Designing Urban Transformation Programs:

LIFE Urban Adapt

City of Rotterdam

Index

Introduction

Cities need to address tough challenges like climate adaptation and luckily: they do. In cities people, economic activities and all types of energy, material and data flows come together in a growing, dense mixture. This gives rise to large ecological, economic, social and spatial challenges. But exactly because all these challenges and interests come together in one physical place, opportunities for integral solutions surface.

These cannot be forced from city hall. Instead they require a different, more flexible, approach. An entrepreneurial type of governance in which the government plays an active, goal setting role in such a way that broader coalitions of city makers are created. Such an approach requires experimentation, learning and spreading the learnings and relies on good examples.

In the LIFE project 'Urban Adapt', the City of Rotterdam embarked on a number of design processes together with other stakeholders. These range from repurposing unused quays to novel underground drainage infrastructure to water retention in parks with smart barrels. In depth comparison of the lessons, phases, principles and key roles results in the generic approach, or blueprint, for urban adaptation design measures presented in this chapter.

This blueprint is further illustrated in the subsequent 'River' and 'City' chapters. Rotterdam and other cities can use the blueprint to make their cities climate proof. Given the focus on the process instead of the technical measures, these insights may also proof useful for other urban challenges. The main results are presented in this Urban Adapt section.

Adaptation: a triple challenge

Responsibilities: Cities need resilient solutions to deal with the growing risks of overflowing of water systems, heat stress and to enhance ecological quality. These solutions not only stress the performance and qualities of water and spatial interventions but also imply a different way of working. The government cites resilience as its reason for increasingly expecting citizens and other stakeholders to actively contribute with everyone doing their bit, in their own specific ways[1]. This immediately raises questions about sharing and shifting of responsibilities.

The stakeholders and their responsibilities differ depending on the location in the city (see page 13). On the river banks, stakeholders are primarily professional public stakeholders like the municipality, port authority, water companies, etc. The urban areas consist of public spaces where the municipality carries the prime responsibility (but with direct consequences for residents) and private spaces like houses and backyards.

Design: Designs for urban adaptation lead to a new measures and relations between, blue (water), green and orange (built environment) areas, both on and below the surface. As more stakeholders are needed for good quality, acceptable and legitimate designs also the social dimension of design, and hence the design process changes. This poses new, creative challenges for urban designers.

[2] Professor in the ethics of water engineering Van Doorn in her inaugural speech (2018)

Transition: Over time the experiments with new responsibilities and design need to lead to a more general urban transition well beyond pilot projects. Experiments are easier in places that favour innovation: for example where vested interests and procedures are less stringent or where different priorities exist. What works in an experiment, does not automatically scale up to more mainstream locations less favourable to innovation.

   Projects in these locations can turn out less innovative but tell the municipality more about what needs to change in standardized procedures and what the potential is for scaling up innovations.

Blueprint:

In part, the urban adapt approach features plain good process management: early engagement with stakeholders, discovering individual stakeholder's interests, creating process milestones, developing coalitions, aligning individual projects with overarching concepts and agenda's, etc. What sets the approach apart are its blend of design thinking, transition management and entrepreneurial strategies. These are apparent in the following five characteristics:

1. **Initiators: senior policy makers or residents who dare to work outside existing organizations, know their way and connect personally and on a shared ambition**

2. **Frame: going beyond acknowledging different interests by creating a frame in which different interests complement instead of conflict with each other**

3. **Design: using design thinking throughout not just to expand the creative space but also to iteratively and quickly make things concrete**
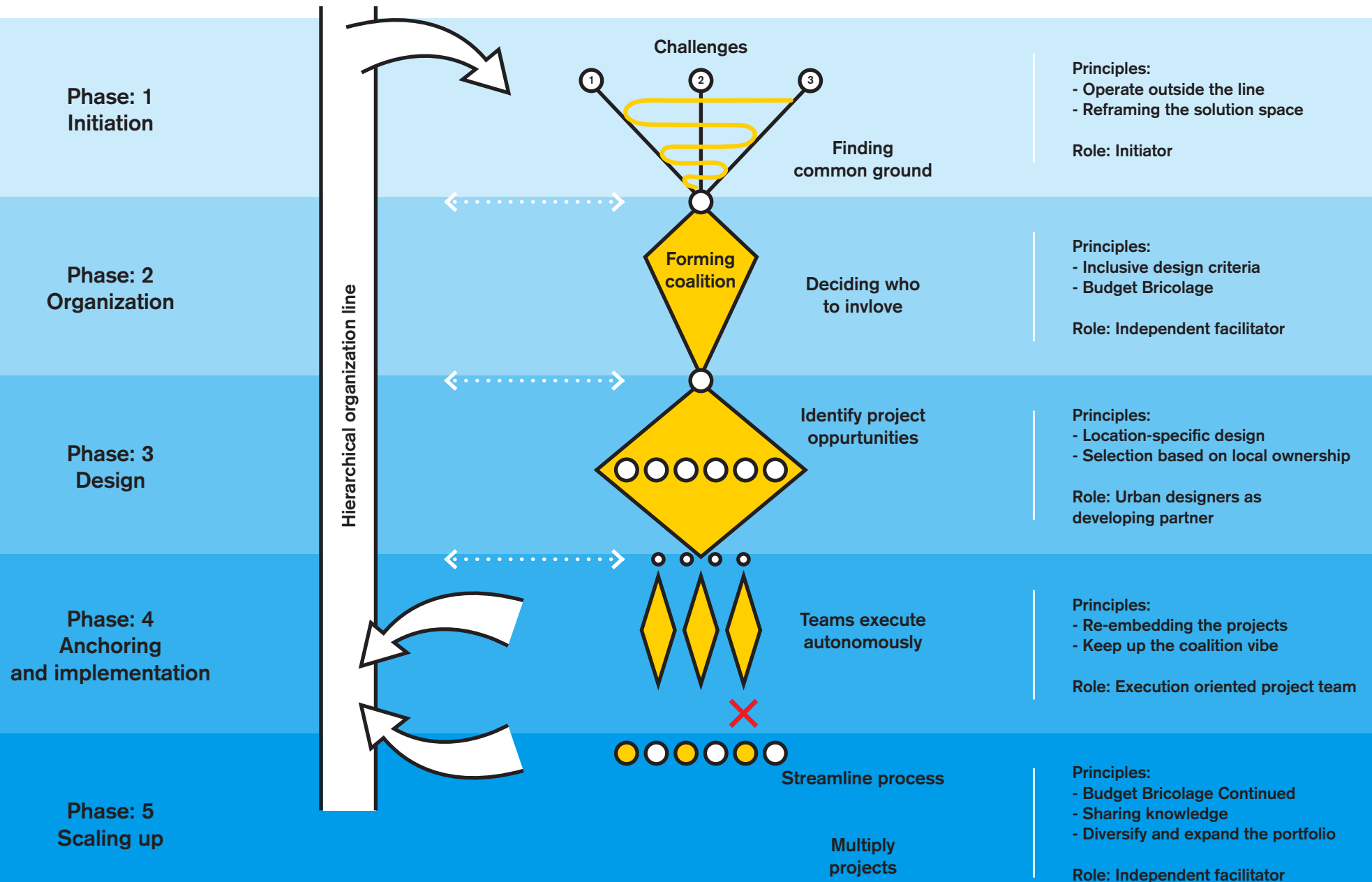
4. **Pragmatic approach to feasibility:** focus on projects with local acceptance or ownership and step by step funding

5. **Entrepreneurial governance:** the aim is optimal interaction between stakeholders to design and realize urban interventions. Not bureaucratic procedures. Organize as light as possible according to the resources needed at specific times, be they funding, political support or otherwise.

The blueprint consists of five phases: initiation, organization, design, implementation and anchoring and scaling-up. Each phase is characterized by lead roles and key guiding principles (see next page). Additional principles and roles can be added for a more programmatic set up or to enable active participation of local residents. In the 'River' and 'City' chapters, these roles and principles are explained.
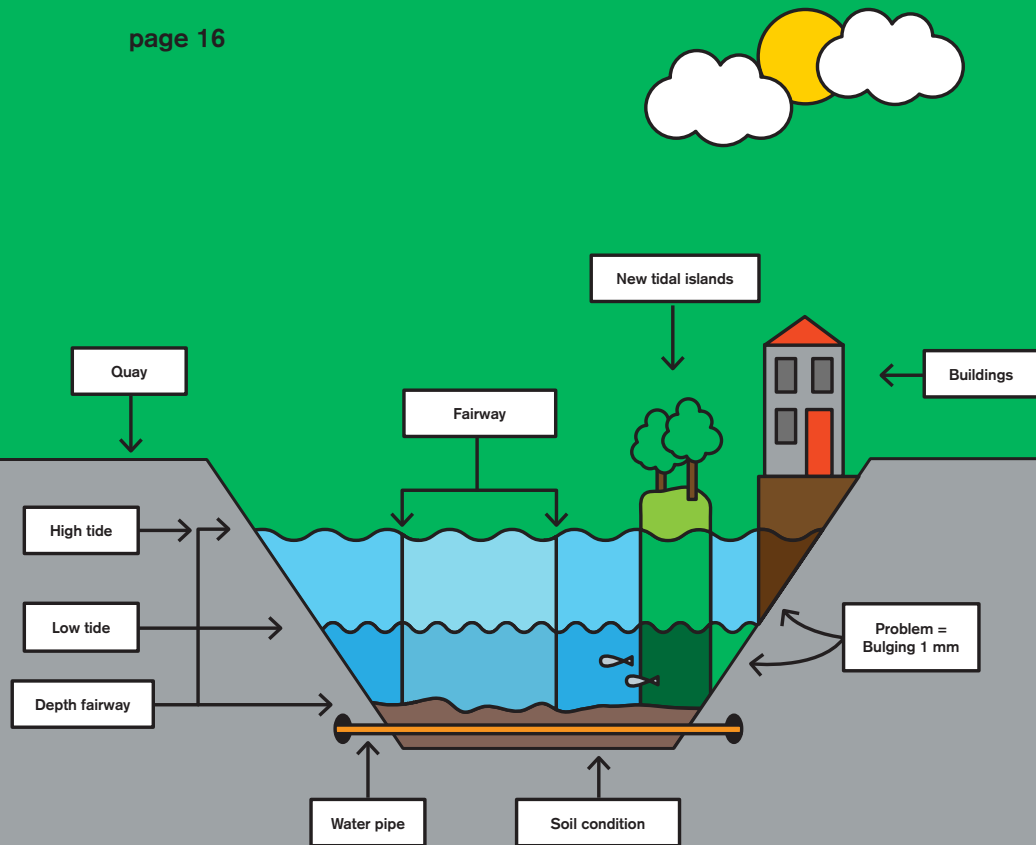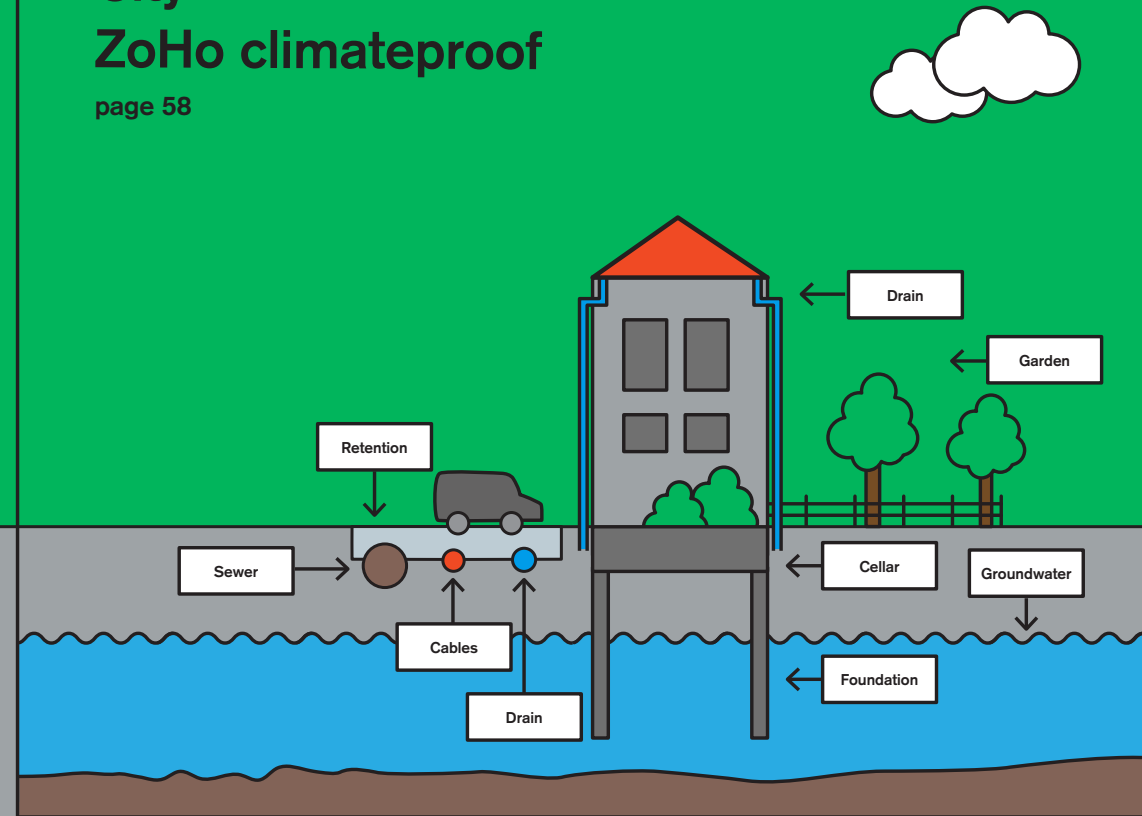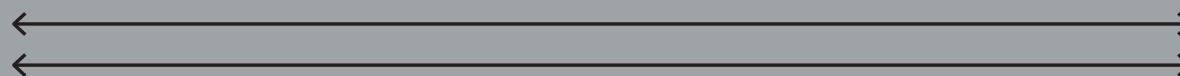
Overview of the process

