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Small wins for grand challenges. A bottom-up governance approach to regional innovation policy

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ABSTRACT

Grand societal challenges as a policy target have received increasing attention in regional innovation policy. To date, concrete governance strategies to address such challenges with local solutions are underexplored. We propose a small wins approach as a new governance strategy to deal with wicked societal problems. A small wins strategy focuses on accelerating bottom-up initiatives guided by a shared mission. The aim is to activate propelling mechanisms to support and couple self-organizing change processes. We studied 17 regional initiatives for plastic pollution removal in the Netherlands, which show that i. institutional barriers are the hardest for small wins to overcome and achieve wider impact; ii. bottom-up propelling mechanisms reinforce each other, but are generally too weak to transform existing practices due to limited policy support; and iii. systemic propelling mechanisms are largely absent to achieve robust change processes across scales. We see a key task for regional policy to activate systemic mechanisms that help local solutions upscale. This requires policy to learn about the plurality of change processes ‘on the ground’, and to use multi-level governance arrangements to create coherent policies to scale up bottom-up solutions.

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Bottom-up governance; wicked problems; societal challenges; plastic pollution; mission-oriented innovation policy

1. Introduction

Innovation policy is increasingly directed towards solving grand societal challenges, including climate change, pollution, ageing, obesity and inequality (Schot and Steinmueler 2018; Wanzenböck et al. 2020; Weber and Rohrer 2012). In the wake of this change in policy objectives, there have been repeated calls to regional policy-makers to take societal challenges into account (Coenen, Hansen, and Rekers 2015; Hassink and Gong 2019; McCann and Soete 2020; Uyarra, Ribeiro, and Dale-Clough 2019). However, to date, concrete policy approaches and governance strategies for challenge-based regional innovation policy appear underexplored.

We introduce the idea of small wins as a bottom-up governance strategy for regional innovation policy to deal with grand societal challenges. A small wins strategy focuses on emerging practices and innovations that are small-scale and appear organically in

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different domains. Through accumulation, such incremental innovations can drive transformative change for wicked problems (Termeer, Dewulf, and Biesbroek 2017; Urpelainen 2013; Weick 1984). Mainly applied in the field of governance studies, it is based on the idea that small wins are guided by a bigger vision for change (Termeer et al. 2015). However, instead of aiming for 'big wins' through radical innovation in science and industry, as common in the discourse of innovation missions (Mazzucato 2018), a small wins governance strategy follows a logic of stimulating distributed innovation efforts to foster gradual, yet in-depth change in a desired direction.

Recent regional innovation policy literature engaged with issues of governance mainly in the context of multi-level governance arrangements, such as those created by the 'research and innovation strategy for smart specialization' (RIS3) of the European Union (EU), and the capacity of regional governance institutions to implement these (e.g. Kroll 2015; McCann and Ortega-Argilés 2013; Morgan and Marques 2019). Moreover, to enhance regional innovation performances, studies on industrial clusters, platforms or regional innovation system scholars often derived concrete policy implications in light of the region-specific knowledge endowments and interaction structures (e.g. Asheim, Coenen, and Vang 2007; Asheim, Boschma, and Cooke 2011; Tödtling and Trippel 2005). We argue that a small wins governance approach complements existing regional innovation policy thinking. However, instead of looking at the structural arrangement of regional actors, (non-)local networks, institutions and policies, a small wins strategy targets the processes and mechanisms that can potentially transform the existing system configurations. Herewith, this paper aims to address ways in which small wins can contribute to more challenge-oriented regional innovation systems (Tödtling, Trippel, and Desch 2021) by orientating towards activities that occur on the ground and require upscaling. This dynamic view on governing innovation and change is also consistent with the regional path creation literature (Grillitsch and Sotarauta 2020; MacKinnon et al. 2019; Tödtling and Trippel 2018), which focuses on the conditions for system transformation, and the co-evolution of regional agency, institutions or policies, in support of more sustainable developments of industries and regions.

Importantly, small wins governance starts from the variety of bottom-up initiatives or activities taking place in local contexts. The idea is that the actions 'on the ground', even though small-scale, are often more transformative and responsive to the social, environmental and economic circumstances (Bulkeley and Castán Broto 2013; Fuenfschilling, Frantzeskaki, and Coenen 2019). Hence, innovation does not only take place in entrepreneurial firms or knowledge-intensive organizations, as often assumed by regional innovation policy scholars. From a small wins perspective, change processes are driven by various stakeholders, including users, interests groups, civil society, or the public sector (Termeer and Dewulf 2019). In this sense, small wins governance links more to grassroots innovation or experimentalist governance approaches (e.g. Feola and Nunes 2014; Ferraro, Etzion, and Gehman 2015; Sabel and Victor 2017). These bottom-up approaches became quite influential in addressing societal problems or 'grand challenges' at the local level (Fuenfschilling, Frantzeskaki, and Coenen 2019). Based on alternative future visions or a stronger sense of urgency for change, they promote new practices and solutions, often ahead of formal structures or targeted policy support. As we will argue, building on the interplay of various bottom-up activities, targeted, societal

challenge-oriented regional policies may leverage these activities individually, but more importantly, support the emergence of a series of changes for systemic transformation.

Moreover, a small wins governance approach also speaks to the growing literature on the geography of sustainability transitions (Binz et al. 2020; Coenen and Truffer 2012; Hansen and Coenen 2015) emphasizing the role of local ‘niches’ as testbeds for multi-dimensional change dynamics (Smith and Raven 2012) and the bricolage type of change processes (Boschma et al. 2017). A small wins governance strategy is consistent with this line of argumentation, but sets itself apart from other bottom-up strategies such as strategic niche management (e.g. Smith and Raven 2012), as small wins do not emerge from niches that are shielded from existing regime structures (Boschma et al. 2017; Smith and Raven 2012). Their small size makes them seem unthreatening to established actors and thus provides some form of protection (Termeer and Metze 2019). Small wins can be of technological, social or institutional nature, and emerge in the private and public sector, civil society or the local community. The small wins perspective allows analyzing local sustainability transitions beyond single niches, or niche-regime interactions, and thereby includes more actors and different actions.

Our paper aims to uncover the potential, opportunities, and challenges for regional innovation policy in pursuing a small wins governance approach in support of challenge-led innovations. To do so, we focus our research specifically on the empirical case of regional bottom-up initiatives targeting the wicked problem of plastic pollution in the Rotterdam area and along Dutch waterways. Our empirical analysis focuses on the presence, absence and functioning of the propelling mechanisms necessary for small wins to overcome barriers for system-wide transformations. We will use the findings of our case study to derive a set of policy implications for more transformative regional policies directed to grand societal challenges and help small wins achieve in-depth changes in and beyond regions.

Our paper is structured as follows. In Section 2, we introduce small wins as a bottom-up governance approach with its six propelling mechanisms. In Section 3 we present our case study on 17 regional bottom-up initiatives to combat plastic pollution in Dutch waterways, followed by the empirical analysis of the barriers, the functioning of propelling mechanisms of these regional small wins and an example of how propelling mechanisms may help to overcome barriers in Section 4. Section 5 synthesizes the results, based on which we derive implications for regional innovation policy in Section 6.

2. Governing small wins

2.1. Small wins

The governance approach of small wins was introduced in the public administration and environmental governance literature to deal with wicked societal problems such as climate change, health care, or education (Bryson 1988; Termeer, Dewulf, and Biesbroek 2017; Urpelainen 2013; Weick 1984). As for other incrementalist approaches to wicked problems (Daviter 2017; Roe 2016), the notion of small wins is inspired by Lindblom’s ‘muddling through’ approach (Lindblom 1979) for policy-making under bounded rationality, and rooted in organizational science (Reay, Golden-Biddle, and Germann 2006). The core idea holds that transformative change follows from continuous, yet

in-depth change, instead of rapid, radical change (Termeer and Dewulf 2019). Thus, the aim is to achieve small wins instead of a 'big win' (Bryson 1988). In this respect, small wins governance differs from some of the current mission-oriented innovation policy approaches, which often call for bold policy actions driven by radical change, large-scale impact and the urgency to tackle grand societal challenges (Mazzucato 2018; Robinson and Mazzucato 2019). Mission-oriented policies thereby do not consider the place-based orientation that is important to small wins operating mostly on a local scale.

