or bad [visioning]". This can then be followed by the "who will do what, when and why" question [29] – which may better be answered by policymakers themselves.

Learn from peers!

1 Urban case

Participatory foresight workshop in Dordrecht, an urban delta city in the Netherlands

Wardekker et al. [4] organized a participatory foresight workshop in the city of Dordrecht – an urban delta in The Netherlands. Dordrecht is highly vulnerable to weather, water and climate due to its geographical location: under sea-level, close to the sea and surrounded by rivers. The municipality formulated an ambition of a climate-resilient city in 2040 and sees an important role for citizens. Yet the question remains what exactly a climate-resilient city means and what is needed to reach it. A workshop has been organized for citizens, policymakers and scientists in order to collectively think about this.

1 Why participation?

Wardekker et al. [15, p.7] aimed to generate "policy scenarios that explore how local communities might reach the future they desire and what kind(s) of information might be helpful to them (at different moments) in that process". The reason for citizen participation was 1) **to include interests, fears and dreams of local residents in a neighborhood adaptation plan** *[policy development goal];* 2) **to provide a space where citizens and authorities engage** *[community building goal];* and 3) **to explore the need for new climate services** *[knowledge and capacity goal].*

2 Who to involve?

Relevant stakeholders in this case study were local citizens of a specific neighborhood in Dordrecht, local policymakers and scientists.

Prior to the workshop, Marschutz and Wardekker [13] went into the neighborhood to meet citizens and hear their stories in the form of informal talks, interviews and focus groups. As such, they were able to gain a broad idea of community thoughts and desires with regards to making the neighborhood climate-resilient. Their regular appearance in the neighborhood also enhanced trust-building. The expectation was that based on this trust and familiarity, citizens would also sign up for the participatory foresight workshop. The local community center promoted the workshop and citizens were contacted by the researchers. However, there were a couple of factors that resulted in a low participation rate. Some community workers that were present said that a full-day workshop as well as the location, outside the neighborhood, discouraged other citizens to attend. Citizens also indicated to distrust the local government.

Therefore, another short evening session will be organized in the neighborhood to ask a larger group of citizens for more concrete follow-up actions. A more representative group of citizens is particularly important to make sure a diverse group of perspectives is heard in policy processes *(i.e. the policy development goal).*

A third workshop will be organized to elaborate on the initial backcasting results from the first workshop and identify climate services with only the end-users: climate experts, authorities and community representatives *(i.e. the knowledge and capacity building goal).*

3 What foresight methods to use?

4 How to use these foresight methods?

Exploratory scenarios

Wardekker et al. [4] used **downscaled climate scenarios** in several ways. First, a national meteorological expert presented a publicly available database with quantitative historic, present and future climate data [60, 61, 62]. With this presentation in mind, the first question that the project organizers asked to participants was *'what means weather/water/climate to the neighborhood and the future?'.*

There was a laptop available with a spreadsheet of climate data and a page with 3D fly-over maps of the neighborhood with information about flood risks and heat stress under two different scenarios. Participants used the quantitative climate database and visual fly-over maps during the visioning exercise and while formulating potential future hinge-points, as the scenarios provided insights

Photos: ©Marjolein Pijnappels, Studio Lakmoes

about impacts that are out of local control (e.g. extreme sea-level rise) but could affect the effectiveness of interventions. Participants and policymakers indicated the usefulness of climate data during the exercise [15].

Visioning

Before the exercise, Marschutz [11] collected narratives of local stakeholders about how they would like to see their neighborhood in the future. The result was **a shared vision** of a resilient island based on which Wardekker et al. [4] developed three sub-visions to elaborate on: strong island community, innovative connections and water safe and water wise.

During the visioning exercise, each group of participants received an illustrated XL-card of a street created by graphic designers. Participants were asked to **visualize their ideal future with creative material**. Post its were used to write down concrete measures needed to achieve the vision. The result of the visioning exercise were two collages of **a desired climate-resilient neighborhood**. Participants wanted more green and trees in the neighborhood to reduce heat stress but also to strengthen community cohesion. They would also like to have community gardens to take care of. At the same time enough parking space is important for citizens. These ideas were used as a starting point for developing backcasting pathways.

Regular backcasting

In the visioning exercise participants already named a few **actions to achieve the desired neighborhood**. In the backcasting exercise, all actions were written down on a second set of post-its and the following questions were asked: 'how essential are these measures' and 'when in time should they be implemented'? Participants answered these questions for each measure and marked them accordingly.

The next step was to place these measures on a timeline and identify **routes or pathways of measures** that belong to each other. They found a pathway of social measures and green measures.

Incremental backcasting

The group was asked to think **about critical moments that could influence the measures**. Participants mentioned a financial crisis, the reconstruction of a street, expensive energy and extreme weather events like hot summers and extreme rainfall. These moments could either support the implementation or constrain the effectiveness of adaptation measures. Another possible constrain for the neighborhood to become climate-resilient in 2050 is a lack of community support and awareness about climate change impacts.