Phase: 1
Initiation

Phase: 2
Organization

Phase: 3
Design

Phase: 4
Anchoring
and implementation

Phase: 5
Scaling up

Hierarchical organization line

Challenges

1 2 3

Finding
common ground

Forming
coalition

Deciding who
to invlove

Identify project
oppurtunities

Teams execute
autonomously

Streamline process

Multiply
projects

Principles:
- Operate outside the line
- Reframing the solution space

Role: Initiator

Principles:
- Inclusive design criteria
- Budget Bricolage

Role: Independent facilitator

Principles:
- Location-specific design
- Selection based on local ownership

Role: Urban designers as
developing partner

Principles:
- Re-embedding the projects
- Keep up the coalition vibe

Role: Execution oriented project team

Principles:
- Budget Bricolage Continued
- Sharing knowledge
- Diversify and expand the portfolio

Role: Independent facilitator

Cases

River as a Tidal Park

page 16

Quay

New tidal islands

Buildings

Fairway

High tide

Low tide

Depth fairway

Problem = Bulging 1 mm

Water pipe

Soil condition

City ZoHo climateproof

page 58

Drain

Garden

Retention

Sewer

Cables

Drain

Cellar

Groundwater

Foundation

Primarily public responsibility ← → **Primarily private responsibility**

Limited vested interests ← → **Large vested interests**

Cases:

The blueprint is based on document analysis and 15-20 interviews with diverse stakeholders from the cases. The cases are:

River, as a tidal park

This program was set up to re-imagine and transform old quays and banks of the Maas. Within this program a range of projects were explored or executed. Due to the program approach, this is the only case with explicit scaling up ambitions.

Executed and financed within LIFE Urban Adapt
- Keilehaven
- Nassauhaven

Scouted or executed but not financed within LIFE Urban Adapt:
Maashaven, Maasboulevard, Eland van Brienenoord, Huys ten Donck, De Esch, Groene Poort Noord, Oeverbos-Krabbeplas

Inspired by LIFE Urban Adapt: Rijnhaven, Parkhaven, Wilhelminahaven (Schiedam), Yard (Dordrecht), Buizengat

City, climate proof ZoHo

The ZoHo district is an inner city district with mixed residential and commercial functions. The actions in this district where not part of a program.

In depth analysis
- Vijverhofstraat
- Heliport

Other actions part of Urban Adapt are the Raingarden, Rainaway Garden, Katshoek (not implemented) and Hofbogen (not implemented)

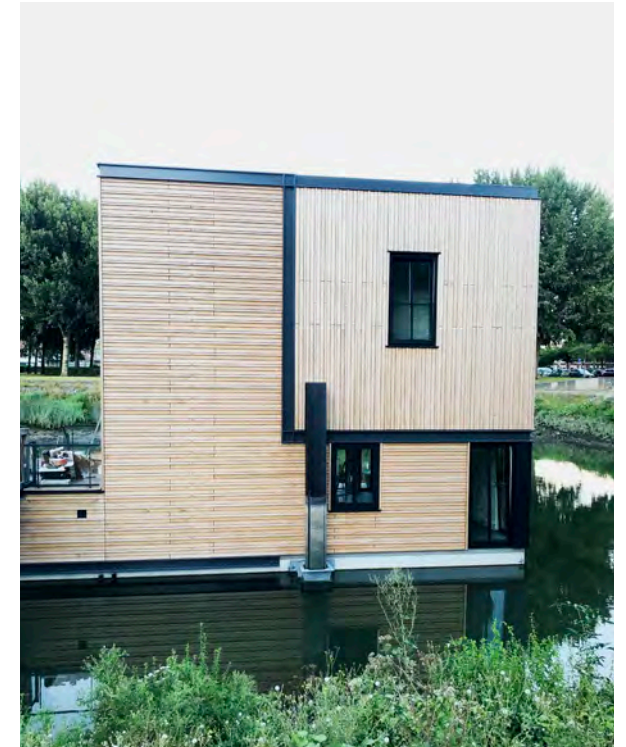|	River as a tidal park	Vijverhofstraat	Heliport
Program	Yes	No	No
Context	Niche	More mainstream	Niche
Initiators	Public actors	Municipality	Residents
Initial type of participation	Invited	Oppositional, later invited	Self-organized
Need for implementation and acceptance	Low	High	Medium

The cases were selected because they show a variety
of contexts, initiators and participation dynamics.

Designing Urban
Transformation
Programs:

river

as a
tidal
park

Introduction

The programme the 'river as a tidal park' softens the quays and shores of the river Maas, which currently is primarily a highway for ships, and creates green and attractive shores. The process in which this programme was created went remarkably well and has characteristics of design thinking, transition management and entrepreneurship (effectuation). It may be an important process or even model to learn from for other policy themes and cities.

The following sheets describe the various phases of this process and identify leading principles and key roles which may also be relevant to other programmes and offers recommendations to do so.
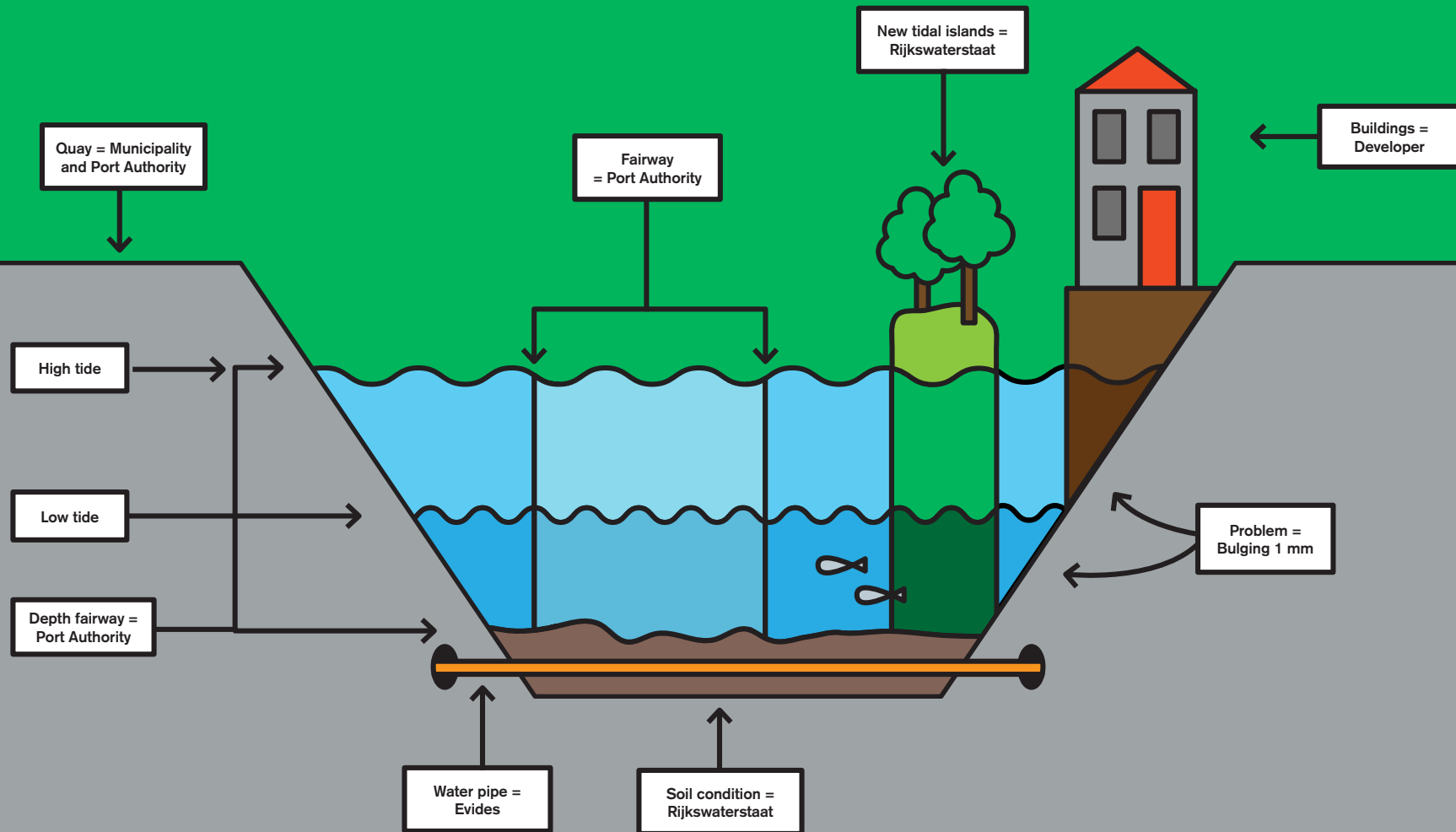
In and around the river flowing through the Rotterdam region, there is a dense concentration of interests and responsibilities. This results in the need to somehow translate social, economic and ecological aspects into feasible multi-stakeholder programs and projects. These circumstances are typical for many urban transformation challenges cities face.