From a governance perspective, a small wins approach follows the idea that transformational change processes are generally messy and contested, and thus, call for more modest policy planning demands (Termeer and Metze 2019). The reason is the wicked, unstructured and multi-dimensional nature of underlying problem structures, which can easily overwhelm policy-makers (Peters 2017; Turnbull and Hoppe 2019). Overly scaled problems may somewhat impede instead of support innovative action, and involve the risk of stagnating in old practices without achieving progress. Instead, established routines and systems can be better transformed incrementally through cultivating a series of small wins.

Accordingly, small wins are defined as concrete, in-depth changes (Weick 1984), which get reinforced over time and accumulate into transformative change through non-linear mechanisms (Termeer, Dewulf, and Biesbroek 2017). Termeer and Dewulf (2019) suggest in a first conceptualization of the small wins approach four crucial small wins characteristics. First, small wins should yield *concrete outcomes* with visible results, going beyond promises or mere ideas to implement activities. Second, small wins are expected to alter current practices. In contrast to 'quick wins', they refer to *in-depth change* such as deviations in routines, beliefs or values and by breaking with current mindsets reflecting the composition of the prevailing system. Third, small wins are of *moderate importance*, operating at a local or regional level. Even though small, they have the potential to be *seeds of transformative change*, as the local level provides opportunities to achieve profound change at low levels of turbulence (Termeer and Metze 2019; Vermaak 2013). Fourth, small wins should be *judged positively* as a step forward or an improvement from their predecessors or prior state. Even though a positive response by one party can be perceived as harmful by another, small wins are actions that are beneficial to a group of actors, without directly hurting opponents (Termeer and Dewulf 2019). With these characteristics, small wins can refer either to technical or societal innovations, but also to institutional changes that support the societal infrastructure for these innovations to flourish.

The governance strategy of small wins is a gradualist strategy, where small and consecutive actions need to be undertaken to achieve change in emerging systems, all guided by a shared ambition or a 'big dream' (Urpelainen 2013). As other bottom-up governance approaches, it assumes actors will start experimenting with practical solutions when a shared problem arises (Sabel and Zeitlin 2012; Sabel and Victor 2017). This 'directionality' or ambition for change can drive bottom-up innovation, even though the problem is contested. At the same time, it can cause resistance and barriers that are hard to overcome for small wins (Termeer and Metze 2019). As small wins concern in-depth change directed to solving a societal challenge, tensions are bound to occur. It can even be argued that if a small change effort does not create tensions for the established system of institutions, it will not contribute to transforming it

(Termeer and Metze 2019). New solutions can meet political or societal resistance if they go against social norms, vested interests, or established routines.

Moreover, proposed solutions may conflict with existing regulations, policies, or budgetary norms, which requires these solutions to overcome barriers. In such complex change processes, regional innovation policy may, compared to national or supra-national policies, have some leeway to focus on resolving or alleviating these tensions case-by-case, to support the actors involved in continuing their activities to overcome barriers, and to keep the momentum of change. At the local level, political and societal barriers related to ongoing transition processes can be more easily managed (Vermaak 2013; Weick 1984). The experiences gained can be used to scale up and diffuse the initiative to other places, beyond the local case-by-case approach through the design of generic and trans-local policies, standards or regulations (Wanzenböck and Frenken 2020).

2.2. Propelling mechanisms

A small wins approach acknowledges that one small win is not enough, but multiple small wins – borne by a variety of people, organizations or networks – are required to achieve progress in a societal challenge. Termeer and Metze (2019) suggest that a bold ambition provides both motivation and direction in self-organized change processes. In this respect, a small wins perspective on regional innovation policy is consistent with mission-oriented innovation policy, where a mission statement by a government can provide guidance and legitimacy to a variety of actors and solution paths (Hekkert et al. 2020; Wanzenböck et al. 2020). More importantly, however, are the mechanisms that encourage actors to continue their innovative efforts despite the uncertainties involved. Termeer and Dewulf (2019) called such activating mechanisms ‘propelling mechanisms’, defined as non-linear chains of events that reinforce themselves through positive feedback loops to create increasingly favorable outcomes. The assumption holds that, if the right mechanisms get activated, they create an accumulation of small wins that eventually lead to in-depth and transformative change. They distinguish between six propelling mechanisms:

- (1) ‘Energizing’ describes the activation of other small wins because they get energized and inspired from initial small wins. Activation follows from demonstrating an innovation’s feasibility and the actors’ ability to accomplish visible results. Successes thus generate commitment and trust that change is possible;
- (2) ‘Learning by doing’ is activated when the feedback and system reactions from first experiments get implemented in follow-up activities. One can learn from preceding small wins’ strengths and flaws, and therewith determine future strategies;
- (3) The ‘logic of attraction’ gets activated when resources start to flow to the ‘winners’. Highlighting positive results and success stories (e.g. by influential actors) can reduce resistance, create credibility and mobilize additional resources for the small win;
- (4) The ‘bandwagon effect’ is an effect of inspiration and imitation occurring when others adopt actions or new ways of organizing. Reputation and a positive image are considered useful for small wins to diffuse, spatially and temporally;
- (5) ‘Coupling’ has a stimulating effect when small wins combine with other ambitions across geographical scales, or can break the boundaries of businesses, societal or

policy domains. In this sense, synergies can create transformative effects that are greater than the sum of separate parts;

- (6) 'Robustness' occurs when small wins have become so numerous and strong that they result in newly institutionalized practices and sustained change. They reach a 'point of no return', and get further strengthened when the benefits of the innovation spread.

While some mechanisms might indeed be stimulated bottom-up, by the initiators or volunteers, other mechanisms may require the support of policy-makers to overcome the barriers and tensions characterizing institutional change processes. Termeer and Metze (2019) therefore suggest policy-makers to inquire which mechanisms are present and to come up with hands-on policy actions to make small wins for a certain problem accumulate. The exact problems encountered, and policy actions taken highly depend on the context of the societal challenge and the local contexts in which small wins are attempted.

Comparing the propelling mechanisms to the scaling of niches, we observe some differences to strategic niche management (SNM) approaches from sustainable transition literature (Smith and Raven 2012). For instance, the argument of 'shielding' to protect path-breaking innovations from mainstream selection pressures does not apply to small wins. Typically, small wins are not protected by policy from existing regime pressures but are successful if they can, at least partly, overcome these structural barriers (Termeer and Metze 2019). The 'nurturing' activities to achieve expansion and performance improvements of innovations (Boschma et al. 2017; Smith and Raven 2012) may be related to small wins propelling mechanisms. However, a small wins approach targets more the accumulative processes and series of changes that help small wins to gain relevance and grow. Also, this accumulation of small wins is organized to deviate from routines, beliefs, or values; to break with current mindsets; and to achieve in-depth change (Termeer and Dewulf 2019). Thus, for small wins, 'empowerment' activities as in SNM, aimed at making innovations either fit-and-conform with, or stretch-and-transform from existing selection environments (Smith and Raven 2012), are only relevant if they can stimulate the self-reinforcing processes to institutionalize new norms and routines within existing structures and practices.

In the following, we present a case study on regional bottom-up solutions targeting the wicked societal challenge of plastic pollution in Dutch waterways. In our empirical analysis we will, first, pay attention to the encountered barriers of these small wins, and how actors managed to overcome them, or failed to do so, and, second, investigate the presence (or absence) of propelling mechanisms that support (or hinder) the growth and diffusion of the small wins.

3. Methodology

3.1. Case selection

This study follows a qualitative approach to analyze bottom-up initiatives in the Netherlands contributing to the joint policy objective of the Ministry of Economic Affairs and Climate Policy (Keijzer 2019) and the Ministry of Infrastructure & Water Management (Van Nieuwenhuizen Wijnbenga and Van Veldhoven-van der Meer 2018) to achieve

plastic-free waterways. The policy can be considered as an innovation policy addressing a grand challenge (plastic pollution) and has a mission-type character with the ambition to drastically decrease plastic pollution by 2030 (Ministry of Economic Affairs and Climate Policy 2019). The policy is a regional policy in that it focuses on waterways, which is considered the most polluted areas with plastic debris (Ritchie and Roser 2018). The Dutch ministries carry a shared responsibility for the large volume of waste that reaches the North Sea via the rivers Rhine and Meuse (Rijkswaterstaat 2018).