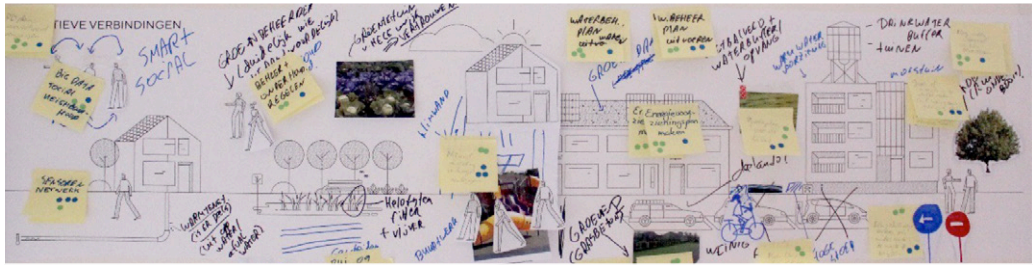


Photo: ©Mandy van den Ende, Utrecht University.

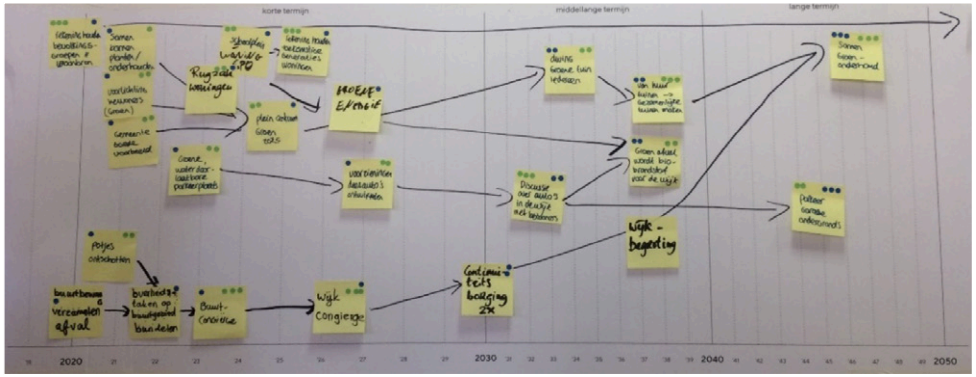


Photo: ©Mandy van den Ende, Utrecht University.

As a last step, scientists asked participants what exact information they would need to anticipate the constraints and continue the implementation of measures. One citizen proposed to develop posters of the neighborhood under different scenarios (e.g. with or without trees and different temperatures). Visualizations of potential futures are in this case a climate service need that could raise awareness and public support for adaptation plans [15].

Photo: ©Marjolein Pijnappels, Studio Lakmoes

2 Rural case

A Climate Strategy for Honduran Agriculture

Honduras is one of the most climate-affected countries in the world. Honduras' agriculture sector, the backbone of the economy, is extremely vulnerable to climate variability and change. Bad weather conditions and fungus from increasing temperatures are already tormenting farmers by crippling yields and profits from the previously successful coffee and banana plantations. To face these challenges, the government needs to work together with a wide range of different people and organizations to come up with transformative new strategies that lead to action.

In line with this thinking, a national workshop was held in one of the two most vulnerable regions of Honduras, Choluteca, to test and thoroughly revise a draft climate strategy by the Secretariat of Agriculture and Livestock using future scenarios. The "Strategy for risk management and climate change adaptation for the sector of agriculture and livestock" was tested against country-based socio-economic and environmental scenarios combined with climate impacts on the agricultural sector [64].

1 Why participation?

In this example, the need for wider participation was taken very seriously by the national government, who were interested in developing a national strategy that reflected the needs of all who might be hit by climate change *[policy development goal].* This need for integrated strategy and action regarding the rural sector also meant that scenario-guided policy formulation offered an opportunity for developing new links between people across different parts of society, and across different scales *[community building goal];* and the development of new capacities around scenario-guided planning in an integrated manner among all these societal groups *[knowledge and capacity goal].* What was really unique about this process is that the government was extremely open to having their ideas about the national strategy challenged by diverse societal perspectives. As a result, many parts of the national strategy were deeply revised, and an entire section on longer-term adaptation was added before the strategy was finalized and accepted by the government for implementation. The Honduran President later commented that he 'could hear the voices of the farmers' in the final strategy.

2 Who to involve?

Relevant stakeholders in this case were very diverse – including many different types of farmers (large-scale and small-scale farmers), people from various branches of the Honduran government, other private sector actors, civil society organizations, and academics.

> *'Despite a tumultuous start, with original key stakeholders leaving the Secretariat of Agriculture and Livestock, we were finally able to bring everyone together in September for a workshop'* says Marieke Veeger, scientist at the University for International Cooperation in Costa Rica, in her role as Scenarios Coordinator for Latin America for CCAFS [64].