The program 'the river as a tidal park' managed to create projects and synergies that individual public parties earlier failed to realize. After an inception period, in a relatively short time span of two years a program was created with 10 projects, engaging hundreds of people, a formal coalition of 17 organizations and a pieced together municipal bud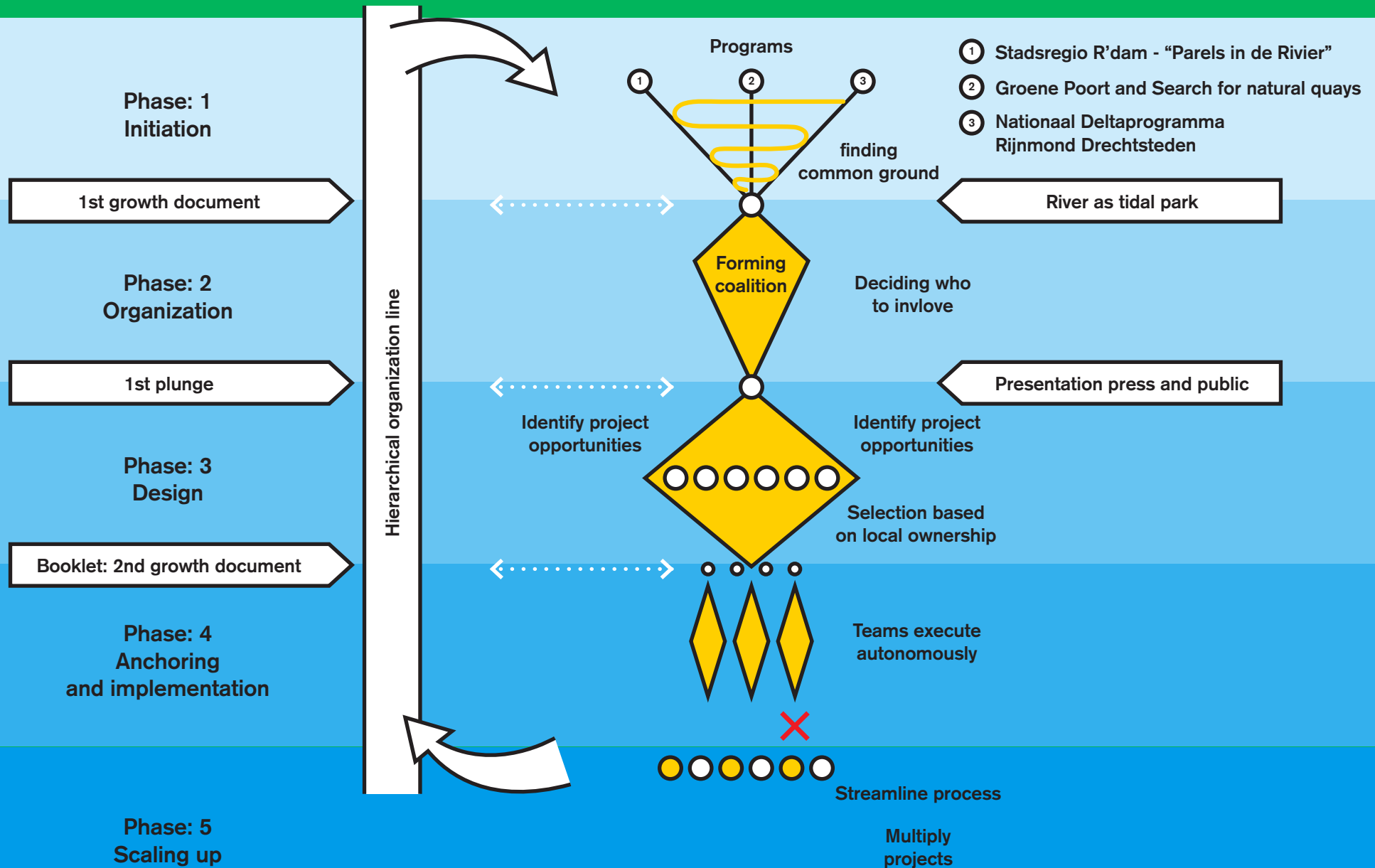get that was eventually multiplied tenfold by the Province, state and EU. Without an initial budget, detailed roadmap or formal high level political mandate.

The program has managed to find a way to continuously bring new projects forward. New potential projects are identified and then brought to the "right tables": from local stakeholder meetings to the city council and back into the municipal organization for realization.
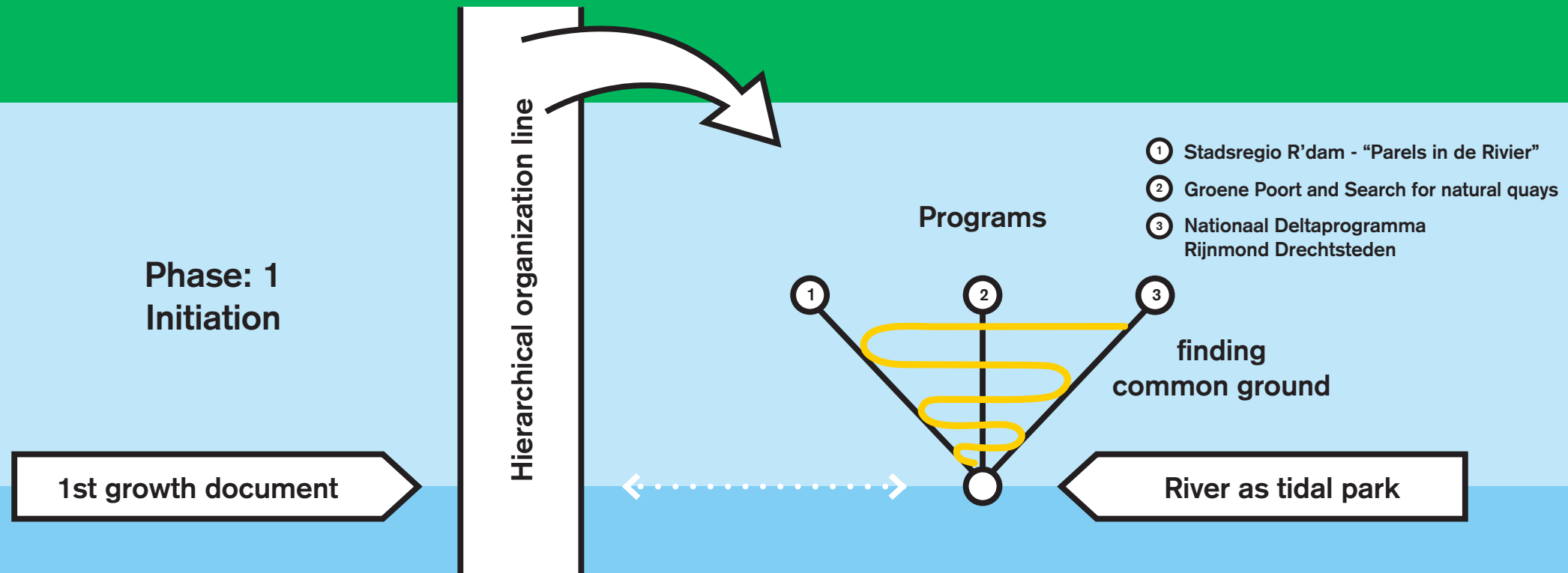
Stakeholder Map

Quay = Municipality and Port Authority

Fairway = Port Authority

New tidal islands = Rijkswaterstaat

Buildings = Developer

High tide

Low tide

Depth fairway = Port Authority

Problem = Bulging 1 mm

Water pipe = Evides

Soil condition = Rijkswaterstaat

Overview of the process

Phase: 1
Initiation

1st growth document

Phase: 2
Organization

1st plunge

Phase: 3
Design

Booklet: 2nd growth document

Phase: 4
Anchoring
and implementation

Phase: 5
Scaling up

Hierarchical organization line

Programs

1 2 3

finding
common ground

River as tidal park

Forming
coalition

Deciding who
to invlove

Presentation press and public

Identify project
opportunities

Identify project
opportunities

Selection based
on local ownership

Teams execute
autonomously

Streamline process

Multiply
projects

1 Stadsregio R'dam - "Parels in de Rivier"

2 Groene Poort and Search for natural quays

3 Nationaal Deltaprogramma
   Rijnmond Drechtsteden

Phase 1: Initiation

Phase: 1
Initiation

Hierarchical organization line

Programs

1st growth document

River as tidal park

1 Stadsregio R'dam - "Parels in de Rivier"
2 Groene Poort and Search for natural quays
3 Nationaal Deltaprogramma Rijnmond Drechtsteden

1

2

3

finding common ground

The river Maas is key to the identity of the city of Rotterdam and larger region. Many of its quays and banks are 'hard' but, especially land inwards, are of declining economic importance to dock ships. Various Public and private organizations are responsible for various parts of the river and each have their own priorities.

In 2012 Rijkswaterstaat (the national agency responsible for the major roads and waterways) seeks to enhance flood security, the region (including the City of Rotterdam) wants to enhance the spatial quality along the river banks and WNF (nature organization) wants to stimulate estuary ecosystems. Individually all three had difficulties in realizing projects. Partly forced by economic setbacks and the

resulting lacks of budgets, three policy makers from the respective organizations decide to start meeting up and to find ways to initiate a joint program. Based upon shared interests (for example both the Port Authority and WNF wanted to keep the river free from water locks) they find a frame in which the different interests are aligned. 'The river as a tidal park'. The city region steps in to explore this concept and hires landscape and urban designers De Urbanisten. They organize two co-design sessions in May 2014 with 100+ participants to imagine and visualize its potential for different locations. This first phase is used to search for active and motivated stakeholders, project owners that have the guts to better define the concept and translate it to specific locations.

"We had a shared mindset: goal oriented, practical, not too much talking but action. People who know their organization well: who know where to get the people and funds. Who can act at a strategic, tactical and operational level."

Image: De Urbanisten

Phase 1: Initiation

Principles:

Small initiating team: a small team from several organizations (Rotterdam, Rijkswaterstaat, WNF/ ArK Natuur), led by the Rotterdam city region, but with a shared ambition, mindset and drive to realize projects.

Operate outside the line: the program was developed as a network outside the hierarchies of the organizations. Initiators secured initial funding but superiors and politicians were involved at strategic points only and accommodated the program entrepreneurs to work outside the line organizations. This created space for new collaborations and projects.

Discovering overlapping stakes: individually, the program initiators were unable to realize changes. Instead of working from individual plans, they took time to discover each other's interests.

Let stakeholders jointly imagine the untapped potential: instead of creating a master plan first, early on collaborative design sessions were held to engage with stakeholders and identify promising ambitions and the added value of the tidal park.

Reframing the solution space: the untapped potential of the river landscape became clear by giving it a new identity as a tidal park, stakeholders saw new synergies and opportunities.

Role:

Program entrepreneur: expert policy makers that leverage resources to create a new program which they see as an opportunity to realize interests they value highly

Phase 2: Organization

1st growth document

Hierarchical organization line

Phase: 2 Organization

1st plunge

River as tidal park

Forming coalition

Deciding who to involve

Presentation press and public

The frame of the river as a tidal park appears to resonate and binds the different organizations. They become enthusiastic as it allows them to realize their own goals within a joint frame. Quickly a coalition of seven organizations is formed. These organizations signal that they are willing to co-fund specific projects.

In January 2015 the city of Rotterdam appoints a program manager and on March 15th the program is presented to the press and public during a symbolic 'first plunge' which was the kick-off for one of the projects (Mallegatpark). This same day ten organizations signed a letter of intent.

"Usually we make policy from opposing interests. In this case different interests came together in the same drive to realize the program. We may highlight different words, but they're in the same sentence."

Image: De Urbanisten

Phase 2: Organization

Principles:

Design an appealing framework: The river as a tidal park has instant appeal and positions the different interests as complementary rather than adversary. The framework and design principles were co-created with stakeholders and used to inspire local solutions. Attention was given to avoid the impression of it being an imposed vision, blueprint or straight jacket.

Formulate process milestones:
Milestones were formulated to present intermediate results to superiors and the broader public. These helped to create speed and sense of urgency within the program network and to secure commitment with the involved organizations. These formed a coalition of the willing.

Budget bricolage: Budgets were pieced together from different funds. As projects were already created jointly, they lend themselves very well to existing co-funding schemes. Other opportunities (i.e. using millions worth of silt from deepening fairways to build tidal banks) were also leveraged to create facts that bolstered commitment.

Role:

Independent program coordinator:
A program coordinator was appointed that worked on behalf of the entire coalition. This program coordinator was employed by the city of Rotterdam. Another civil servant acted on behalf of the city.