Generally, initiatives aiming for plastic-free waterways can deal with prevention, recycling or removal. To ensure comparability of the cases, we included only initiatives that focus on 'removal'. Removal initiatives are likely to have a clear visible result to litter-free waterways and focus on the post-consumer phase, where plastic ends up in the environment. To identify and select relevant initiatives, purposive sampling was used based on specific criteria. We sampled ongoing initiatives for plastic removal in waterways that meet the criteria of the four characteristics of small wins (concrete outcome, moderate importance, in-depth change, judged positively). In a first step, relevant initiatives were identified using a keyword search¹ through Google, Google Scholar and LexisNexis.

To characterize the initiatives as small wins, we further delineated the sample based on information from initiatives' websites, news articles, reports and scientific literature. This results in 17 initiatives initiated between 2012 and 2017 which meet the four small wins criteria. The initiatives all go beyond promises and ideas and therewith show 'concrete outcomes' in form of either technical, societal or networking and supporting measures. Their 'moderate importance' appears from the fact that these measures are executed on a small scale before implementation on larger scale can take place. This often involves local pilots in one geographic location. The 'in-depth change' generated by the small wins becomes evident from the behavioral change of citizens, companies and governmental organizations, such as municipalities. Hereby, initiatives induce change for instance through breaking and opening mindsets to understand the problem from a different perspective. 'Positive judgements' of small wins are observed from initiatives being rewarded prizes or acquiring additional resources, both human and financial.

3.2. Sample description

Table 1 provides an overview of all initiatives, which are located in the Rotterdam area or along Dutch waterways. Some operate at multiple locations, e.g. along the Meuse in Limburg and Brabant, while most are concentrated in one area. Particularly, the technical initiatives are located in the Rotterdam harbor or Greater Rotterdam area. The geographical concentration around Rotterdam can be explained because it is one of the main outlets of the Dutch waterways into the North Sea. However, societal problems do not end at regional borders. Therefore, many of the societal or networking and supporting initiatives aim to connect or support actors across Dutch waterways. The initiatives are all rather recent, with a maximum duration of eight years and a minimum of two years. Since the foundation of the initiatives, two actors ceased their operations and transferred their responsibilities to other parties, but remained active in the field to support other initiatives or in advisory roles.

Table 1. Initiative information.

Category	Number	Short description/aim of initiative	Location*	Founding year**
Technical	T1	Non-profit small initiative. Waste catching technology and clean-ups on land.	Rotterdam harbor	2014
	T2	For-profit small initiative. Waste catching technology to clean water.	Rotterdam harbor	2016
	T3	Consultancy and engineering firm. Waste catching technology to clean water.	Rotterdam harbor	2016
	T4	Consultancy and engineering firm. Waste catching technology to clean water.	Rotterdam harbor	2015–2019
	T5	Maritime service provider. Co-developer with one of the waste catching technologies	Greater Rotterdam Area	2015
	T6	Contractor for Green, Infra, Water and Sports. Co-developer with one of the waste catching technologies.	Greater Rotterdam Area	2017
Societal	S1	Non-profit small initiative. Organizing clean-ups on land and shores.	Dutch waterways	2016
	S2	Retail shop selling eco-friendly Ripstop nylon bags. Collaborated in organizing and participated in a clean-up.	Greater Rotterdam Area	2019
	S3	NGO achieving to create a plastic-free environment and in contact with small initiatives.	Dutch waterways	2011
Networking & Supporting	N1	Executive agency of the Ministry of Infrastructure and Water Management set up agreement for clean-ups around waterways.	Dutch waterways	2017
	N2	Partnership between provinces of Brabant and Limburg, Ministry of Infrastructure and Water Management, water boards, municipalities, local parties, companies and volunteers around the Meuse.	Dutch waterways	2016
	N3	Partnership across the border with Belgium and Germany among municipalities, water boards, universities and Ministry of Infrastructure and Water Management.	Dutch waterways	2012
	N4	Municipality. Support for organizations.	Greater Rotterdam Area	2016
	N5	Municipality. Support for organizations.	Dutch waterways	2019
	N6	Port authority set up program for further development of innovative ideas to create a better environment in the port.	Rotterdam harbor	2016–2018
	N7	Maritime accelerator, set up program for technical innovation generators.	Rotterdam harbor	2016
	N8	Community of Practice Plastic (CoPP). Collaboration community to gain joint knowledge on plastic pollution.	Rotterdam harbor	2014

Notes:* Only the initial starting location is considered. Some initiatives later moved to other markets in Asia for example (T1, T2). ** For two initiatives (T4, N6) the later date refers to the year they transferred their responsibilities and ceased to exist.

Out of the seventeen initiatives, six relate to technical innovations, three to societal initiatives, and eight to networking and supporting initiatives. ‘Technical’ measures contain tangible technical innovations such as waste catching systems for waterways (T1, T2, T3, T4) which are characterized by efforts of research, development and demonstration. Most of these technical innovations were still in the development phase, testing their technologies and performing pilots (T2, T3, T4). The aim of these

innovations is to improve the local environmental conditions and create good quality waterways, by removing litter from water areas and on land (shores), to improve local fishing conditions and create better circumstances for tourism. Also, (automatic) technologies improved working conditions for cleaners that would normally clean rivers by hand (T2). Larger private organizations that started to work together with initiators of promising technical innovations were also observed (T5, T6).

'Societal' activities revolved around community-based clean-up strategies of shores and beaches (S1, S2), based on pollution awareness campaigns (S1), or educational and lobbying activities for changing policies (e.g. deposits on small plastic bottles) (S1, S3). These societal activities mainly aimed at influencing litter behavior of citizens or larger corporations. For example, by investigating problematic areas with excessive littering, where they discovered and took appropriate measures on a corporations' employees who littered plastic packaging around the building during lunch hours (S1).

Lastly, 'networking and supporting' measures primarily assisted other initiatives by providing financial, human or contractual support in the form of additional resources. These include organizing activities such as monetary intervention programs (N4, N6, N7), communities or networking events (N6, N7, N8) and stimulating performance contracts and regulations (N1, N2, N3, N4, N5) e.g. contracts to ease waste disposal after clean-ups. Examples of supporting actors are the port authority, the executive agency of the Ministry of Infrastructure and Water Management and municipalities. These measures were set up so that technical and societal initiatives faced less barriers or were able to produce more, easier and faster results (N1, N4, N6). Additionally, these measures aim at creating more awareness for the problem of plastic pollution and its solutions (N1, N2, N3, N8). Even though there is variance among these initiatives, they all support others in achieving plastic-free waterways.

3.3. Data collection and analysis

After selecting the initiatives based on desk research, we collected empirical data on these initiatives through 17 qualitative semi-structured interviews. The goal of the interviews was both to gain in-depth contextual knowledge on the initiatives and to understand the actor's perceptions regarding barriers and propelling mechanisms that constrained or helped them to achieve success. Herein, we tried to come up with the most likely scenario for the events that we observed (Reichertz 2004). Hence, our conceptual focus on small wins barriers and propelling mechanisms explicitly structured the interviews in an abductive fashion. Following the logic of an abductive research approach from Van Hoek et al. (2005), we started from deriving theoretical knowledge on wicked problems and small wins as the basis for this research. Second, the real-life observations, i.e. the 17 regional, bottom-up initiatives, were studied and actors interviewed to understand their perceptions of the social world and to identify what corresponds or deviates from the theory (Blaikie 2010). Herein, 'theory matching' was applied (Dubois and Gadde 2002), in which the aforementioned theoretical insights are extended based on the empirical observations as presented in Section 4. Finally, abduction was used to suggest general rules and/or propositions based on theoretical insights, which in our case relate to the theory and policy implications we formulate in Section 5 and 6. All interviewees were highly involved with the initiative, ranging from Project Manager to

Start-up Coach or Harbor Master. An overview with details on the interviews can be found in Table A1 (Appendix 1).