Despite initial disturbances in the organization because of personnel changes in the government, the process was able to bring all these people together – and key in doing this was the very strong relationship between CCAFS regional team (Ana Maria Loboguerrero as CCAFS Regional Program Leader and Deissy Martinez as Science Officer) and the Honduran government, since they had been working together on many projects. **The Honduran government team, moreover, were uniquely open, flexible, and interested in truly inclusive participation and the use of new scenario methods**. Because of this, the timing of the workshop was perfect – the new strategy had been developed into a basic draft, but everything was still up to be changed and improved. Everyone coming knew they would be getting an opportunity to profoundly impact the strategy, and thereby, future government action. This meant that all the conditions were right for scenario-guided policy formulation. The workshop was also organized in a rural center, away from the capital, to put the participants in the heart of the action. Marieke Veeger as CCAFS Regional Scenarios Coordinator led the process. The University of Oxford's global scenario team led by Joost Vervoort offered methodological support.

> Process coordinator Marieke Veeger (CCAFS): '*Success is many times dependent on good timing, something you might not be able to influence. But we have found that building the right relationships with key influential stakeholders and getting them to participate in the workshops is crucial in order for policies to change. Also, making sure that there is a plan or policy ready to be tested, which will be implemented regardless of the Scenario activities, is also key in order to achieve traction.* [64].

3 What foresight methods to use? &
4 How to use these foresight methods?

Preparing the scenario analysis

Contrary to the Dordrecht city planning example, in this case, the foresight process was entirely developed around an **on-going government strategy development** activity. This means that in a sense, there was already a draft vision on the table – **it was the job of those in the workshop to critique, expand and improve the vision and the steps toward reaching it**. Because of this, **the workshop focused primarily on the use of exploratory scenarios as a testing tool for the strategy**.

Before the scenario analysis could start, however, on day 1 of this 2 day workshop, participants had to familiarize themselves with the ideas in the strategy. The group of around 40 participants divided into thematic groups, each of which selected a part of the strategy to closely investigate. The thematic groups read the strategy, and already provided a first round of comments and suggestions. This was helpful, because when the scenarios were used in the second round of reviews, it was very clear that they brought up very different

Organizing key issues for the scenario framing. Photo: ©Marieke Veeger.

recommendations depending on the scenario. Furthermore, this first assessment helped identify the key issues that the scenarios should address to make them relevant for the analysis of the strategy.

Exploratory scenarios

Another element that made this process different from the Dordrecht case is that scenario development was based on pre-existing scenarios for the Central American region. These scenarios were developed by the CCAFS program, in another participatory foresight process with experts and stakeholders from across Central America (including, importantly, some of the people in this workshop in Honduras!). The Central American scenarios were very important because they offered a regional context for the Honduran situation, and a link to things happening globally. There was also some modelling work available that offered quantitative scenario information about the future availability of crops, land and other aspects.

Regional scenarios for Central America formed the basis for scenarios focused on Honduras [64].

On day 2, four new groups were created, with a different mix of people from the different thematic groups. Each of these groups focused on one of the Central American scenarios, and considered, how would this scenario play out in Honduras? They first created a description of the Honduran version of the scenario for 2050; then used back-casting, not for goal-setting, but to create a reverse storyline to connect the scenario to the present. Finally, they used a list of all the issues considered important for the national strategy from the first day to flesh out the details of the scenario.

Scenario-based policy analysis

By now, each of the four groups had deep familiarity with the down-scaled, Honduran scenario they had created. Now, each group received copies of the strategy, with additions made by the theme groups in the first day. Each of the scenario groups was asked to evaluate, in great detail, this entire new draft of the strategy from the perspective of their specific scenario. **Would the different elements of the strategy work in this scenario? If not, why not? What aspects of the strategy were still too vague, not concrete enough, not thought out? What aspects of the strategy were most vulnerable?** And importantly, **how could these vulnerabilities and gaps be improved to make the plan more robust and actionable?**

Because this analysis was happening from the perspectives of four different scenarios, each group came up with original, diverse insights to help improve the strategy. By discussing the different insights from the different scenario-based analysis, common recommendations emerged, leading to fundamental expansions and improvements to the strategy.

> *"It quickly became very clear that the strategy had to be diversified, and include other types of livelihoods, such as cattle and poultry businesses too. Participants also suggested to include territorial planning in its objectives to guarantee most fertile lands for agriculture, since several of the scenarios showed drastic urban expansion"* says Marieke Veeger.

'I was really happy to see that the participants, some of whom had led the strategy work themselves, were so open to the suggested changes. That is not always a given in this work," explains Marieke Veeger. "What's good about the Scenarios work is that it can really help policy-makers strengthen a current plan or policy, without requiring too much time and effort from them. I believe that is what our partners find the most attractive.'

Next to the finalization of the national climate strategy, the successful collaboration and use of scenario planning between CCAFS, the Honduran government and a range of other organizations led to a number of new collaborations on other national strategies.

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