In-house lobbyist: program entrepreneurs were active to secure (co-) funding within the different organizations on a project basis.
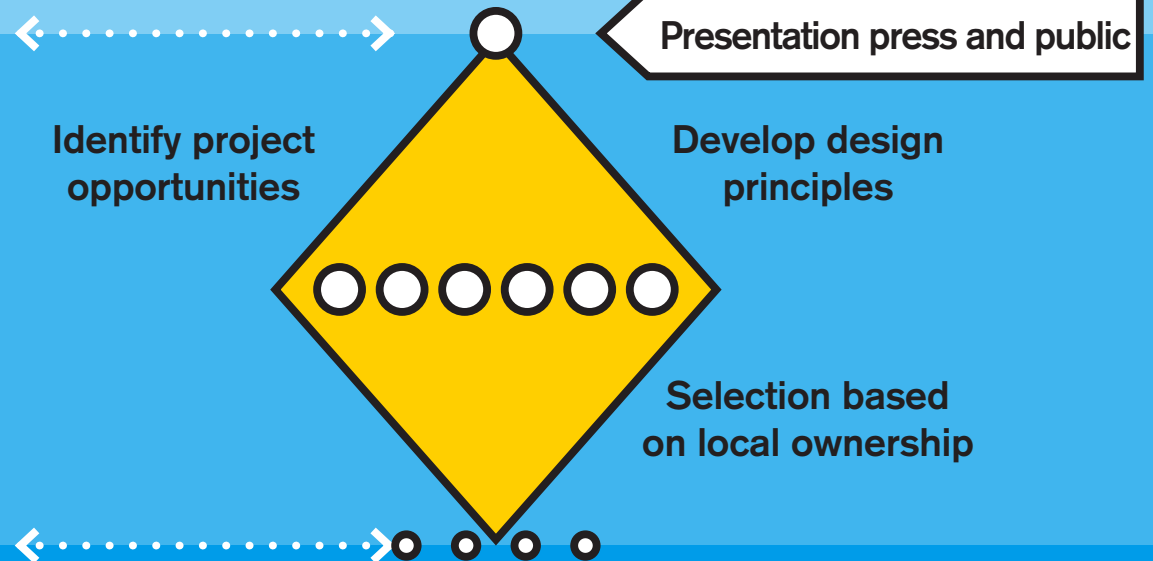
Phase 3: Design

1st plunge

Phase: 3 Design

Booklet: 2nd growth document

Hierarchical organization line

Identify project opportunities

Develop design principles

Presentation press and public

Selection based on local ownership

Right from the start, the emphasis was on designing local solutions that fit the overarching framework. The program team does not develop the projects on its own, nor does it step back and let others come up with ideas through tenders, subsidy programs or awards. Instead it facilitates collaborative design at different locations. As soon as local ownership is found, the owners become responsible for the process while remaining active to provide backing and funds. Sometimes ownership was found at municipalities, sometimes at nature organizations. But more importantly: where ownership is lacking like in De Esch (where local residents are sceptical) or Vlaardingen (no strong support from the municipality), projects are dropped. This process resulted in ten locations with a blend of new and pre-existing ideas.

As much attention was paid to visualisation (as opposed to lengthy reports) and collective design, the involved urban designers worked both on the projects and the overarching program. This created a strong relation between the two. It also resulted in further clarification of the tidal park concept through design principles. Examples were concrete principles on how to make the banks between land and river more gradual, how to find the right mix between nature and culture, how to create conditions for biodiversity and making use of water dynamics to create the new banks ('building with nature').

Conscious distance to the line organizations (i.e. the municipality) was maintained without steering committees etc. to promote flexibility. It was seldom necessary to escalate conflicts to higher officials as there were few.

"Don't start with the solution. First find the shared interests and then create location-specific designs. This resulted in joint, concrete, detailed and promising projects for which we had co-funding lined up. That success then turns into a flywheel."

Image: De Urbanisten

Principles:

Location-specific design: starting from the guiding framework and principles, workshops focused on location specific solutions. This resulted in quick identification of new and existing projects in line with the larger view of the river as a tidal park.

Selection based on local ownership: Only projects were carried forward in which a local problem owner came forward and where there was a lot of positive energy with local stakeholders. Little time and resources were lost at more resistant locations.

The power of visualisation: the program facilitates local design workshops and communicates in a very visual and attractive way. These visuals, together with the frame 'River as a tidal park', created a strong glue and common purpose that people could relate to.

Role:

Urban Designers as developing partner: urban and landscape design was part of the entire process rather than a separate activity. A framework contract allowed the involved designers to work on both specific locations and the larger river and to refine the design and steer discussions throughout the stakeholder co-creation meetings.

Local project owner: Each project had its own owner that set up workshops and a project team in line with the guiding principles but organizationally independent.

Program manager and team as facilitator: by not relying on a hierarchical organization from the start, the program team further emphasized intrinsic motivation, making it feel like a natural flow without much resistance.

Phase 4: Anchoring and implementation

Booklet: 2nd growth document

**Phase: 4
Anchoring and implementation**

Hierarchical organization line

Teams execute autonomously

Various projects still need to be implemented. Different projects like Nasssaukade and Mallegatpark started with this process in 2017. Both involved smaller docks in an urban environment and were financed by the City of Rotterdam, province, Rijkswaterstaat and the EU. These projects are relatively complex due to the integration of wet and dry development and combining ecological and aesthetic aspects. This poses a challenge to existing procurement processes and permitting.

In the case of Mallegatpark, the project team found creative ways to cut costs that were higher than expected. However a hydraulogic report needed for permits indicated that the tidal park would lead to new water flows that could further erode an existing hole above an underwater pipeline and rising water levels. As a result the permit is not granted. The contractor is responsible for the application of the permits. Various organizations and the contractor could have known about the hole. This led to large unforeseen costs, delays and the loss of an opportunity to reuse silt from a nearby river in the tidal park. As a result the project was halted.

The Nassauhaven project combines floating houses and a park and is set up by the municipal project management bureau. Halfway, the project team was made smaller to speed up the process.

The program managers stress that unforeseen technical issues are part and parcel of this kind of challenging projects. Thanks to the early involvement of the major stakeholders the various projects invoke little resistance from other stakeholders so far. The program demonstrated the value of the river as a tidal park, its power to identify and set up concrete projects and the potential of different organizations to collaborate. This makes a strong case for more explicit high level (political) support. Per January 2018 a new program manager is appointed and it seems that the program will be extended with more projects.

Image: De Urbanisten

Phase 4: Anchoring and implementation

Principles:

Re-embedding the projects: for implementation, the projects were re-embedded in the existing organizations and procedures to obtain permits, procure building processes etc. The complexity of the projects requires significant efforts and raises technical issues that the existing project management bureau needs to address.

Overcome internal resistance:
Once the project gets to the phase of implementation, the project go beyond the coalition of the willing. And there the project meets more internal resistance from civil servants who are not always aware of the added value of the tidal park.

Keep it small(er):
In other phases, co-creation with larger groups are key. During implementation this approach slows the process down and even reduces enthusiasm. Involve only the relevant stakeholders, create a smaller group. Make it clear - as early in this phase as possible - who will be responsible for long term maintenance and should be intensively involved.

Keep up the coalition vibe: In this phase government employees tend to become more formal as the project is moving towards more formal procedures and responsibilities. Avoiding risks can be the dominant topic, decreasing the positive vibe of the coalition.
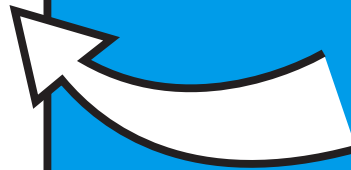
Role:

Execution-oriented project teams:
shifting larger exploratory workshops and meetings to smaller teams with more clearly defined roles and responsibilities.

The manager of expectations: The process might slow down or take longer than expected as it is an innovative project with technical challenges with many stakeholders involved who have never done a project like this before.

Phase 5: Scaling up

Hierarchical organization line

Phase: 5
Scaling up

Streamline process

Multiplay projects

From 2018-2020, the program approach continued with the aim of creating more projects and anchoring knowledge and procedures within the municipality. This was a continuous process of project implementation, local and international promotion and creating a growing number of enthusiasts. This led to ten new tidal park plans within Rotterdam and its surroundings.

Within Rotterdam, the tidal parks are more firmly anchored. Whereas the first projects were defined outside the line in coproduction with other stakeholders, new projects were explicitly put on the agenda of the city council. When they agree, a budget and project lead and team are appointed, and the project can move towards design and implementation on its own. The program provides the necessary knowledge and a network for co-funding and implementation. Outside Rotterdam especially professionals are approached and inspired. This has sparked new projects from Dordrecht (upstream) to the coast.

The program is now run by an independent, external expert. The municipality appears to be most often the leading stakeholder in this phase. RWS is often the runner up as they have an ambition to further develop under water nature and – together with the municipality – are responsible for maintenance. The nature organizations struggle with their position which is discussed in further detail below.

Principles:

Budget bricolage continued: The program is very successful in scaling up: it has brought many new and large projects on the agenda of the city council. They then agreed to a budget meant as co-financing. The municipality then appoints a project leader who is responsible for finding co-financiers. Many of those co-financiers came via the contacts of the program (RWS, Province). So the program has found a routine, or way of working to leverage their vision, expertise and network and to bring it back in the traditional execution line of the municipality.

Sharing knowledge: As more projects are being picked up, knowledge sharing about this dynamic nature process becomes more important. A first step is taken by the creation of a living lab[1].

Diversify or expand the portfolio to balance out stakes: Not all interests of all stakeholders can be covered in each single project. They should be made explicit in each project and balanced out over an entire program or portfolio of projects. This insight, combined with the wish to create more ecological impact, means that a larger program, covering a larger area is preferred. This area could reach from Hoek van Holland to Dordrecht. By using more functions

[1] Living lab "Building with Sediment", initiated by Peter van Velen, a cooperation between several knowledge institutions.

of the river, the goals of all coalition partners can be balanced out better and make a bigger impact on climate adaptation. Application to larger financial schemes, international funds.

Role:

The continuous booster: Expert in river tidal parks with a large internal (municipality) and external network who is able to find new projects, put them in the right spatial city plans and bring them under the attention of the City Council. After the OK of the Council, with a budget for co-financing and appointment of a project lead, the expert then makes sure the project lead has the resources to execute the project by sharing his knowledge and stakeholder network for co-financing and execution.

Experts as early adopters: This project has inspired many others: first, a broader range of experts heard about it, got inspired and started to act within their own area by bringing it to the right tables, such as spatial plans of the surrounding municipalities.

Reflection

Keeping ecology at the forefront:

The involvement of nature organizations increases the likability of the program. However, the role of the nature organizations is at stake. They contribute in time, not in cash so they have no formal power. They bring in lots of ideas but many of them cannot be executed or need to be changed. They question themselves: what should our future role be? If we bring in hours, expertise and "likeability", we want the parks to soundly strengthen the river's ecology. No formal power is not an option. But stepping out is not a preferable situation either: not being involved means not being able to influence the process and quality of urban tidal nature at all.

The parks are also shifting in the direction of more recreation, potentially reducing the interests and goals of nature organizations even further.

Scaling within or outside the municipal organization:
With the coalition of the willing it was possible to bring speed in the process. This was essential and the showcases can now be used to scale up. But is this principle still the best for scaling? Is bottom-up too slow and should we be more aware of the general necessity of river parks? In that case, a more directive approach, with smaller teams, clearer budgets, clear roles of stakeholders in maintenance seems to be the way to go. Or maybe the best way is something in the middle: we'll keep the informal, positive vibe and

principles of the coalition of the willing. The program consists of a clearer overall vision on the river and acknowledges the goals that are binding all coalition partners but also pays attention to local focus goals: in some areas, natural values might be dominant; in others the city and its inhabitants are dominant. This means that each project might have another approach and other financers. As long as all goals of the coalition partners are met and balanced out on the overall project.

Communication and promotion:
Promotion is key in scaling up. It can also help to reduce internal organizational skepticism and resistance by showing the city how beautiful these projects are, that in turn attract more visitors. If the reputation of the tidal parks is positive and more visitors will come, resistance within the organizations will be reduced and other potential projects find a better breeding ground.

At the moment, there's a strong trend towards greener cities, much more than 5 years ago. So now it's the time to show these tidal parks to the city and promote some of the less known benefits such as underwater nature and creating biodiversity with tides. Now that more projects come to realization, the program has even international potential for promoting the Rotterdam area.

Paradigm shift in urban nature design:
A paradigm shift is going on in urban nature design, which is manifesting itself

in River as a Tidal Park. In this program the interests of nature, people and the city are united but can also collide: for nature to flourish, long term processes, the way of planting and a certain scale are required. For a city, nature must look nice from the start, people must have access to it and the available space might be small. But still it is essential that nature flourishes and thus it requires knowledge and influence from nature organizations. These different influences lead to a new style of urban nature design: more natural, wilder and more varied.