In our analysis, we paid explicit attention to two aspects. First, the small wins' ability to overcome barriers. Here, we identified different types of barriers encountered and how actors managed to overcome these barriers or failed to do so. Second, the propelling mechanisms, which demonstrate the stimulating measures experienced by the initiatives and how they affected the small wins' growth. Each interview was transcribed, and the content was coded with the software NVivo. The initial set of codes was constructed based on the small win characteristics and propelling mechanisms as discussed in theory. Additionally, through open coding, new codes were derived inductively if observations were not captured by theory. Then, related codes were grouped into different types of barriers and propelling mechanisms. The initiatives were analyzed in the period from June 2019 until March 2020.

4. Results

4.1. *Plastic pollution in Dutch waterways: problem context*

As a first step in analyzing small wins regarding solving plastic pollution, we aim to understand the wicked nature of the problem, and what makes it so hard to address this challenge effectively. Plastic pollution is considered a global issue that affects many regions in the world (Vince and Hardesty 2017). The large number of actors, the lack of clear responsibilities, and the fragmented nature of previous policy efforts result in plastic pollution appearing wicked, both in its problem definition and in its possible solutions (Wanzenböck et al. 2020).

We found that the wickedness of the plastic pollution problem does not so much lie in understanding its root cause (the widespread use of plastics), but in the lack of responsibilities for those accountable for the problem. As for many environmental problems, 'waste does not have an owner, only a polluter' (T5). Interviewees indicated that responsibilities are also often 'transferred' between public actors and suggested that national or European governments should take the lead by setting out clear regulations for producing, recycling and consuming for organizations and individuals (T3, T4). The wickedness of combatting plastic pollution by removal is further evident from the various solutions pursued in parallel. Our interviewees brought up various solutions as promising ways to go forward, from bans on plastic (N4), over deposits on bottles and cans (S1, N1), to providing only degrading plastics (N4) or closing the loop (T1, S3, N4). The multitude of solutions causes a high degree of uncertainty regarding the future support and regulations regarding each initiative. Finally, wickedness is apparent from the complex nature of the problem for which solutions may have unintended effects. For example, initiatives cleaning up litter from the environment with a given technology (solution), are struggling with what to do with the collected plastics (T1, T5, N4 and N6). As actors cannot deal directly with the root problem (use of plastic), they can only engage with partial solutions, which then cause additional problems (collected plastic).

4.2. *Barriers*

As we argued, small wins may overcome wicked problems by fostering incremental changes to achieve sustainable results. Nonetheless, small wins tend to face resistance

and need to overcome barriers if they aim to achieve in-depth change. Additionally, the contestation, complexity and uncertainty surrounding the plastic pollution problem can obstruct initiatives or solutions from growing and scaling. The barriers we derived from our empirical observations can be categorized into three types of barriers: institutional, organizational and knowledge barriers.

'Institutional barriers' come down to resistances due to current institutions on the national and European level. This has led to obstacles for testing ideas and implementing innovations or new regulations being experienced by two initiatives (T4, N1). Actors experienced the Netherlands and Europe in general as lagging to adopt innovative ideas and implementing them (T2, T6). Also, permits and safety measures are mentioned to prevent pilots from being conducted (S3, N6). Other than regulatory obstacles, also the fragmented character of the Netherlands, in which 'every region has its own decision-making procedures, ambitions, targets and priorities' (T4), is argued to be a barrier for creating uniform solutions or regulations to be upscaled for the Netherlands as a whole. One initiative was not able to overcome these institutional barriers and had to terminate its activities (T4). Another initiative relocated to a place where safety regulations were less strict (T2), while yet another initiative adjusted its business model (N6). It seems institutional barriers are the hardest to overcome for bottom-up initiatives because of the rigid character of established practices and regulations in dealing with plastic removal.

Some initiatives also experienced internal 'organizational barriers' related to, for example, employees' resistance to organizational change or cumbersome inter-organizational partnerships. Two interviewees acknowledged the difficulties experienced when old routines are changed (T1, T6), and attempted to involve their employees more closely in organizational change processes. Tensions can also come from inter-organizational partnerships, mainly stemming from organizational differences between companies of different sizes (T2, T5, T6, S1). Whereas larger corporations emphasize the voluntary basis of the collaboration (T5, T6), small organizations are dependent on financial resources from large organizations (T2, S1, S2, N6), as 'smaller initiatives search for connections with larger companies, for investments in material for example' (N4). It seems that these organizational tensions are difficult, but not impossible to overcome as organizational problems can be solved internally or bilaterally.

Finally, 'knowledge barriers' were encountered when transferring too much or too little information. This type of barrier was often observed for initiatives that collaborate in communities, such as the Community of Practice Plastics (CoPP). The CoPP is a collaborative community that aims to better understand the problem of plastics in rivers by conducting joint research, sharing knowledge and resources (N8). Hence, it is crucial for members of the community to share information and engage in joint learning. On the one hand, multiple interviewees (T1, T3, N6) indicated that too little information is shared in the community, leading to, for example, resources being 'wasted' (T1). On the other hand, initiatives are not too keen on sharing their knowledge with others and want to 'keep their card close to their chests' (T3). Even though community-based initiatives such as the CoPP aim to facilitate knowledge transfer, members feel that too little information is shared among community members or, reversely, feared their knowledge would spill over involuntarily. Additionally, knowledge barriers can occur due to a lack of understanding of the urgency and relevance of the initiative or innovation (S1, N1

Table 2. Identified barriers.

Barriers	Institutional barriers	Organizational barriers	Knowledge barriers
Characteristics	Rigid administrative institutions	Intra-organizational resistance to change	Resistance to share knowledge and information
	Rigid regulatory institutions	Frictions in inter-organizational partnerships	Differences in problem perception and urgency to act

and N2). [Table 2](#) provides an overview of the barriers and their characteristics based on our analysis. Further evidence from the case can be found in [Table A2](#) ([Appendix 2](#)).

4.3. Propelling mechanisms of small wins

In the small wins perspective, propelling mechanisms have a central role. These mechanisms are expected to stimulate small wins, and help them overcome the institutional, organizational or knowledge barriers. We follow the six mechanisms as identified by [Termeer and Dewulf \(2019\)](#) in analyzing the functioning of propelling mechanisms.

The ‘energizing’ mechanism is in place once concrete outcomes and visible results inspire others to look for new wins. For the initiatives we studied, we could observe such energizing dynamics for both technical and societal solutions for the plastic pollution problem. Enthusiasm of the initiators, a positive framing (of the ‘good cause’), and sharing the story about own endeavors increased the attention and public acknowledgement of both the plastic pollution problem and the proposed innovations (T5, T6, S2, N4). In one case, a waste collector initiative (T5) directly inspired others to experiment with new products from the collected river plastic. Energizing, considered as a form of spillovers from enthusiasm and conviction about the good cause, works mostly via social media or face-to-face through personal networks. Here, the innovators can demonstrate how easy it is to set up a technology or a social event (T2, T3, T4), or to pioneer new partnerships and programs with societal benefits (N1, N2, N6). For small initiatives, the main goal of these activities is to increase the visibility and trust in their activities, for instance by finding new partners (T5, T6, S2), new financial means or human resources (T1, T2, S1) to expand their business. By pursuing their own goals in light of a good cause, initiatives can become role models or examples for others. We find the dynamics of energizing to be important throughout all stages of development, starting from initiation where only ambitions, ideas and action plans are present (T4), over demonstrating the first visible results (T2, N6, N7, N8), to organizing the pilot runs (T1, T4, S1, N1).

‘Learning by doing’ as propelling mechanism appears when first concrete results of small wins reveal previously unseen obstacles, thus encouraging reflection and improvement of subsequent initiatives. We found learning by doing to take place both technologically regarding the design of a solution to the plastic problem, and organizationally regarding the management of an initiative. Technological learning during pilots or tests was experienced as essential for the (technical) innovators, not only to detect design flaws (T1, T2, T4, S1) but also to collect feedback and learn from past experiences (T4, N1, N2). Learning through own experience gives the actors guidance on how to pursue their vision further. Moreover, the local CoPP contributed to shared learning among participants. Providing a shared space and mutual engagement facilitated

networking among actors, with opportunities to exchange knowledge and own experiences with possible solutions to the plastic problem. In organizational terms, acquiring new management, marketing or strategic skills was considered necessary, especially for small initiatives to cope with organizational growth and expansion of assets and people (T1, T2, T5). To stimulate these learning dynamics, we observed the importance of supporting actors, such as regional authorities who can act as launching customers (N4), or private investors who join the initiatives in the expansion and commercialization phase (T5, T6). These supporting actors take risks, invest and provide material (e.g. test locations), financial (e.g. subsidies) or human resources (e.g. experts) necessary for small innovators to identify potential technical and organizational pitfalls already in the test phase, before implementing on larger scale.