"In the beginning you need naïve enthusiasm. Otherwise you won't get anything off the ground."

Designing Urban
Transformation
Programs:

city

ZoHo
climate
proof

Introduction

The Zomerhof, or ZoHo district is a small district just north of the city center that houses over 4000 inhabitants, some large schools and a hotpot of creative entrepreneurs. The abandoned elevated railway line 'de Hofpleinlijn' which cuts through the district is its landmark. The arched, brick spaces underneath the line, the 'hofbogen', are home to a range of craft, cultural and food shops. ZoHo is one of those upcoming areas that can feel quite indefinable at some times but then you make a turn and suddenly face an old train carriage that serves vegan food, enter a buzzy nightlife hotspot or face the iconic Raingarden.

The neighbourhood is more than a meter below sea level, there is substantial land subsidence especially in private gardens and its inhabitants frequently complain that streets and gardens become flooded after heavy rains. Around 30% of the area is public and 70% private held. As the district is in continuous redevelopment, buildings switch functions, streets and squares are redesigned and underground water infrastructure is updated. The physical dynamics are matched by the social.

There are many citizen and creative led initiatives, strong social networks and a history of cooperation between residents, municipality and the water board. From 2015 onwards urban planners (ie Urbanisten) made designs for the neighbourhood so 'not a drop of water would leave the district'. This makes ZoHo a favourable context to co-design innovative adaptation actions.

The dynamism in the district also led to some unforeseen developments. Buildings like the Hofbogen (where the municipality had user rights for the roof) and Katshoek were sold. The procurement led to delays that conflicted with the LIFE planning and the new owners did not express interest in the foreseen green roof. As a result new actions were initiated. The greening went from roof to street level and in three Urban Adapt actions green was added to the public space (raingarden, rainaway garden and Heliport) with a leading role for designers and residents.

The fourth action concerns the separation of sewage and rainwater catchment systems underneath the Vijverhofstraat and other streets. To create a blueprint of the urban adapt process, this report zooms in on the Vijverhofstraat sewage and rainwater catchment and the Heliport process. These help understand the differences and similarities between a municipality and resident-initiated process, respectively.
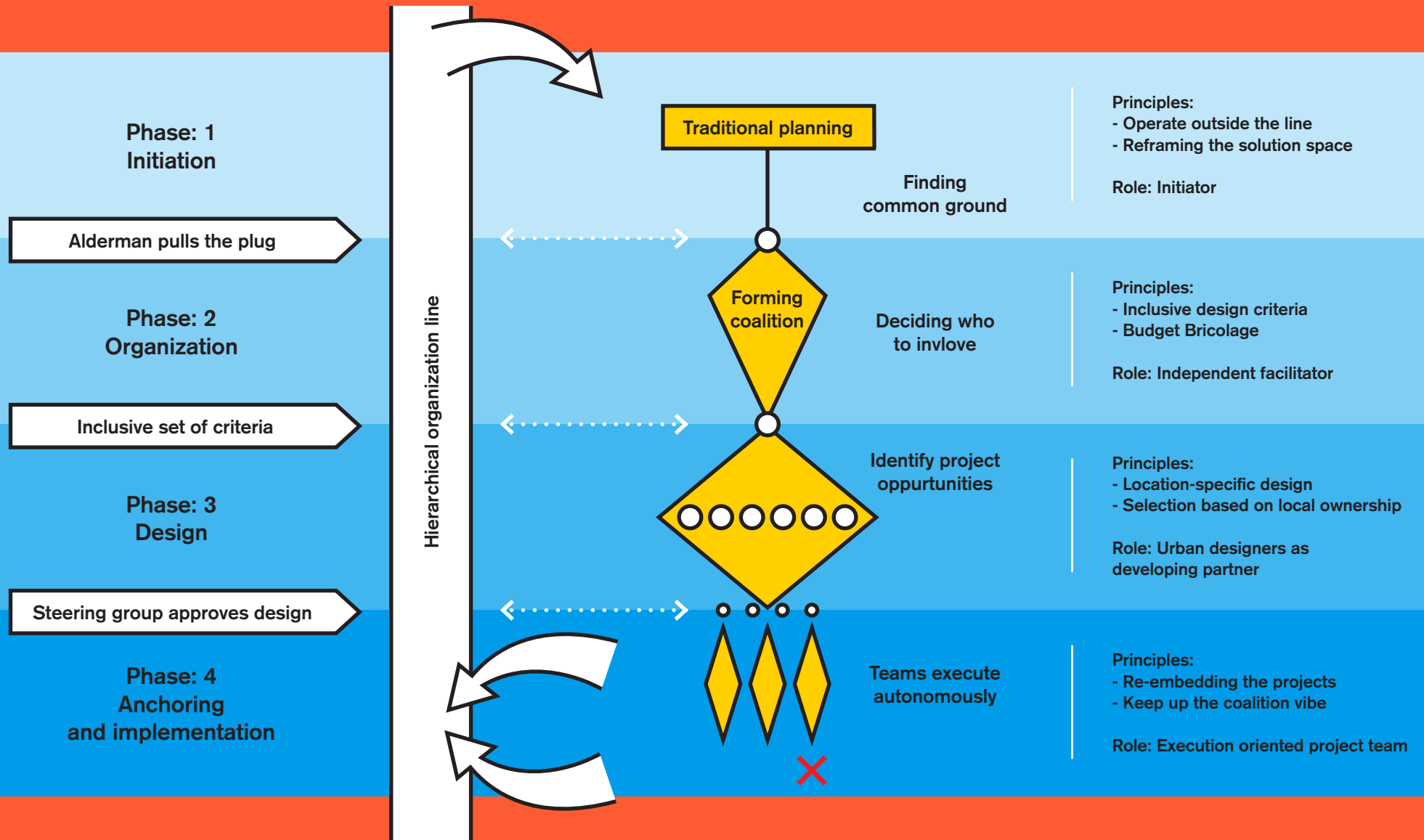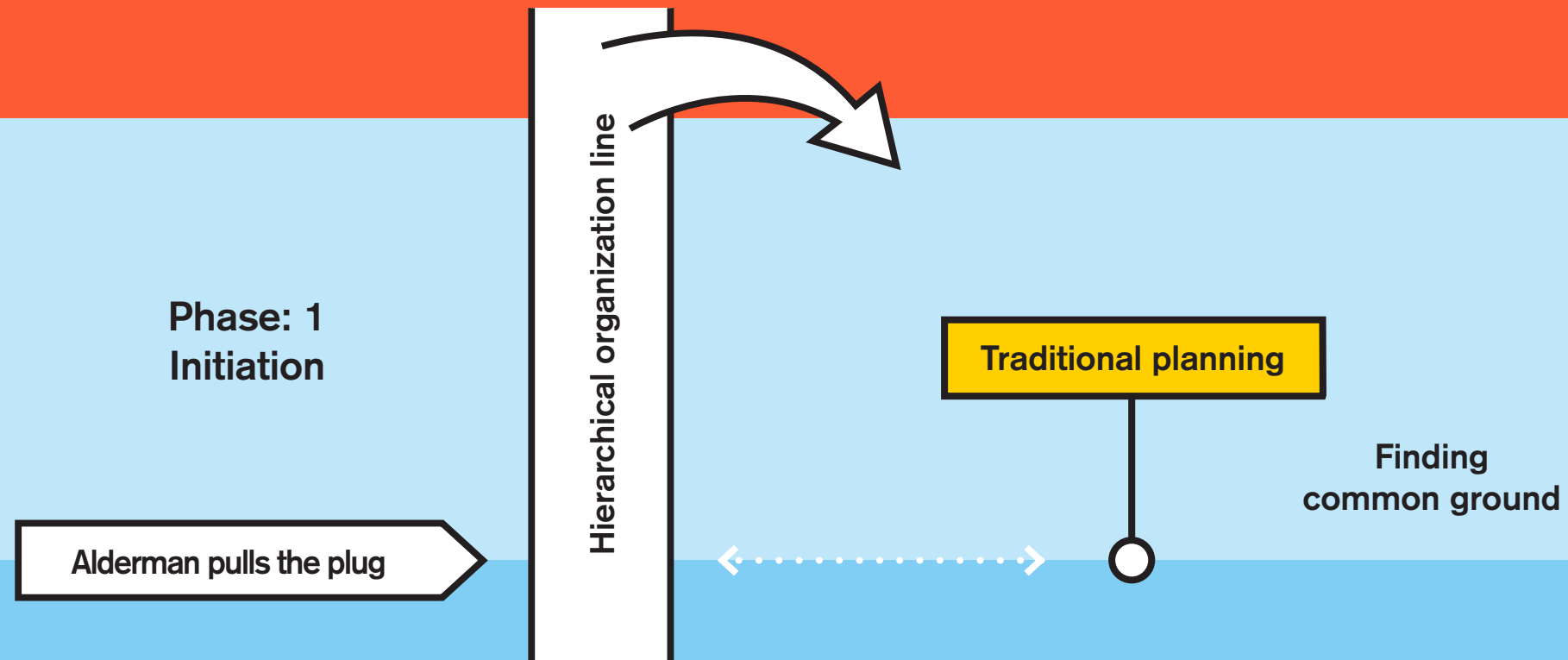
Stakeholder Map

Owners
(inhabitants, housing
corporations or businesses)

Municipality

Drain

Garden

Retention

Cellar

Groundwater

Hoogheemraadschap

Cables

Sewer

Drain

Foundation

Vijverhof straat

What lies below
the Vijverhofstraat:
drainage, sewage and
conflicting interests

Overview of the process

Phase: 1
Initiation

Alderman pulls the plug

Phase: 2
Organization

Inclusive set of criteria

Phase: 3
Design

Steering group approves design

Phase: 4
Anchoring
and implementation

Hierarchical organization line

Traditional planning

Finding
common ground

Forming coalition

Deciding who
to invlove

Identify project
oppurtunities

Teams execute
autonomously

Principles:
- Operate outside the line
- Reframing the solution space

Role: Initiator

Principles:
- Inclusive design criteria
- Budget Bricolage

Role: Independent facilitator

Principles:
- Location-specific design
- Selection based on local ownership

**Role: Urban designers as
developing partner**

Principles:
- Re-embedding the projects
- Keep up the coalition vibe

Role: Execution oriented project team

Phase 1: Initiation

Phase: 1
Initiation

Hierarchical organization line

Alderman pulls the plug

Traditional planning

Finding common ground

In December 2016, the municipality presented a plan to renew the sewage system for the larger Agniese Neighbourhood, in which the ZoHo district and the Vijverhofstraat are situated. The leaking sewage system took in ground water. This led to a dropped ground water level and insufficient capacity to process heavy rains. It was to be renewed with a separate piping system for rainfall, including a buffer.

The plan was locally communicated as an innovative experiment in climate adaptation and urban planning. It expressed the city and EU policy ambition that 'not a drop of water' would leave the district. Locals raised fundamental questions. If 'not a drop

leaves, where does the water go to?' and: 'what is the impact on this or that particular house or garden'? These questions could not be answered satisfactorily as community involvement officials without the necessary technical knowhow were in the lead.

This plan thus encountered local protest, organized in the group 'dry feet'. The renewed sewage system would cause ground water levels to rise again, with the risk of flooding basements and gardens. In its presentations the municipality stressed that preventing water damage indoors or gardens is legally a responsibility for the property owners. Still, some homeowners with basements or low lying gardens were now suddenly confronted with expensive

measures as a consequence of the municipality's plans. As the external process facilitator voices their anger: "I don't care what is possible or not possible: you are talking about my savings and pensions!". Because of the local resistance, the alderman decided in December '18 to stop the process and create a new plan together with all stakeholders.

The 2016 plan is an example of traditional urban planning in which the municipality weighs the interests, sets the criteria and makes the design and only then engages with citizens during public meetings. Its failure illustrates the benefits of the more collaborative design approach sought for in the urban adapt programme.