The 'logic of attraction' as propelling mechanism is activated when 'winners' become visible and, due to their first achievements, can attract additional resources. Even though gaining a good reputation and credibility seems generally challenging for small initiatives, we observe several dynamics that help increase the projects' and actors' visibility. First, innovators see the engagement of larger organizations or high-level public actors, such as national or European authorities, as key lever to increase public recognition and impact of their activities (T1, T2, T3, S1). This logic of attraction via influential actors is acknowledged by most of the interviewees. In the context of a prominent initiative, one interviewee stated that 'there are large companies [...] who transfer 'him' one or two million euros per year to do whatever he wants with it' (T5). Second, dedicated societal support actors attempt to increase the visibility of small-scale initiatives by 'selecting winners' and catalyzing funding for projects they regard as promising. Examples are targeted programs for impact acceleration, tenders or market consultations (N1, N4, N6, N7). In addition, due to successful participation in competitions or awards, the projects could reach a larger public, acquire additional finances or find sponsoring to implement follow-up projects and stimulate the impact of the initiative (T1, T2, T3, T4, S1). Here, the logic of attraction can activate additional resources. However, many initiatives experienced a lack of specific support schemes, and of structural partners (T1) or volunteers (S1) that help to create societal impact. Lastly, interviewees acknowledged that, next to the involvement of influential actors or support schemes, market forces can eventually determine which initiatives become winners and can acquire additional funds to grow (N4). However, currently, the absence of business cases for in waterways collected plastic is regarded as the biggest hurdle in this regard.

The 'bandwagon effect' refers to the 'pull mechanism' that feeds back to energizing and the logic of attraction. The role of spreading stories about best practices is especially important for others to be aware of what is possible. After a first step is taken, others might more likely follow and copy the practices of others. For the case of plastic removal, a dominant design for a solution to deal with plastic in waterways has not yet emerged, since existing designs are imitated just as new ideas are developed. However, instead of pushing for more convergence and standardization in the market, technical innovators rather try to increase the consciousness about the local plastic problem. Their ambition is to set a positive example, and inspire others with their success stories, for instance via media channels (T1, T2, T5) by organizing events or lectures (T1, T3), or showcasing achievements to important political representatives (N2, N3). The prominence of the CoPP in the region is considered as particularly

advantageous in this regard. Very different actors and organizations with a common interest in solving the local plastic problem come together, contribute to knowledge transfer and in this way ensure the local plastic community to grow. Some interviewees (T3, N7) refer to it as the ‘Golden Goose’ effect of the community; ‘it keeps on growing and getting bigger. Everyone that does something with plastic gets involved’ (N6).

Table 3 summarizes the first four propelling mechanisms and the dynamics identified in our analysis. Further evidence based on interview quotes is provided in Table A3 (Appendix 2). The mechanisms have in common that they stem closely from the actions, efforts and concrete outcomes of specific initiatives. We thus refer to them as ‘bottom-up propelling mechanisms’; they stimulate learning, spillover and pull effects between actors on the ground, within and across initiatives, but support primarily the respective small wins to uptake and grow. The extent to which they are present differs for the type and size of the organization initiating the small win. Smaller organizations tend to attach more value to the ‘logic of attraction’, since receiving credibility is crucial for their survival and growth, especially because it is not naturally present for them. Larger public organizations tend to value more the ‘bandwagon effect’, as they aim to set an example, be it on a small scale initially, but intending to spread wide and get imitated by others.

In addition to the bottom-up mechanisms, there are two propelling mechanisms with an inherent systemic character, namely ‘coupling’ and ‘robustness’. The functioning of these, as we call them, ‘systemic propelling mechanisms’ is expected to accelerate change dynamics beyond the scope and topic of the small win and to contribute to system-wide innovation. The more systemic coupling occurs across geographical scales, actor types or societal domains. The more the small wins touch upon deeper societal structures, the more likely we could speak of dynamics related to system transformations. Then, robustness refers to the ‘point of no return’, where returning to the initial situation is no longer possible because actors get used to the new situation and over time develop new routines with new norms (Termeer and Metze 2019).

Regarding ‘coupling’, all actors recognize the difficulty of addressing a complex societal problem individually and the need for collaboration. As discussed, finding partners is important for small organizations to gain credibility and resources (T1, T2, T3, S1), while for larger organizations collaborations can be valuable to create a reputation of being environmentally conscious (T5, S2). In addition, mutual engagement in the local plastic community (N8) is considered crucial to foster synergies between the different private or public initiatives. In the community, coupling occurs because of a shared ambition or challenge (i.e. combating the local plastic problem), and thus happens across the boundaries of the initiatives’ business or focus areas. There is even

Table 3. Bottom-up propelling mechanisms.

Propelling mechanisms	Energizing	Learning by doing	Logic of attraction	Bandwagon effect
Dynamics	Inspiration	Technological learning	Acknowledgement by influential actors	Copying designs
	A good cause	Organizational learning	Positive evaluation	Set an example for others
	Continuous aspiration	Acquire additional resources	Market forces	Community feeling

a nascent local ‘value chain’ for plastic waste, as one initiative is collecting waste (T1, T3, T4) and others use it as input to produce new products from it (T5, S2). It is noteworthy that despite some coupling efforts across national borders (N2, N3), the majority of the initiatives did not stretch beyond the region of origin. In all, we found that systemic coupling dynamics appear to be present beyond individual initiatives, but they are relatively limited in scale and scope.

Regarding ‘robustness’ as a propelling mechanism, many initiatives lacked strategic partners or clients (T1, T2, S1), time and budget (T3, T4) with the result that most innovations remained relatively small-scale with limited to no economies of scale (T2) and impact. And, even though some of the technical innovations had been launched on the market, few were replicated across the Netherlands (S1, N1) or got scaled for markets in foreign countries (T1, T2, N7) during the time of study. The yet limited institutionalization of new markets and societal practices indicates that the small wins did not accumulate sufficiently, and robustness has not yet been achieved. Promising solutions remained small, or are still of moderate importance, but none of them has developed or legitimized itself as new standard or practice for plastic removal.

According to some interviewees (S3, N8), the difficulty of overcoming these expansion barriers can to a large extent be attributed to inconsistent policies with regards to plastic in water or missing regulations across governance levels and policy domains, which can be addressed as institutional barriers. Consequently, water managers who secure the water supply, did not see the need to intervene and take responsibility (N8). We understand this as characteristic for a wicked problem where parties keep reasoning in circles and upscaling is stifled. Moreover, we did not find evidence for efforts connecting plastic removal as a (local) environmental problem with other societal or policy domains, such as the food, energy or health sector. The plastic pollution problem overlaps with those areas in cause and effects, but existing initiatives, both in the Greater Rotterdam Area and across the Netherlands, do not seem to address these systemic linkages. Nevertheless, large actors seem to be optimistic about the future, as an increased interest in the plastic problem has been observed over the last years (T5, T6, S3, N8). Some even talk about a ‘paradigm shift’ (T5), as people and companies now take more responsibility for their actions, which increases the public acknowledgement for alternative solutions. For companies, the fact that plastic pollution is an even greater problem in other countries (e.g. in Asia) provides opportunities for more ‘export potential’ (N4) and new markets for innovative solutions.

Table 4 provides an overview of the last two propelling mechanisms and the dynamics involved to stimulate (or constrain) small wins. More evidence on these mechanisms can be found in Table A4 (Appendix 2).

Finally, to illustrate the effect that propelling mechanisms may have on overcoming barriers, we describe one example case in more detail in Box 1. Through this example,

Table 4. Systemic propelling mechanisms.

Propelling mechanisms	Coupling	Robustness
Dynamics	Connection across scale (geographical and organizational)	(Difficulty to) Going beyond premature state
	Shared challenge	(Absence of) Coherent national and European regulations

we demonstrate potential effects and interactions among propelling mechanisms and barriers. The case illustrates in some more detail how an activity, in this case related to coupling, can help overcome part of the 'knowledge sharing problem', and also positively affects 'learning by doing' and 'logic of attraction'. Still, because of the 'inter-organizational barrier' and the risk of 'imitation', additional problems are created. The example sheds light on the interlinkage between the two, but because of persistent barriers, the wickedness that is inherent to the problem of plastic pollution in waterways is still observed, as described in Section 4.1.

Box 1: Example case effect propelling mechanisms on overcoming barriers.

To give an example of how barriers translate into propelling mechanisms, we start from the barrier of 'knowledge sharing'. Barriers to knowledge sharing are experienced by multiple initiatives in the sub-optimal use of each other's knowledge and resources (T1, T3, N6). As multiple organizations have the same question, e.g. 'how much plastic can be found in our waterways', but everyone conducts their own research, it would be better to coordinate. To address this issue, the Community of Practice Plastic (CoPP) (N8) was founded. The CoPP can be described as an activity of 'coupling', because multiple initiatives 'share and develop knowledge on a societal theme that we share a passion for' (N8). Within this local community, coupling occurs across actor types, and organization size, as smaller technology-based organizations (T1, T3, T4) collaborate with larger supporting and network-based organizations (S3, N1, N4, N6). The effect of coupling led to more knowledge and information being shared. This was recognized by the initiatives involved: 'the collaboration in the CoPP has contributed to our initiative by sharing information, making improvements and scaling up' (T3). Thus, the CoPP contributed to overcoming the barrier of knowledge sharing, and created additional opportunities for (1) 'learning by doing', and (2) on the 'logic of attraction'. Regarding the former, more joint pilots were executed, such as between a technical initiative providing a waste catching technology and a university to investigate the types of plastic collected from waterways. Concerning the logic of attraction, smaller initiatives gained additional credibility, which led to an increase in their public attention and financial resources (T1, T3, T4). However, as described earlier, some initiatives also experienced limits to knowledge sharing within the community of practice, which was against the desired outcome. This can be explained by the additional 'inter-organizational barriers' that emerge from the collaborations among actors within the community. For some, collaborations increased the risk of imitation and copying. Even though, the bandwagon effect is assumed to have a positive effect on stimulating system-wide change, it can be experienced as undesirable by single actors and initiatives, and may even set back the accumulation of the systemic change processes characteristic for small wins.

5. Discussion

This study presents small wins as an alternative governance approach to regional innovation policy to address grand societal challenges. A small wins strategy puts emphasis on continuous incremental change to achieve sustainable results. By activating propelling mechanisms, policy can accelerate multiple ongoing innovation efforts that are of relatively small scale. If these small wins accumulate, systemic change in a certain direction might be achieved more easily.

Our study of regional initiatives to combat plastic pollution focused on the analysis of the small wins' propelling mechanisms through which local accumulation along Dutch waterways took place and the barriers that hindered upscaling and a wider diffusion of these initiatives. As we show, many of these initiatives, be they of technical, societal or networking and supporting nature, did emerge organically, through the change ambitions and self-organized efforts of individuals, organizations and collectives. Crucial for emergence, growth and impact were the so-called 'bottom-up propelling mechanisms', related to (1) energizing (being an inspirational example; showing what the initiative is capable of doing); (2) learning by doing (doing pilots to learn from mistakes); (3) logic of attraction (attracting resources) and (4) bandwagon effect (copying of an initiative), which stimulated the accumulation of small wins. Despite these bottom-up mechanisms, our study shows that new practices and

innovations still face difficulties in embedding and exerting impact on existing market or societal structures for the following reasons:

- ‘Institutional barriers’ are the hardest to overcome. Apart from organizational and knowledge barriers, it is the rigidity of laws and regulations (e.g. harbor permits and political fragmentation) and the resistance to change established practices of actors (producers, users, public authorities) which hamper the institutionalization of small wins against plastic pollution. These institutional restrictions restrain not only the demand for new solutions but also slow down the pace for new standards to remove the plastic in waterways.
- ‘Systemic propelling mechanisms’ do – in contrast to bottom-up mechanisms – not emerge naturally or are not strong enough to realize real impact. While first signs of coupling are observable (e.g. investments and collaboration along the value chain), robust and sustained change in current markets and societal practices cannot be observed yet. Particularly, coherent policies and regulations for plastic removal across governance levels appear to be essential, but missing to couple fragmented efforts and achieve robust change.
- ‘Reinforcement’ between bottom-up and systemic mechanisms is still weak. Despite a bottom-up push, evolving from energizing local actors and actions with enthusiasm and a ‘good cause’, and acceleration through several spillover and learning mechanisms, we do not observe strong interrelations with the systemic mechanisms of coupling and robustness to institutionalize small wins and achieve wider societal impact of newly emerging solutions. This can partially be explained by the fact that the initiatives we study started only recently; from 2012 onwards. Therefore, we cannot fully foresee the long-term effects. While, theoretically, alignments between bottom-up and systemic propelling mechanisms are expected to become stronger over time, such interrelations can currently only weakly be observed. As others have argued too, it can take time before distributed actions accumulate and accelerate, but once a small win has been accomplished, positive reinforcing effects are set in motion (Ferraro, Etzion, and Gehman 2015; Weick 1984). For initiatives that have been in place for longer, some reinforcing effects become visible already.

In [Figure 1](#) we illustrate the functioning, interaction, and mutual reinforcement of the propelling mechanisms based on our plastic pollution case. The interactions among bottom-up propelling mechanisms are present and observed (as indicated by solid arrows), while interaction with and mutual reinforcement of systemic mechanisms appeared weak or absent (indicated by dashed arrows).

We observe these patterns and interactions for the case of plastic pollution and the study of bottom-up initiatives addressing this particular problem area in the Netherlands. The findings that institutional barriers show the highest resistance, and that systemic propelling mechanisms are often too weak to ensure sustained growth, spatial diffusion and wider impact of new solutions, are likely to be of more general nature. However, more research also in other societal problem areas and geographical contexts would be necessary to better understand the functioning and interrelations between bottom-up and systemic propelling mechanisms. Issues of timing and system-wide accumulation, as addressed above, can materialize differently in other empirical contexts. Also, following the idea of incremental

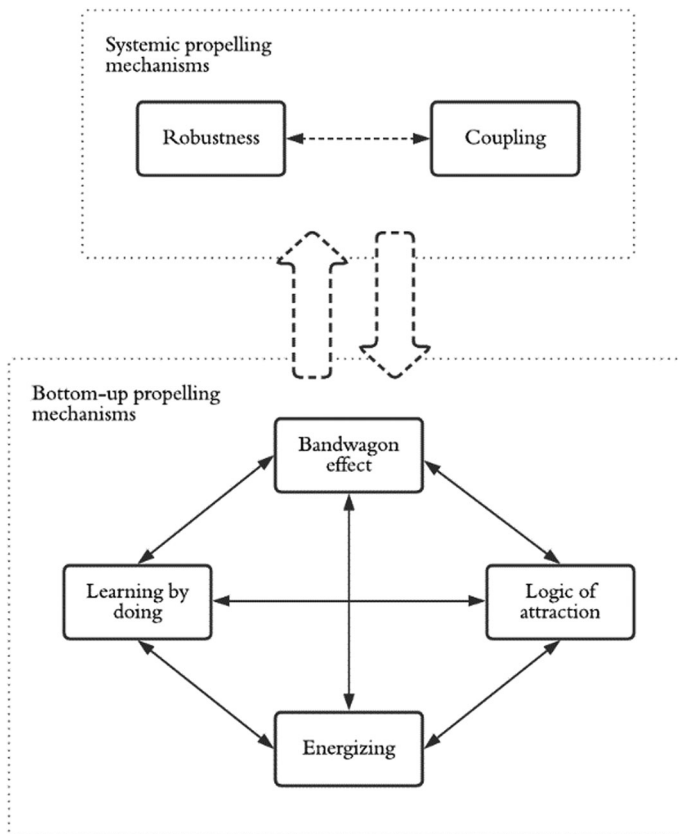


Figure 1. Bottom-up and systemic propelling mechanisms: interlinkages and reinforcement.

change processes, it would be necessary for future research to analyze the reinforcement of these mechanisms over space and time over a longer period.