Phase 2: Organization

Alderman pulls the plug

Phase: 2 Organization

Inclusive set of criteria

Hierarchical organization line

Forming coalition

Deciding who to involve

In 2018, a process facilitator (+anderen) who had written a blog about the 'bliss of resistance' was called with the message: 'well, in that case, I have an interesting project for you'. As a first step the facilitator approached a wide range of inhabitants and stakeholders to identify their wishes and demands. A well-structured and transparent process was set up, building on the existing 'Neighbourhood Community Agniesebuurt'.

This community included inhabitants and key stakeholders like the housing corporation, the water board and the municipality. The community kept everybody up to date about the plans, results and themes through meetings, a public website and social media.

An advisory expert table was set up to define a more inclusive set of design criteria, develop scenarios and a preferred option. Because of the earlier conflict, residents considered it important the table would operate independently. Therefore the technical experts (instead of decision makers) joined the residents at the table. The expert table itself was chaired by independent actors +anderen and a water professional from Wareco. The expert table reported to a steering group with decision makers who were to oversee the process and decide on the advice of the expert table. The municipality was ultimately responsible for the decision and implementation.

To contain the effort, the redesign process only focused on the key controversy: the effect of new sewage and drainage on the ground water level. To prevent delays, redesign of the street layout took place in parallel.

"Emotions cannot be countered by only providing more information."

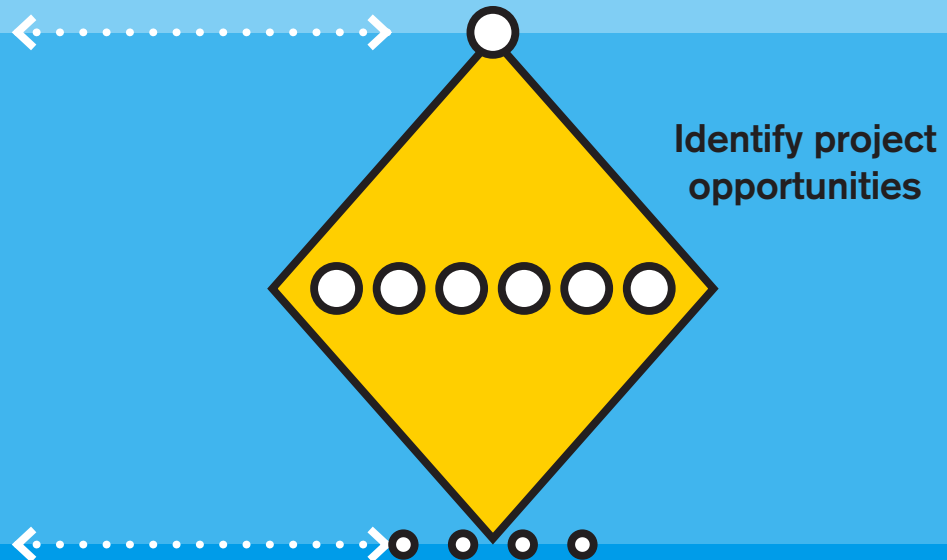# Phase 3: Design

Inclusive set of criteria

Hierarchical organization line

Phase: 3
Design

Steering group approves design

Identify project opportunities

During more than a year, eleven meetings were organized by the expert table. A list of some 30 wishes and criteria from all stakeholders was drawn up. Next, three extreme scenarios were developed and ranked against these criteria. Each of these extreme scenarios had a meagre score, but it allowed the stakeholders to discuss trade-offs. Based on this, a preferred option was developed and presented to the steering committee that agreed.

Stakeholders experienced the process as long and quite demanding. One reason being that the trust "started at minus 5". Rebuilding trust required full disclosure and giving residents an equal voice at the table to weigh different options. However to do so, residents had to get more or less on the same page as the engineers with regard to the technicalities of underground water management. Although the most actively involved residents were well-educated and interested, this took a lot of time and effort from all sides. On top of already detailed information (more than usually collected), additional information was collected on the state of private houses and gardens. Water professionals gave presentations and explained how they worked.

In the final design, responsibility for climate adaptation measures fully remained with the municipality. Water retention under both public and private areas was discussed, but this would mean that measures to prevent

pluvial floods would become a shared responsibility. Neither the municipality, that would become dependent on the implementation and maintenance of water retention in gardens, nor the inhabitants that would become at least partly responsible for them, wanted this. The expert table was concerned that situations would arise where some people could not afford or did not want to take the measures. This could result in tensions between neighbours.
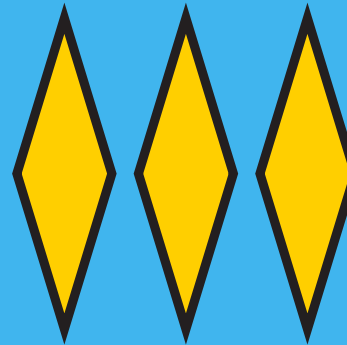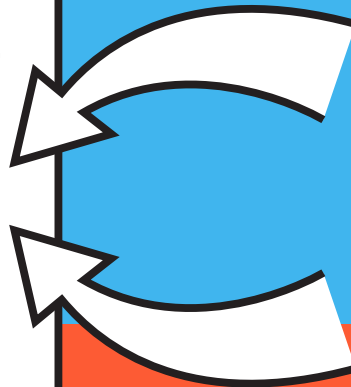
Phase 4:
Anchoring and implementation

Steering group approves design

Hierarchical organization line

Phase: 4
Anchoring and
implementation

Teams execute
autonomously

In the final design agreed on by the steering group, the groundwater level will more or less stay the same. Additional drainage was provided underneath the street. A few drainpipes were connected to this. For the majority of drains, it proved too costly to separate sewage and drainage streams in existing buildings. No changes were made on private properties with regard to the height of gardens, waterproofing lower floors, drainage in the gardens or disconnecting garden-facing drainpipes. The latter remained connected to the sewage system. Additional measures to prevent nuisance in gardens after heavy rainfall were not detailed but it was offered to implement them on a case by case basis, coordinated by the housing corporation. To control risks that groundwater levels would still rise and flood cellars, an active pump will maintain the drainage water level for the next ten years.
If monitoring by then shows no negative effects of the water catchment system, the pumps will be removed.

Based on the criteria and design principles developed by the expert table, the municipality further detailed the solution. Some local fears remained that slower infiltration underneath the streets would lead to more water nuisance. The engineers disagreed as ground water levels under gardens were generally somewhat higher than under the streets. In the end, a more innovative albeit expensive option was chosen for the drainage of the street (aquaflow).

In this system rainwater is stored, cleaned and slowly released in the bedding of the road, while waterproof foils prevent horizontal water flows from the street to the buildings and gardens. The careful process did not fully prevent local objections. After final plans were approved, there still was local protest about the removal of a line of trees near the houses. Which goes to show that a careful process does not mean that every single inhabitant will agree or participate.

All in all locals are satisfied with the new process and outcome. The most critical and vocal locals have come to support the new design. They feel their questions and interests have been taken seriously. Residents no longer experience negative effects from the adaptation measures.

Reflection

The design process for the Vijverhofstraat both exemplifies the importance of co-producing climate adaptation designs and its difficulties. With regard to the first, the design process overcame the local resistance against the initial plan the municipality had drawn up without co-production. In that sense it was a success. The new design process was deemed fairer and the resulting plan could count on more local support.

However, participants from all stakeholders considered the process quite hefty. It took a lot of time, money, effort, additional data collection, etc. Participants from the municipality were not sure if they would do it again. An important reason for the heavy process was the initial conflict itself: trust had to be re-established. This demanded a process with high (perceived) legitimacy: well-structured, neutral, with all facts on the table and with creating sufficient technical expertise on the resident's side so that they did not feel pushed in a certain direction or overruled by the experts. In this sense, the intense process of collecting additional data and building technical knowhow was not solely about content, but at least as much about the perceived fairness of the

process. If the process had started in a more collaborative way from the start, it might have been more smooth according to some of the interviewees. Although it remains uncertain whether residents would have been motivated to put as much effort in it as they did now. After all, conflict is in itself a form of citizen engagement.

At its core, the process was not about designing an inspiring, innovative way to deal with climate change, but to pacify opposition by preventing adverse effects. The initial presentations of the municipality which stressed a 'new way of dealing with adaptation' and featured images of how people could make their gardens rainproof may have put residents on the defense. In situations where a city initiative to renew sewage/drainage has a negative impact on (some) houses and gardens next to the positive impacts, or even in other policy domains with a similar situation, the type of process followed in the Vijverhofstraat, may well be a good example. It reflects the 'costs of doing good policy' in such contested processes. Local governments need to build the necessary capabilities for this and, in case of conflict, make use of independent advisors and process managers.

Climate adaptation is a complex problem for which responsibilities are shared. In the Vijverhofstraat the responsibility for designing measures was indeed shared. However the final plan actually meant that the municipality

took over the (legally clear) responsibility that residents have for waterproofing their house and gardens. Residents in the end did not do more to respond to climate change, but actually had to do less. It became clear that also the municipality preferred such a division of responsibilities not only for political reasons, but also to avert the messy situation that would result from a shared responsibility. A situation that would open up a range of potential future conflicts between the municipality and residents and between residents themselves.

This is a caution to policy makers that hope that if they take measures in the public space, residents will respond by taking additional measures themselves.

The public-private border is a hard barrier to cross for public policy, even if climate change does not have that same issue.

A final note is about inclusiveness. A group of residents that may have pleaded for a higher ground water level did not come forward, although efforts were made by the municipality. Whereas some residents have a 'cellar issue', others have a 'foundation issue' caused by the low ground water levels which exposes foundations of wooden poles to oxygen, leading to rot and the need for expensive repairs. Given the high costs of foundation repairs, residents tend to ignore such issues for as long as possible. Not being at the table, this issue did not come to the foreground.

It may have been that there was no real issue here, but it may also well be that residents that feel that direct harm is done to them are simply more motivated to come forward than residents who may have been prevented from harm later on. This makes it difficult to judge the inclusiveness of the participation and is an important note for those organizing processes like these.
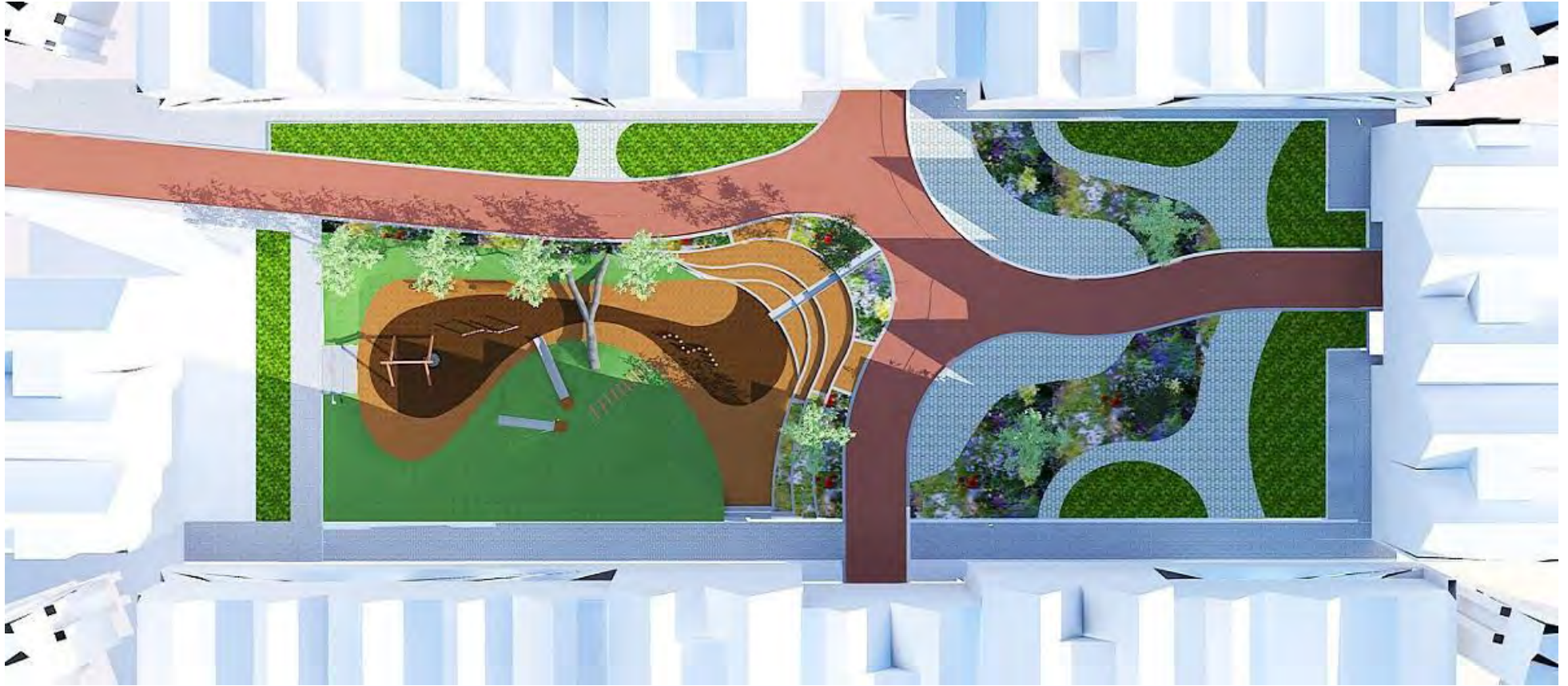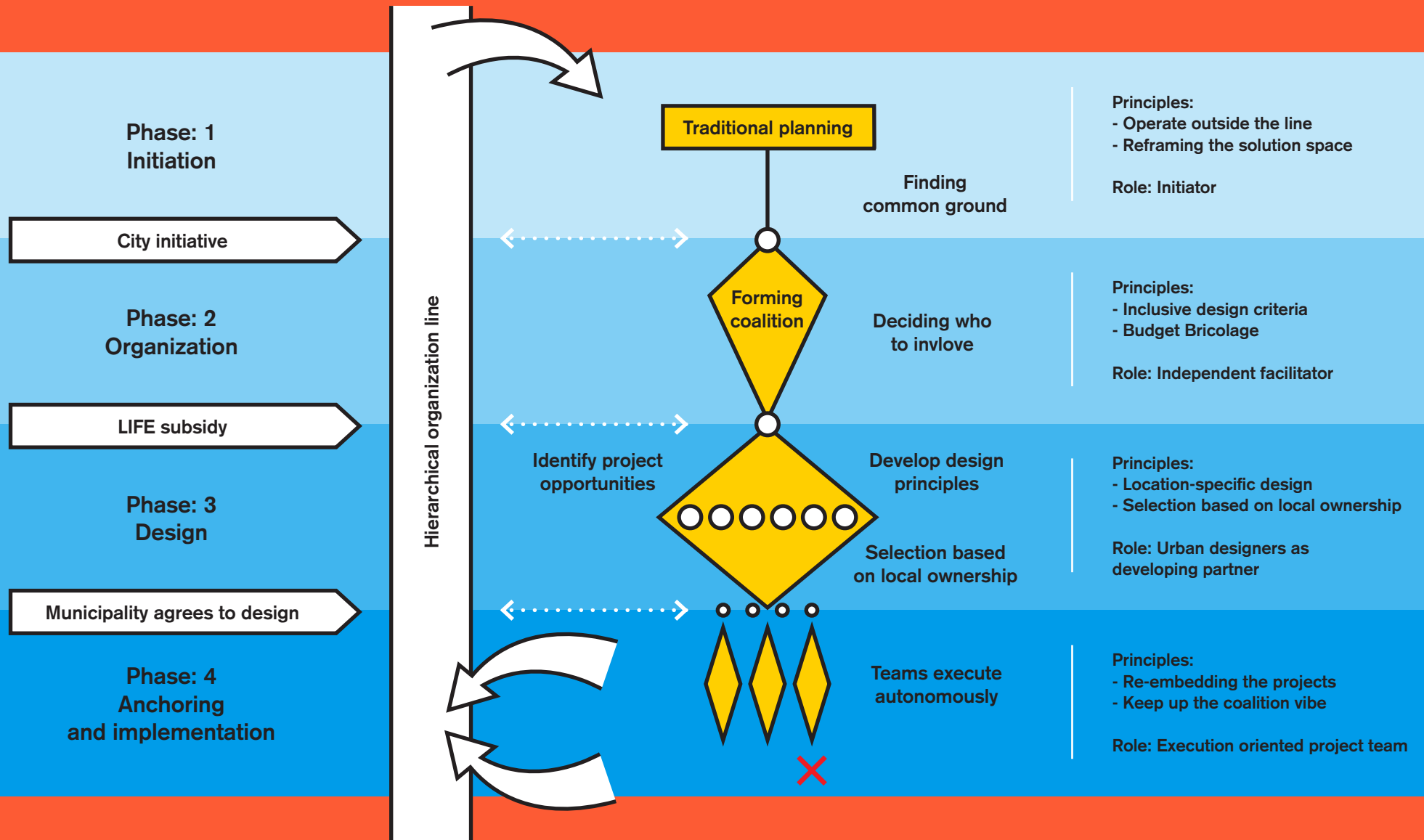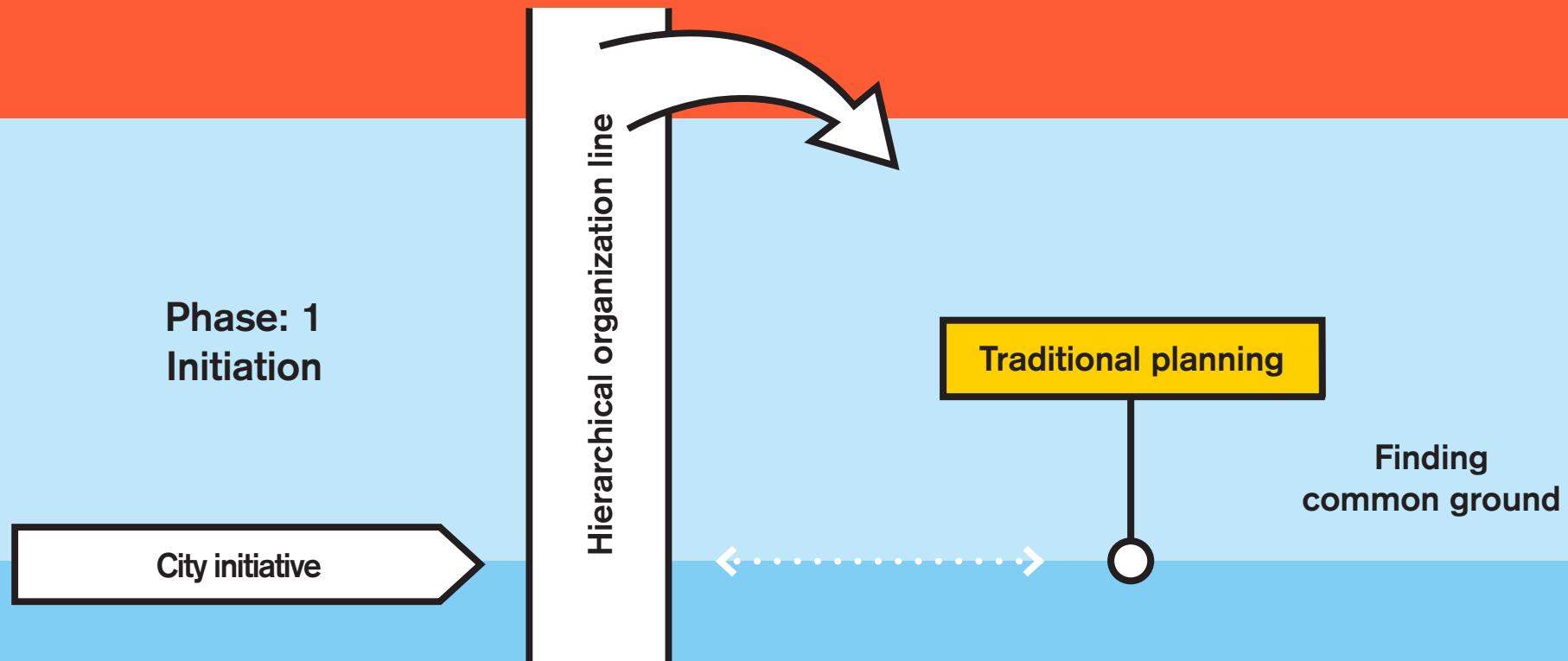
Heliport

Image: Gemeente Rotterdam

Heliport

Overview of the process

Phase: 1
Initiation

City initiative

Phase: 2
Organization

LIFE subsidy

Phase: 3
Design

Municipality agrees to design

Phase: 4
Anchoring
and implementation

Hierarchical organization line

Traditional planning

Finding
common ground

**Forming
coalition**

Deciding who
to invlove

Identify project
opportunities

Develop design
principles

Selection based
on local ownership

Teams execute
autonomously

Principles:
- Operate outside the line
- Reframing the solution space

Role: Initiator

Principles:
- Inclusive design criteria
- Budget Bricolage

Role: Independent facilitator

Principles:
- Location-specific design
- Selection based on local ownership

Role: Urban designers as
developing partner

Principles:
- Re-embedding the projects
- Keep up the coalition vibe

Role: Execution oriented project team

Phase 1: Initiation

Phase: 1
Initiation

Hierarchical organization line

Traditional planning

Finding
common ground

City initiative

Next to ZoHo lies a complex with some 600 houses from the early 80s. Previously it was a helicopter landing area: hence the name Heliport. However in Rotterdam the complex is commonly known as 'gnome village' due to its smaller, stacked apartments with pointed roofs. It has a parklike exterior, but according to the initiator: "the large inner courtyard was an echoing place with stones, old shrubbery and a dated playground". As a New Year's resolution she decided to try and do something about it.

The initiator teamed up with other residents and sent a proposal for a local initiative to the neighbourhood council. This proposal built on previous experiences and networks of other informal local initiatives like the group 'green fingers' that kept the complex clean and took care of the plants and the Hofbogen-park initiative. The proposal did not lay out what and how the final design should be, but rather listed the ambitions for the courtyard, like urban green, bottom up initiatives, disconnecting drain pipes and sustainability. It ticked all the boxes of the council and 5000 euro was granted to design the courtyard early 2018.

Phase 2: Organization

City initiative

**Phase: 2
Organization**

LIFE subsidy

Hierarchical organization line

Forming coalition

In an earlier attempt to green the complex, residents drew up 'out-of-the-box' inspirational pictures that led to angry 'what-the-hell' responses by some of their neighbours. Learning from this, an independent designer/foundation specialized in the collective design of shared gardens was contracted by the municipality (Stichting Tussentuin). This foundation acted as an intermediary between the ideas, demands and wishes from all the residents, soon joined by civil servants and the water board. The owner's association that has no formal role with regard to the courtyard (which is public space) was not actively approached.

The local initiative initially covered greening only one corner of the square and the design of an opposite corner. However other plans fit so well, that the budget and scope was extended. The initiator learned that the playground in the square was up for renewal and earmarked by the municipality for a more natural playground. In turn, the civil servant responsible learned about the local initiative through the water board. Furthermore an inventory showed that the street and sewers would also be up for renewal in the short term.

So this could be added to the proposal. The municipality therefore contracted the designer also for a design of the full square. A key event was that, while the first corner was being done,

the residents came in contact with the urban adapt programme that was looking for new actions. The original ambitions of the residents and the urban adapt programme to make the square climate proof matched well. According to one of the initiators "it all fell together like a jigsaw puzzle".