6. Policy implications

Our research aim was to uncover the potential, opportunities, and challenges for regional innovation policy in pursuing a small wins governance approach for regional initiatives combating plastic pollution in the Dutch waterways. We identified three main barriers related to institutions, organizations and knowledge sharing. These barriers offer opportunities for regional innovation policy-makers to act on and provide stimulus for ongoing local actions where necessary. We see it as a role of policy to focus on aspects not pursued by others or not emerging naturally, and to find targeted intervention strategies. Therefore, when employing small wins as a governance strategy, it is essential first to assess the empirical dynamics and context, then the barriers that may constrain growth, and finally the already present (or missing) mechanisms to address those.

Our study illustrates how the small wins approach can serve as a governance strategy for regional innovation policy directed towards societal challenges. There are several implications for a regional policy that target transformative change in the context of

societal challenges. For innovation policy aiming at the wicked problems related to sustainability, health care or education, there is neither a ready-made catalogue of policy targets or interventions, nor can the impact of a single measure be attributed, isolated or directly measured against its aims. Instead, a more gradualist approach to system innovation requires a shift in mindsets and input- or output-oriented evaluation cultures of innovation policy-makers to justify or monitor their interventions.

Governing small wins for societal challenges requires a more adaptive policy characterized by continuous learning about what is or could be needed in a changing environment (Gunderson and Light 2006; Termeer, Dewulf, and Biesbroek 2017). Such an adaptive approach involves learning to recognize and gain knowledge about the plurality of bottom-up change efforts (in technology, institutions and social practices) and their potential to connect and accumulate. It would also involve learning to evaluate the interplay of these, with mapping tools and indicators that can on the one hand assess incremental progress and (societal) impact towards a joint vision, and on the other hand, detect different barriers coming up 'along the way'. Here, our empirical analysis of problem context, barriers and the (dis)functioning of propelling mechanisms for plastic pollution can serve both as an example and as inspiration for policy-makers. Policy, then, can start from inquiring the context, barriers and mechanisms before entering a dialogue with stakeholders what support measures and changes are desirable. Repeating this inquiry would further allow for an adaptive policy approach to react to changing conditions and look for learnings and couplings across initiatives, rather than to support very specific solutions selectively.

In the context of regional innovation policy, a small wins approach sets itself apart from current regional policy approaches in several respects: with the emphasis on small initiatives started by heterogeneous actors on the ground, it differs from the more science- and technology-oriented policies that tend to privilege universities or firms in established industries as the main stakeholders of regional innovation policies (Hassink and Gong 2019). Often, regions have substantial opportunities to regulate areas of social concerns closer to citizens, such as in housing, energy or transport (Coenen and Morgan 2020). Thus, regional innovation policies may be more effective in dealing with societal challenges if they focus on leveraging the plurality of innovation actors and processes, and the mechanisms supporting expansion and coupling across domains and scales. For instance, regulatory experiments may mobilize institutional or societal innovation at the local level, and help understand interactions between new regulation, technology, and social behavior. Also, opening up typically supply- or industry-oriented innovation platforms can help couple various thematically aligned initiatives and partnerships across firms, public actors, and civil society.

Moreover, small wins' change processes are gradual but non-linear (Termeer and Metzger 2019). A small wins governance approach thus questions the 'cockpit-ism' view underlying traditional policy planning (Hajer et al. 2015). In a regional context, this view is consistent with the idea that globally applicable problem definitions and solutions negate the wicked nature of societal challenges (Wanzenböck and Frenken 2020). In line with more experimental governance approaches (Sabel and Zeitlin 2012), the implementation of place-based policies requires practice-based learning (e.g. about local small wins, their needs and difficulties with existing structures and practices) and more flexible policy arrangements across regions (Morgan 2018). While contextual knowledge

can be gained decentralized, challenge-based coalitions and partnerships at higher governance levels can provide the coordination structures necessary for cross-regional learning and joint problem-solving in the context of grand challenges. Following our findings, the role of regional innovation policy seems to lie primarily in fostering systematic propelling mechanisms. As actors involved may have limited incentives and resources to diffuse their solutions beyond their local contexts, regional policy can also focus on diffusing promising solutions, coupling initiatives and creating conditions for upscaling already in an earlier stage. This would require policy-makers not only to be knowledgeable about successful local initiatives, but also to participate in multi-level governance arrangements that can facilitate the spread of local innovations and contribute to coherent policies across scales.

Suggesting a small wins strategy as a basis for regional innovation policy begs the question how such an approach matches with mission-oriented innovation policies currently implemented at national or supranational levels (Janssen et al. 2021; Larrue 2021). While a small wins approach starts from the bottom-up initiatives that are ongoing, mission-oriented innovation policy is generally initiated as a ‘top-down’ directional strategy or umbrella for various policy instruments targeted at specific goals. The two policy approaches clearly have ‘directionality’ towards societal aims in common, as well as an open eye to combining technological and non-technological solutions (Hekkert et al. 2020; Wanzenböck et al. 2020). Mission policies can thus complement small wins approaches to legitimate, mobilize and strengthen local initiatives in line with their goals. As illustrated by our case study findings, (trans-)national missions could also be used to create supportive conditions, for instance through reforming regulatory institutions (e.g. permits, taxes, standards, bans) at national or European level. However, this would require a mission-oriented innovation policy to focus also on institutional barriers and the interplay of governance levels to avoid inconsistencies in the policy mix of support structures and regulations. Here, more focus on multi-scalar arrangements designed to bridge the gap between emerging bottom-up practices and (trans-)national mission policies can help to scale up small wins solutions to diffuse beyond their local contexts.

Note

1. Keywords: ‘plastic AND waterways’, ‘plastic free waterways (Netherlands)’, ‘plastic free waterways public’, ‘plastic free waterways companies’, ‘plastic free waterways civil society’ and ‘municipality plastic initiative’.


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Appendices

Appendix 1: Interviewees

Table A1. Interviewee information.

Category	Number	Interviewee role
Technical	T1	International Relations
	T2	COO
	T3	Business Development Manager
	T4	Senior Advisor
	T5	Director
	T6	Branch Manager
Societal	S1	Treasurer
	S2	Project Manager
	S3	Innovation Manager
Networking & Supporting	N1	Advisor
	N2	Project Lead
	N3	Senior Advisor
	N4	Senior Consultant
	N5	Harbor master
	N6	Project Manager
	N7	Start-up coach
	N8	Community Director

Appendix 2: results example evidence

Table A2. Identified barriers substantiated by example evidence.

Type of barrier	Characteristics	Example evidence
Institutional barriers	Rigid institutions	<p>"It is not the case that the Netherlands does not want to clean, but the problem lies more in the use of new and young technologies. The Netherlands is not so keen on implementing innovations." (T2)</p> <p>"The fragmented character of the Netherlands is an issue. Every region has its own decision-making procedures, ambitions, targets and priorities that they want to adhere to." (T4)</p> <p>"Municipalities were unwilling to change their current practices and not open for adjustments." (N1)</p>
	Rigid regulations	<p>"In the Netherlands, as in most European areas, you need to possess permits to work in harbors. In the harbors of Rotterdam that is an issue, because there are very large ships, so it becomes difficult to sail." (T2)</p> <p>"The idea is simple, but the execution is not. Those floating systems are not applicable everywhere and require permits before they can be implemented." (S3)</p> <p>"The most important and critical criteria for us is to warrant safety of shipping when we decide whether we want to collaborate with new technologies or not." (N6)</p>
Organizational barriers	Intra-organizational resistance to change	<p>"Municipalities continue to collect waste in the ways they have always done, without using the new regulation. [...] Maybe it is because they are not aware, even though we did inform them." (T1)</p> <p>"We aim to convey cultural changes over the whole organization and create support for new technologies. We do so by keeping the involvement as close as possible and in specific using demonstrations, where employees can drive around on new equipment and others explain to them what it is and how it works." (T6)</p>
	Frictions in inter-organizational partnerships	<p>"Large companies find it interesting, but they are unsure what to do with it. Collaborations are done as a form of charity work. [...] He needs a boat to collect it, we have them in abundance." (T5)</p> <p>"Large corporations are against deposit on small bottles and form a fierce opponent. The largest companies have the most power." (S1)</p> <p>"We got involved to do a joint clean-up. [...] On that day we financed the personnel costs for them." (S2)</p> <p>"What can be seen is that smaller initiatives search for connections with larger companies, for investments in material for example [...] you need funding to develop a first prototype or full-scale technology." (N4)</p>
Knowledge barriers	Resistance to share knowledge and information	<p>"We are part of the community and are one of the few initiatives with a catching system. Other parties kept their cards close to their chests and were not willing to share their developments." (T3)</p> <p>"It can be a smart trick to deviate yourself from your competitors by not sharing information. [...] If someone comes with an idea and another one imitates it, you can collaborate, but you are also competitors." (T4)</p> <p>"That is something we constantly face in the community. Precondition to participation is to share knowledge, but for some that is their business case." (N6)</p>
	Differences in problem perception and urgency to act	<p>"In every community there are active volunteers, but the communication between municipality and the volunteers is insufficient. That is why we aim to bring those two together." (S1)</p> <p>"Not everyone made the effort to put the litter on the agreed areas so that it could be picked up. Some farmers found it easier to throw their trash back into the Meuse." (N2)</p>

Table A3. Bottom-up propelling mechanisms substantiated by example evidence.

Propelling mechanisms	Stimulating factors and dynamics	Example evidence	
Energizing	Inspiration	<p>"Our technology is no rocket science. It is not complicated, and everyone can easily replicate it. It shows that it is possible to do something that we are doing." (T4)</p> <p>"A boat builder picked up on our idea and he now develops fast-moving vessels out of the same plastic." (T5)</p> <p>"Luckily Rijkswaterstaat and the municipality took over our role. Our organization decided to draw back and pass on the responsibilities to other parties." (N6)</p>	
	A good cause	<p>"It was nice for us to start working on this, because you work for a good cause and a better, more sustainable future." (T5)</p> <p>"We share their story because everyone was energetic and happy that we decided to join the clean-up." (S2)</p> <p>"It is a form of positive framing when organizations work together with large actions for good causes." (N4)</p>	
	Continuous aspiration	<p>"We developed the waste catcher based on an idea from a dredging machine. After we noticed that wind plays a factors on currents, we looked at ways to make a floating system to put on the water." (T3)</p> <p>"The day after I came up with the idea, I went to some colleagues and pitched the idea. [...] After that I needed to make some more people enthusiastic about the idea within the company, which allowed me to work on it for some hours with budget." (T4)</p> <p>"The province is very interested. So, we started a pilot with three municipalities, where we monitor the litter." (S1)</p>	
	Learning by doing	Technological learning	<p>"Feedback from previous experiments was used to develop new systems and eventually also systems were proven of their technology." (T4)</p> <p>"In the current pilot that we execute [...], we make sure that the basic needs are fulfilled. That is the function of the pilot." (N1) "In Limburg we did the first trials to find out what works and what can be improved before we scaled it up to all large rivers in the Netherlands." (N2)</p>
		Organizational learning	<p>"Organizationally, we grew very fast last year [...] we had to adjust ourselves, growing from 3 employees to 8 people, especially the management." (T1)</p> <p>"After we produced our first products, we had to hire two people. Our previous business developer was not really suited for the role anymore. Within a small organization, everyone tries their best, but not everyone has the knowledge and expertise to do it. That is difficult." (T2)</p>
		Acquire additional resources	<p>"Subsidies from for example RVO contributed for a large part to the growth of our initiatives to other countries." (T2)</p> <p>"When you are collaborating with a foundation who does not have money, the people come to us as large companies to lend out boats and people to check out locations on rivers to implement the plastic waste catcher." (T5)</p>
Logic of attraction	Acknowledgement by influential actors	<p>"There are many competitions from the European Commission and other multinationals that have an impact fund, which they can donate to foundations like us. That creates impact for us, because we are acknowledged by those organizations." (T1)</p> <p>"WWF is one of our sponsors in England. Additionally, the International Monetary Fund writes about us." (T2)</p> <p>"The most important drivers were the fact that we received subsidy from the municipality and that the public attention has grown over the past five years." (T5)</p> <p>"The Ocean Cleanup possesses a lot of media power. [...] After their latest reveal of the Interceptor, we observed instant traction." (T5)</p>	
	Positive evaluation	<p>"When we opened up our recycled platform from river plastics, this generated a lot of media attention and was a moment of acknowledgement from the public." (T1)</p>	

(Continued)

Table A3. Continued.

Propelling mechanisms	Stimulating factors and dynamics	Example evidence
Bandwagon effect	Market forces	<p>"Last year our company was nominated for a very large award in Dubai." (T2)</p> <p>"Because we showed our results in the previous project, we were asked for a follow-up project as well." (T4)</p> <p>"In 2020 we will host a tender procedure, that companies can subscribe to [...]. The pilot associated with this tender aims to monitor how much waste is caught." (N4)</p>
	Copying designs	<p>"The market will prove what works and what does not, so that is the phase we are currently in." (N4)</p> <p>"Lately there are more initiatives that try to catch plastic from rivers, but I do not know if they copied us. [...] It is hard to tell if they are competitors or not, because they do the same job, but that is positive as well, since that is what we want: to tackle the plastic problem." (T1)</p> <p>"We have gotten a lot of competition. One from Dubai, who tried to copy us, but I don't think that went well, as he applied for a job with us this year." (T2)</p>
	Set an example for others	<p>"We aim to focus on awareness and education with lectures, because we believe next to the short-term solution, we also need to focus on long term effects." (T1)</p> <p>"We focus on contributing to something small that is positive to inspire others to do the same." (T5)</p> <p>"We hope to be a signal to the outside world that this problem is so structural. Requiring lots of efforts and money, which we have to collaborate to prevent it with a source-oriented approach." (N3)</p>
	Community feeling	<p>"The collaboration is there to combine our forces, because we can help one another." (T1)</p> <p>"The CoPP that was founded different parties get involved, some kind of Golden Goose." (T4)</p> <p>"The Community of Practice Plastic is a real Golden Goose that gets bigger and bigger. Everyone that does something with plastic attaches itself." (N6)</p>

Table A4. Systemic propelling mechanisms substantiated by example evidence.

Propelling mechanisms	Stimulating factors and dynamics	Example evidence
Coupling	Connection across scale (geographical and organizational)	<p>"We create a positive image by collaborating with this small initiative." (T5)</p> <p>"We managed to do it in the Netherlands, so now it is time to do something internationally, because there is still much to gain. Therefore, we got involved in this international project." (N3)</p> <p>"What can be seen is that smaller initiatives search for connections with larger companies, for investments in material for example [...] you need funding to develop a first prototype or full-scale technology." (N4)</p>
	Shared challenge	<p>"Everything that is present in the river and the harbor is a shared challenge for public and private actors, and citizens. For all areas within the dikes you are dealing with regional water authorities, where the same problems play a role. The difference is that there the waste does not flow towards the sea, but it accumulates in front of pumps." (N4)</p> <p>"Within the community there are a lot of shared goals. We all want to know what kind of plastics are in the river, where we can best collect is and how to do this, but there are different stakes involved." (N8)</p>
Robustness	(Difficulty to) Go beyond premature state	<p>"Part of our production will hopefully go to India to get the cost price of the product down. This will allow us to scale faster, provide a cheaper product, which will make it more attractive for organizations to maybe even buy our product." (T2)</p> <p>"It will be a lot of work to let the wins that are there have a chance to grow. [...] Those need a couple of years to create enough traction and budgets to do something." (T3)</p> <p>"Because there was a similar design, we had two choices; start heavy investments or decide not to form a blockade for the other. That is why we decided to put the project on hold." (T4)</p>
	(Absence of) Coherent national and European regulations	<p>"It is concerned with the responsibility. In the national Marine Strategy Framework Directive, it is noted that plastic is an unwanted material in the marine environment, but the Strategy for water, which involves sweet water streams, does not include anything on plastic yet. If it is not noted down on paper, nobody has to respond." (S3)</p> <p>"There are only a few systems that are implemented permanently, because it is about management, maintenance, costs and regulations. In Europe and globally there is no regulation on plastics in water yet." (N8)</p>