"It started out as a New Year's resolution. Two years later we received EU subsidy and one year later, it is there. Quite remarkable. And it is still our project!"
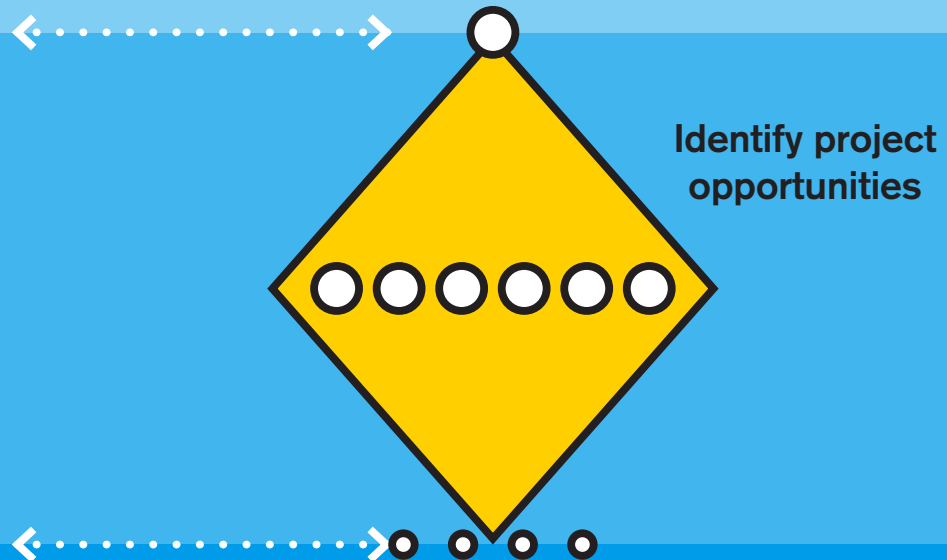- local initiator

Phase 3: Design

LIFE subsidy

Phase: 3 Design

Hierarchical organization line

Municipality agrees to design

Identify project opportunities

Stichting Tussentuin led the design process. The municipality, with representation from the engineer's office, the community manager and maintenance was one of the partners. The water board was frequently consulted. The initiators organized the participation of residents. A wide range of activities was carried out: a facebook group, meetings, design by children, email, initiators went from door to door, etc. A lot of residents became involved some way or another through this. And also important: residents who opposed to certain elements, could not say that they had had no opportunity to voice their concerns. The designer and initiators made sure that minority positions were included as much as possible included in the design as well.

Process wise, the design started by discussing different reference pictures with more or less trees, terraces, playground, etc. By voting for the most desirable references, a general mood board was set up. The next meeting the mood board was discussed. Afterwards three concept designs were made. Residents were encouraged to vote online for these scenarios through flyers, social media etc. Although the shapes for the garden (round, or with squares) was up for debate, there was broad support for several key aspects like making the square as traffic-free and green as possible. Other elements were changed. For example a pond was removed from the design because of fear for attracting mosquitos. An inventory was made of necessities like pick&drop,

wheelchair accessibility and access for maintenance. The design was finalized in spring/summer 2019. Although the municipality preferred a design with squares, it ultimately accepted all the design choices of the residents and decided to implement the design.
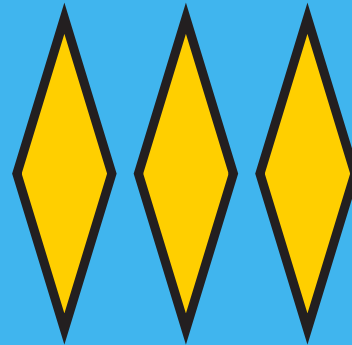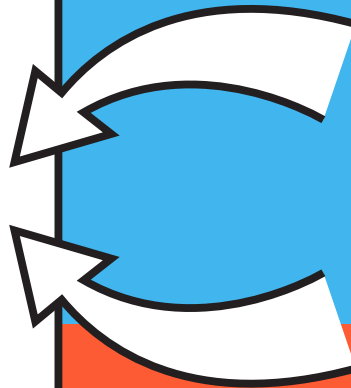
Phase 4: Anchoring and implementation

Municipality agrees to design

Hierarchical organization line

Phase: 4
Anchoring and implementation

Teams execute autonomously

Implementation started summer '20. During the previous years, the residents had not anticipated that it would take such a long and intensive process to put the first shovel in the ground. However, in retrospect they are very happy with both the process and results. From the municipality's side, civil servants were surprised about the level of detail needed and the emotional responses, positive and negative, of the residents. It "is a new way of working that takes a lot of time but is fun to do".

This is not to say that the final steps to implementation were without issues. The owner's association protested about the disconnection of the drainage pipes in the square, although resident support for the new square remains large. Other issues arose from the transfer from the general spatial design, led by residents and Stichting Tussentuin, to the detailed technical design, led by the municipality. An example of this is maintaining the safety for pedestrians of the drainage channel on the surface, but at the same time maintaining sufficient drainage capacity. But the end result matters.

The new square is much more in line with the desires of both residents and the various parties involved from the municipality. Integrating the challenges and working together on the design produced better outcomes.

Reflection

The Heliport case is considered successful by the involved stakeholders. It shows that citizen-initiatives can be successful and realize a wide range of policy goals. An important accomplishment is the integrated nature of the final design. Without this LIFE-supported citizen initiative it seems likely that individual actions like updating the playground, renewing the sewage and drainage system, greening the area and street maintenance would have been carried out separately resulting in higher costs and lower quality.

Based on the interviews, one reason for success was the larger existing 'ecosystem' for citizen initiatives. Networks of social initiatives of citizens but also the water board and municipality, provided information on opportunities like a green playground and key lessons on how to organize the process. These lessons include starting from ambitions instead of a concrete design and hiring an independent designer to incorporate the different wishes and desires. The availability of funds like Urban Adapt looking for new actions and the fund for citizen initiatives was highly instrumental in letting 'the pieces fall into place' and helped broaden the scope. A second reason is that residents felt ownership over this public space which is effectively a public inner courtyard.

Residents not only initiated the action, but also took on responsibility for engaging their neighbours in a large number of ways. Resistance or disagreement over what the square should look like did occur, but in the end the board was broadly supported although some resistance for decoupling the drainage pipes from the owner's association remained.

Discussion: urban adapt

The urban adapt objective for ZoHo is the following. "In the district ZoHo the City of Rotterdam will engage with a large number of non-organised private and public stakeholders to implement a district wide climate adaptation strategy that aims to increase the green infrastructure, create water storage capacity and improve infiltration capacity. This will reduce the average temperature and lower the risk of sewer flooding." A key difference with the river as a tidal park is that the key stakeholders here are residents that have less knowledge of adaptation challenges and solutions and are immediately confronted in their daily lives with the positive and negative effects of measures.

Not all of the original ambitions for the area have been met. The most ambitious spatial advice for 100% local rainwater catchment ('not a drop of water leaving the neighbourhood') was certainly not met. Nor was it considered realistic or desirable by specialists from city maintenance, in charge of implementing the actions. Especially measures on the 70% of private area were hard to realize and they fall outside the formal responsibility of the municipality. Some of the larger actions originally proposed, like greening the roof of the Katsgebouw, were replaced by smaller scale actions in public area like the Heliport. However, the ZoHo district can still be considered a show case for climate adaptive

measures through the combination of greening public space, creating two areas with parklike qualities (Raingarden, Heliport), the separation of sewage and drainage systems and smart barrels and other water innovative retention mechanisms.

Another objective for the area was creating a blueprint to 'develop a climate change strategy and participatory decision-making processes necessary for implementing urban climate adaptation strategies'. The two examples show many similarities and both fit the blueprint in page 13. The initiation, organization, design and implementation phases are all present, even as in Heliport the organization and design went back and forth as the project expanded. The role of an independent chair of the process was key to ensure that other stakeholders than the initiator were heard and could provide their input on equal footing. The design process went from defining ambitions and criteria to developing scenarios and, based on that, a final design.

The ultimate decision, technical design and implementation were the responsibility of the city of Rotterdam. The main differences are the initiator (residents or municipality) and whether resistance led to the design process or took place within the design process. This led to different ways in which phases, principles and roles were carried out. In addition to the general principles and roles, presented in the overview, the following are added for projects involving residents.

Principle:

Don't overestimate the potential to get behind the front door.

Rotterdam implemented measures in public areas for which they are responsible, but by including residents also aimed to inform them on climate change issues and motivate them to take corresponding measures themselves in their homes and gardens. Although inhabitants indicated they gained more knowledge about the effects of climate change and supported the goal to address these, they did not take steps in their own domain. This can be seen in the Vijverhofstraat, but also with some of the other actions where greening (private) roofs changed to greening public space and the resistance to decouple drainage pipes in Heliport. Although this may change in the years to come, responsibility for adaptation stayed firmly with the local government.

Role:

Let the initiator take the lead in citizen engagement (but not the design).
The logic is that if the initiator (resident, local government or other) leads the actual design, other stakeholders may respond defensively, but without giving the initiator the lead in engagement, the initiative gets lost.

Assume broad responsibility for informing residents. Residents have a knowledge disadvantage and if they fear this is used against them, they will resist. The local government as a steward of the public interest and more knowledgeable partner should assume responsibility here. This can involve data collection beyond the public domain when resident property is affected (as part of a smart city strategy), joined fact finding and long-term monitoring. It can be difficult to organize this when the local government has a project-based organization as these tasks can predate (data collection) or continue after the project is implemented.

Recommendations

"It is more about effectively realizing challenging and important projects than about efficiently optimized workflows."

Key points:

Sites: The cases share a blueprint, but their differences matter and lead to different process choices, effects and implications. More mainstream projects where local acceptance is necessary lead to a mixture between the urban adapt approach and traditional planning. When opposition occurs, a focus on 'innovativeness' will backfire when perceived to downplay genuine, real life concerns. A programmatic approach helps to scale up.

Responsibilities: Urban adapt shows that responsibility for designing the public space can be shared with other stakeholders, also when the municipality maintains full responsibility over the final decision, implementation and maintenance. This works as long as this is clear from the start and the municipality stays committed to the design process. Such a dual role as stakeholder and decision maker can lead to a conflict of interests. Therefore leading the design process is placed in the hands of an independent third party.

Some hope that by involving residents and others, they will assume more responsibility[2]. Urban adapt shows a different picture. The redesign of the public space raised awareness but did not yet lead to residents taking measures in their own home or garden.

[2] See for instance Uitenbroek et al (2019), From Public to Citizen Responsibilities in Urban Climate Adaptation, A Thick Analysis

All in all the effect is that the city, by opening up its public space planning, assumes broader responsibilities leading to a longer, more expensive planning process. However, the results (again in the public space) are more integrated and widely supported.

1. Where to apply

The urban adapt approach relies more on soft institutions to create collaborative initiatives than hard institutions of regulatory enforcement, buy-outs, legal conflicts, etc. This is especially fitting for small local initiatives and areas like river docks that are losing their economic importance, which creates a power vacuum that can be filled by innovative transformations. However, urban adapt shows that also in situations where there are vested and conflicting interests a (more structured and embedded) version of the approach is applicable. Its use is not limited to climate adaptation. Also challenges like sustainable heating, greening the city and mobility may benefit from the approach.

2.   For initiators

The program 'River as a tidal park' and Heliport originated outside of the local government and required good entrepreneurial and communicative skills that not all initiators (either civil servants or citizens) have or need to have. Luckily in Rotterdam there is a growing culture of citizens and civil servants that are apt for this type of initiatives and programmes.

One recommendation to further this model is therefore directed towards all these initiators. They are invited to read and scrutinize the guiding principles and roles present in the urban adapt approach, and copy or adapt them to their own activities.

3.   For the municipality

The third recommendation is for the municipality as a whole. After all, the actions could not have been successful without the municipality. The municipality not only supported the actions themselves but also contributed greatly to many of the conditions for the approach to succeed and deserves praise for this. The most important task for the municipality is therefore to strengthen or replicate these conditions:

1.   Trusting and providing space and initial budgets for initiators that have the position, skills and expertise to engage with other stakeholders and device a collaborative design effort.

2.   Create speedy, diverse, sufficient and flexible funding schemes. Quick funding

is essential for those involved to keep investing their time and effort in a project. Good project opportunities cannot always be planned ahead. This requires flexibility to direct funding to the best opportunities instead of spending money on projects that looked logical on paper at one point but fail to gather momentum in practice. This reduces the financial risks that come from heavy investment in a project or program upfront.

3.   Invest time and effort in the social networks outside the local government. As design processes increasingly take place outside the line and project organization of the local government, the capabilities of these networks become crucial to realize public goals.

4.   Create sufficient organizational capacity for implementation. The designs that come out of this approach are almost by definition multi-faceted, multi-stakeholder and innovative. Moreover critical information may be lost in the transfer of the co-produced design into the municipality for internal technical detailing and tendering. It is more about effectively realizing challenging and important projects than about efficiently optimized workflows.

Colofon: