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Adaptive planning: Generating conditions for urban adaptability. Lessons from Dutch organic development strategies

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epb.sagepub.com**Ward Rauws and Gert De Roo**

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Abstract

The development of cities includes a wide variety of uncertainties which challenge spatial planners and decision makers. In response, planning approaches which move away from the ambition to achieve predefined outcomes are being explored in the literature. One of them is an adaptive approach to planning. In this paper, we argue that adaptive planning comes with a shift in focus. Instead of content and process, it is first of all about creating conditions for development which support a city's capacity to respond to changing circumstances. We explore what these conditions may comprise and how they can be related to planning. First theoretically, by portraying cities as complex adaptive systems. Then empirically, through an evaluation of the practice of organic development strategies in which development trajectories are only minimally structured. Based on a review of 12 Dutch urban development projects, two of which are analysed in detail in this paper, we identify a series of conditions on spatio-functional configurations and the capacity building of local actors which enhance urban adaptability.

Keywords

Uncertainty, urban planning, flexibility, responsiveness, self-organization

Introduction

The challenges that spatial planners face in guiding the development trajectories of cities in conditions of uncertainty are increasingly acknowledged in the planning literature (e.g. Albrechts, 2010; Bertolini, 2010; De Roo and Rauws, 2012; Salet et al., 2013; Van Woerkum et al., 2011). In response, both planning scholars and planning practitioners have started to search for planning approaches which are able to coevolve with the dynamics in cities and make cities more responsive to dealing with uncertainties

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(e.g. Ahern, 2011; Albrechts, 2013; Bergevoet and Van Tuijl, 2016; Hillier, 2007). One of them is an adaptive approach to planning. Central to this approach is that it does not aim to establish one particular future configuration – thus assuming that the precise predictions of an urban development trajectory can be understood and defined – but instead aims to support a range of possible future configurations based on conditions for development (see also Hartman, 2016; Wilkinson, 2012; Yamu et al., 2015). These conditions for development generate ‘possibility spaces’ within which urban structures can take shape and development processes can unfold.

In this paper, we explore how more traditional, control-oriented planning systems like the Dutch one can open up to such an adaptive approach to planning. We do so by evaluating organic development strategy (ODS) practices. These are a recent and radical alternative to the dominant Dutch planning practice (Buitelaar et al., 2014; Urhahn Urban Design, 2010) which we will argue are closely related to the idea of adaptive planning. We aim to answer three questions:

- Which conditions for development strengthen the adaptive capacity of cities?
- How can these conditions be influenced or generated by planning?
- Which dilemmas for public planners are exposed when critically analysing an adaptive planning approach?

In answering these questions, we will start by exploring a complexity science perspective on cities (Batty, 2013; Portugali et al., 2012). This perspective invites us to understand cities as open systems which evolve through a changeable and interrelated mix of processes (Portugali, 2006). These processes include foreseen and unforeseen triggers for change at a global level, such as rising sea-levels and economic crises, and formal and informal responses at the local level, such as policy shifts and citizens’ initiatives. As such, a complexity perspective on cities moves beyond the idea that urban change processes can be reduced to direct causal relationships between system elements which can be understood independently of time. Instead, transformations are assumed to evolve at variable speed and impact, and originate from unstable urban configurations. This means that cities are considered to be constantly in a process of becoming, with uncertainties an intrinsic part of their development trajectories. Within complexity science this mutability of systems is not problematized, as something to be reduced or avoided. Indeed, it is this very same mutability which provides systems with the capacity to ‘survive’ and adapt to volatile contexts. For this reason, a complexity science perspective on cities can help in identifying conditions which enable or constrain urban adaptability.

Our next step is to analyse how these conditions can be related to spatial planning. For this, we will evaluate ODSs by analysing two cases out of a review of 12 Dutch organic area development projects (see ODSs: facilitating and guiding local initiators in producing urban change section). The Netherlands, once described as a planner’s paradise (Faludi and Van de Valk, 1994), has a strong tradition of blueprint planning as well as more communicative practices, supported by a well-developed planning system and detailed planning procedures and regulations to guide urban developments towards agreed outcomes (Gerrits et al., 2012). ODSs contrast these planning methods as they allow a variety of possible future spatio-functional configurations to emerge over time and by opening up development processes for non-professional project initiators. ODSs are based on an open urban programme combined with a series of conditions which new project initiatives have to meet, such as land-use type ratios, restrictions on nuisance or minimum energy standards. Within certain limits, they therefore bring greater flexibility to the control-oriented Dutch planning practices.

Evaluating these practices provides insights into how planning strategies can create enabling conditions for adaptive urban environments. From a complexity science perspective, ODSs are viewed as attempts to open up urban development trajectories for more 'spontaneous' and less controlled routes of development. Reviewing the planning rules and the development process in ODS practices can reveal how planners can support cities to welcome more diverse urban fabrics and increase their possibilities for incorporating expected and unexpected changes during urban transformations.

Moreover, it enables us to identify the dilemmas for public planners when aiming to enhance the adaptive capacity of cities (compare Savini et al., 2015). For instance, how to serve collective, societal goals while increasing flexibility? How to open up development practices for new coalitions and initiatives, while promoting coherent and inclusive cities? How to enhance responsiveness to unexpected change in the long term while seizing short-term opportunities? By discussing these questions in the context of ODS practices, we expose the dilemmas related to an adaptive approach to planning, as well as possible ways for public planners to deal with these dilemmas.

This paper is structured as follows. We start by further unpacking the notion of adaptive planning. Then, we examine which conditions can enable and disrupt an urban area's adaptive capacity by portraying cities as Complex Adaptive Systems. This provides an analytical framework for reviewing ODS practices in the the second half of this paper after which we conclude the paper.

Making sense of adaptive planning through a complexity lens

As early as the 1960s and 1970s, scholars such as McLoughlin (1969) and Rittel and Webber (1973) were already emphasizing the limitations of comprehensive bounded rationality in dealing with complex public policy and planning issues. They argued that often planners and policymakers do not really deal with 'tamed problems', issues which are clearly definable and separable, but with 'wicked problems', situations which are inherently fuzzy, fluid and uncertain and therefore impossible to comprehend fully. Their work is again being embraced in recent studies on complexity and planning as several scholars have found inspiration in complexity science for exploring alternative planning approaches to deal with 'wicked problems' (e.g. De Roo and Rauws, 2012; Gerrits, 2008; Innes and Booher, 2010; Portugali, 2011). To further unpack the notion of adaptive planning, we draw upon this complexity science perspective.

Complexity science challenges planners to rethink the nature of uncertainties and to develop what we argue is a situational understanding of urban development trajectories, taking into account the uniqueness of an urban configuration in time and space. This is because, from a complexity perspective, phenomena are considered to develop non-linearly, meaning that changes can occur unexpectedly and can have a disproportionate effect over time and space (Heylighen et al., 2006). This also implies that the effects of a traditional planning intervention, which tries to direct the evolution of urban developments towards a predetermined future configuration, come with uncertainties, resulting in a gap between the desired, the intended and the actual results.

A complexity science perspective on cities invites planners to develop an alternative way of guiding urban transformations. From this perspective, enhancing the capacity of cities to maintain an optimal 'fit' with their dynamic environment should be the focus of planning, rather than trying to establish a particular urban configuration. Taking a complexity lens, cities are assumed to be embedded in a multilayered landscape in which various sub and supra-systems coevolve in response to changes (Liljenström and Svedin, 2005). When these

changes, arising suddenly or gradual, expected or unexpected, lead to a mismatch between the city and its context, this will mostly probably trigger a transition process through which the city adapts to its new context. If not, the city will get drawn into a lock-in situation, losing its connections with and relevance to its environment, and ultimately declining (see Hassink, 2005). Transitions towards a new relatively stable 'fit' are likely to include qualitative alterations as well as quantitative ones, including a change in both a city's structure and function (De Roo, 2012; Yamu et al., 2015). We are reminded of cities which undergo a transition from being centres of industrial production to central nodes in the financial and wider services economy, or to being places for leisure, tourism and experience. Due to the fundamental changes transitions inhibit, supporting the future vitality of cities is not helped as much by planning strategies which primarily focus on content (what spatio-functional configuration should be planned for) or process (whom to involve and reach consensus with on a particular future development path) After all, what will turn out to be the best possible urban configuration and the most effective and legitimate actor-coalition is hard to predict.

Therefore, we argue that an adaptive approach to planning first requires a focus on the conditions under which urban developments can unfold. These conditions are end-state independent and are concerned with strengthening the capacity of a city undergoing transitions and building towards new vital configurations, while remaining a liveable and robust system over time. This proposal connects to the work of Alfasi and Portugali (2007), Holcombe (2013), Andersson (2014) and Moroni (2015) in which more generic frameworks for development based on urban codes is suggested, but differs in two respects. The codes these authors introduce concern, among other points, 'the relation between element of the built environment' (Alfasi and Portugali, 2007: 169), refer to general types of situations and should merely 'prohibit certain externalities rather than particular activities at certain locations' (Moroni, 2015: 10). While the conditions for development we refer to also include principles to guide emerging spatio-functional configurations, they are not limited to such principles. They are also concerned with building the capacity of local actors, as we believe their capacity to start initiatives can also have a substantial impact on urban adaptability. These conditions include, for example, measures that foster information exchange or increase connectivity between actors.

A second difference is that we do not follow authors such as Holcombe (2013) and Andersson (2014) in considering condition-based planning strategies as an opportunity to establish a more liberal, private enterprise-led planning system. We believe governments do have an active role in pursuing collective, societal ambitions, and encouraging socially preferred directions of development. This brings us to the question of how purposefully influencing the direction of development trajectories relates to adaptive planning.

Various aspects are emphasized in the debate on adaptive planning. Some scholars emphasize the need for incremental strategies and learning by doing, linking in with Lindbloms' 'muddling through' (e.g. Alfasi and Portugali, 2004; Kato and Ahern, 2008). Others start from a socioecological perspective and refer to adaptability as the capacity of a system to remain stable by adjusting to internal dynamics and external changes (Folke et al., 2010). While these aspects are important elements of an adaptive approach to planning, we argue that such an approach also includes a normative dimension. In other words, adaptive planning is more than supporting the self-reliance of urban systems in which urban development results in some kind of social Darwinism (see also Davoudi, 2012). Generating conditions for urban adaptability cannot and should not be done in isolation from societal values, norms and agreements (including political agreements), for example, concerning deprived neighbourhoods or vulnerable ecological assets. The desire to create a

better future – one which is, for instance, believed to deliver more liveable and attractive cities – cannot be ignored either. This means that generating conditions for development is not only about fostering urban adaptability but also includes making preferred development directions more likely to emerge.

To conclude, our proposal for an adaptive planning approach includes two steps: (1) creating conditions for development with regard to future spatio-functional configurations and building the capacity of local actors who strengthen urban adaptability; and (2) tweaking these conditions to the extent that in the course of an area's development, socially preferred trajectories become more likely to emerge and those which are considered to be problematic are avoided as much as possible. The dynamic 'real' is thus linked with the desired 'ideal' (Batty, 2013). Tweaking conditions in the spirit of the latter should of course be motivated by democratic decision-making.

Deriving conditions for urban adaptability by portraying cities as complex adaptive systems

In this section, we will analyse which conditions for development should be part of an adaptive planning approach. By casting cities as Complex Adaptive Systems (CAS) and relating the properties which allow CAS to maintain a 'fit' with their dynamic environment to urban systems, we identify which conditions enable or disrupt urban adaptability. We distinguish four properties: although each has a different emphasis, the conditions derived can partly overlap. These conditions are discussed on the basis of the literature on dealing with uncertainties and non-linear dynamics in social and socio-spatial systems. We present the system property first, followed by the derived conditions which we suggest should be generated by planners and other stakeholders (i.e. local initiators). The CAS properties are

(1) Non-linear development trajectories

A CAS perspective on cities considers urban development to progress non-linearly, resulting in development trajectories which vary in speed and scope over time. As well as a varying degree of uncertainty, this also means new system configurations can arise relatively quickly. Urban transformations can include sudden notable shifts, such as an inflow of migrants which dramatically shifts the social composition and functioning of an urban district (Alba et al., 2000), or of less visible but nevertheless fundamental shifts, for example, the way that the use of social media transforms our use of public space (Drucker and Gumpert, 2012).

- *Disruptive conditions:* when the uncertainties which come with non-linear change are solely regarded as risks of failure, this is likely to frustrate the system's adaptability (Holling, 1978). This means that stakeholders can become paralysed and no longer be willing to take action or make investments (Beck, 1994). When considering public planning authorities in particular, this can limit their capacity to improvise, innovate and be creative, as they will lack the confidence to operate proactively (Gunn and Hillier, 2014).
- *Enabling conditions:* non-linear development trajectories challenge planners and other stakeholders to embrace uncertainty as a core component of urban development (De Roo, 2012). They require planners, for example, to create institutional arrangements and spatial designs which support various future configurations while guaranteeing basic rights (Rauws et al., 2014; Moroni, 2015).

(2) Responsive to the dynamic environment

CAS theories portray cities as open systems which are sensitive to changing circumstances and therefore need to adapt to maintain their functionality. The attention being paid to climate-proof cities to cope with the increase in extreme weather conditions or rising sea levels is an example of responsiveness to changing circumstances (Brown, 2012).

- *Disruptive conditions:* lock-in situations in which an urban system has a high level of specialization and expresses an increasing functional, cognitive and political rigidity, should be avoided (Martin and Sunley, 2007; Hartman and De Roo, 2013). Meanwhile, too much diversity in an urban configuration can also have a disruptive effect, resulting for example in a high level of fragmentation, missed opportunities for synergies between developments and inefficient use of resources (Duit, 2012, 2010; Folke et al., 2005).
- *Enabling conditions:* responsive urban systems require an enhanced manoeuvrability which builds on the system's distinctive qualities compared to neighbouring systems (Hartman et al., 2011). This means planners are advised to coordinate the active exploration of likely alternative development trajectories. Flexible project boundaries, experiments and trend-watching can help such exploration (Gerrits and Teisman, 2012; Rauws and De Roo, 2011; Rotmans et al., 2012). Also the awareness of other stakeholders of an area's distinctive characteristics and how they can use these characteristics to connect to potential future states has to be strengthened (Boelens, 2009; Hartman et al., 2011). Planners can support this process by combining inspiring visioning with a pragmatic development approach when it comes to exploiting unexpected or planned opportunities (Rauws et al., 2014).

(3) Self-organization

According to CAS theories, self-organization is a key property through which systems self-innovate and self-stabilize in response to changing circumstances. In the context of cities, this includes the rise of new structures, patterns and organizations within an urban system, as a result of interaction between actors and without external coordination. Examples of self-organization processes can be found in urban land transformation (Webster and Lai, 2003), traffic flows (Chowdhury and Schadschneider, 1999) and informal settlements (Silva and Farrall, 2016).

- *Disruptive conditions:* the self-organizing capacity of systems is frustrated when its actors' efforts to deploy activities, establish relationships and take decisions which contribute to the emergence of internal organization are suppressed (Prokopenko, 2008). This occurs for example when planning authorities have predefined the scope and the timeframe within which citizen involvement in urban projects is accepted too tightly (Boonstra and Boelens, 2011; Sagaris, 2013), or present a 'supposedly objective design syntax' which undermines the generative capacity of other stakeholders (Van Assche et al., 2013: 191).
- *Enabling conditions:* self-organization in urban systems is helped by settings in which local initiators can easily establish collaborations according to their own motivations and interests, and start projects of a manageable size for non-professional planners (Boonstra and Boelens, 2011; Sagaris, 2013). Planners can encourage this in at least three ways: (1) by creating fora for interaction and mobilizing creative minds, strategists and visionaries (Rotmans et al., 2012; Van Buuren et al., 2012),

(2) by devising institutional frameworks and spatial designs that support small-scale projects (Alfasi and Portugali, 2004) and (3) by considering citizens as co-creators of the city who should be able to understand and contribute to the rules and regulations which guide urban development (Alfasi and Portugali, 2007).

(4) Coevolution

A final property of CAS, which explains their continuous reconfiguration, is coevolution. It implies the mutual adaptation process between urban systems (and non-urban systems), including systems related both horizontally (e.g. other cities) and hierarchically (e.g. urban regions or neighbourhoods). Such coevolutionary processes may involve the spatial configuration of an urban area as well as its institutional arrangements. An example is the coevolution between sustainable energy initiatives and urban governance through which new trajectories for urban energy systems are established (Rydin et al., 2013).

- *Disrupting conditions:* urban coevolution is impeded by situations in which one system directs the development trajectories of other systems and subsystems while ignoring their feedback (Van Buuren et al., 2012). Grand designs contribute to such situations as they favour linear planning processes over cyclical ones, diminishing opportunities for mutual adaptation between urban systems.
- *Enabling conditions:* by designing spatial and institutional frameworks which allow incremental or modular development, planners increase the opportunities for mutual adaptation between systems (Gerrits and Teisman, 2012; Rotmans et al., 2012). Attention to systematic learning by both planning authorities and project initiators can support the successful inherence of those system characteristics which ensure that a system fits with changes in neighbouring systems and adjusting the characteristics which constrain this process (Atzema et al., 2009).

In this section, we have explored enabling and disruptive conditions for urban adaptability from a CAS perspective. To understand how planners can integrate these conditions in planning strategies and the dilemmas this brings for public planners, the next section includes an evaluation of ODS practices. As the above teaches us that enabling and disruptive conditions are often each other's antitheses, we will only focus on how to create enabling conditions.

ODSs: facilitating and guiding local initiators in producing urban change

ODSs emerged as a response to the dominant housing and real estate practice in the Netherlands since the Second World War (Buitelaar et al., 2014; Rauws, 2016). This practice is primarily supply-oriented and typically includes large-scale projects based on a serial, cost-efficient production of mono-functional, individual units (e.g. single-family homes, apartments). It is a strongly institutionalized practice as project developers and social housing corporations, along with municipalities, control both what will be built and by whom. The demands of the facilities' actual users are only considered to a limited extent (Blijie et al., 2009; Boelens and Visser, 2011; Bontje, 2003). As a result of the recent housing and real estate crisis and the re-emerging demand among contemporary Dutch citizens to take the lead in developing their everyday urban environment (Hajer, 2011), the downsides of traditional approaches are receiving increasing attention. Overly optimistic expectations

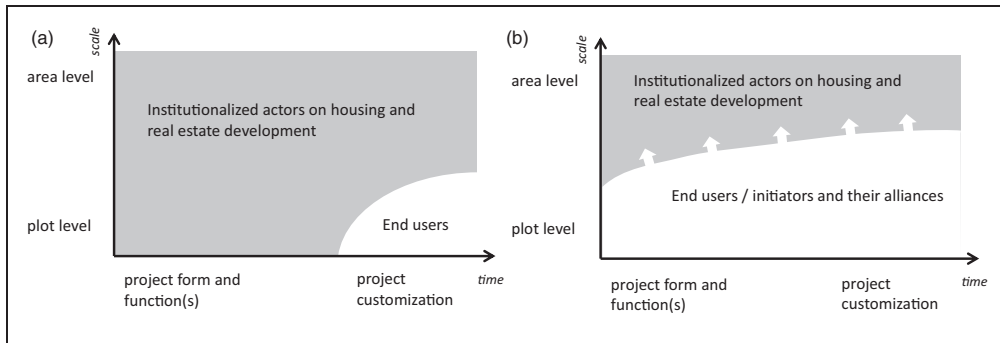


Figure 1. Organic development strategies are opening up traditional housing and real estate practices in the Netherlands: (a) Traditional area development and (b) Organic area development.

for land revenues combined with limited flexibility in urban programmes resulted in financial failures and/or an inability to meet this new demand (Janssen-Jansen et al., 2012; Rauws et al., 2014). ODSs are in this respect a radical and well-received alternative.

ODSs offer a flexible development path within certain boundaries. ODSs do not include a prescriptive blueprint of what should be where. Instead, there is an open urban programme for the development area in which a variety of housing and real estate projects can be realized. This variety is reflected in the process, scale and type of projects, which are typically referred to as ‘initiatives’. With respect to the development process, individuals or non-traditional coalitions of actors (e.g. alliances between architects, entrepreneurs and citizen collectives) are invited to start an initiative (Figure 1). This means that the future inhabitants and users of an area are often the first people responsible for designing the living environment, creating a demand-driven development process. ODSs also offer opportunities for initiators to realize ambitions on a scale larger than individual units (e.g. autarkic living communities or multi-generational cohousing projects). Finally, the type of functions that initiatives serve, and their location, are to a large extent left undefined, as is their development pace. This means that combinations of functions can be established which correspond to the lifestyles of individual or groups of initiators, sometimes by using the freedom of ODSs to ignore conditions which are commonly set by public authorities for ordinary housing and real estate developments. In sum, ODSs trigger a kind of self-organizing development process in which an area transforms through a series of diverse self-realized and self-managed initiatives which give rise to an urban mosaic at a higher level. This brings us to the fundamental difference between ODSs and traditional control-oriented urban development processes: ODSs generate open and flexible development trajectories which give rise to spontaneous patterns rather than predefined spatio-functional configurations.

In ODS practices, planners are concerned with generating conditions which support the emergence of self-managed initiatives and conditions which provide a degree of guidance for these initiatives. These conditions relate to potential future spatio-function configuration and to the building of capacity in local actors. We will explore the opportunities and dilemmas these practices expose for putting CAS-based conditions for urban adaptability into practice. The analysis builds on a research project which investigated various aspects of 12 areas in the Netherlands which are being developed using ODSs¹ (see Table 1). The investigation was based on a review of policy documents and interviews with project leaders, policymakers and advising consultants in the period 2009–2014. Below, we

Table 1. Urban development projects analyzed by the research team in the period 2009–2014.

Name (municipality)	Status	Size (ha)	Type of development
A12-zone (Utrecht)	Exploration	1150	Urban extension, mixed use
Amstel III (Amsterdam)	Under development	250	Redevelopment of an office park, mixed use
Coolhaveneiland (Rotterdam)	Under development	36	Revitalization of a neighbourhood, mixed use
Cruquiusgebied (Amsterdam)	Under development	17	Redevelopment of an inner-city harbour area, mixed use
Ebbingekwartier (Groningen)	Under development	9	Redevelopment of an inner-city industrial site, temporary mixed use
Havenkwartier (Assen)	Under development	125	Redevelopment of an inner-city harbour area, mixed use
Havenkwartier (Deventer)	Under development	15	Redevelopment of an inner-city harbour area, mixed use
Homeruskwartier (Almere)	Under development	106	New urban neighbourhood, mixed use
Oosterwold (Almere)	Under development	4300	New urban district, mixed use
Vinkenburg (Bunnik)	Exploration	120	Extension of a village, housing
Vossenpels (Nijmegen)	Under development	15	Redevelopment of a greenhouse area, mixed use
Winszen (Beuningen)	Exploration	Not defined	Extension of a village, housing

present two of the 12 cases. These projects were selected because they reflect the variety of developments to which ODSs are applied. The first case, Vossenpels in the city of Nijmegen, includes a small brownfield development with a mix of dwellings and greenhouses. The second case is a large greenfield development, Oosterwold, which is expected to become a new urban district of the city of Almere (see also Rauws, 2016).

Vossenpels (City of Nijmegen)

The Vossenpels case concerns the organic redevelopment of a hamlet north of the city of Nijmegen. The area is traditionally known for its horticulture, and a mix of dwellings and greenhouses shapes its urban fabric. The redevelopment started in 2012 and comprises 15 hectares (Figure 2). It is expected that 165–200 initiatives, mainly residential, will be realized there. The ambition is that the initiatives will be constructed in such a way that they can be adjusted and extended over time, to suit the initiators' changing demands (Gemeente Nijmegen, 2012). The construction land is owned by the municipality, excluding the plots of existing dwellings. A separate project organization, GEM Waalsprong, is responsible for assisting and guiding the initiatives. The organization, which is a cooperation between the municipality and two housing corporations, is also responsible for the site preparation and the construction of water, electricity and sewage infrastructure.

The development strategy for Vossenpels includes a series of conditions for the area's organic development. First, an open-ended development vision was created, stating that Vossenpels is an area which can be developed by individuals or collectives who wish to construct a house, workspace or something else and contributes, along with all the other initiatives, to the rise of a 'post-agricultural landscape' (GEM Waalsprong, 2011: 11). In this vision, seven 'habitats' are distinguished to attract a diversity of potential initiators

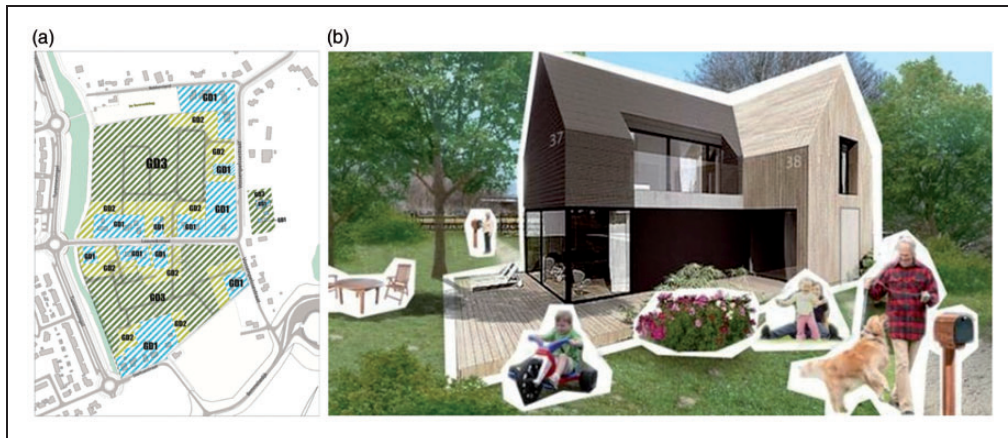


Figure 2. The global land use plan of Vossenpels (a) and an artist's impression of a possible project by private commissioning (b) (www.plantjevlag.nl).

to join in. The vision is supported by a general land-use plan in which plot sizes are left undefined, a construction time of 15 years is allowed and possible future extensions of buildings are anticipated. As such, the ODS for Vossenpels is not focused on controlling urban development towards a narrowly predefined future state. Instead, it invites local initiators to produce urban change by offering possibility spaces.

The development vision was established by an interactive process which was mainly aimed at inspiring and connecting potential initiators and stimulating their collaboration. It included a community visioning event and a digital platform for potential initiators to launch their ideas. A similar process, in which initiators are invited collectively to design and maintain public space, is currently ongoing. The development of Vossenpels is completely based on small-scale local initiatives, including privately commissioned housing, creative industries and cohousing initiatives. GEM Waalsprong offers initiators examples of best practices, step-by-step guides on how to complete the legal procedures, and help from professional urban designers. The project organization thus aims to inspire and facilitate citizens and entrepreneurs to develop an initiative in various ways.

In addition to the open and inviting development vision, planners also composed guiding rules. An important part of these rules is integrated in the land-use plan. This plan indicates that the existing physical patterns, such as the historically developed street layout, green areas and elongated shape of existing plots, must be respected. Next, the zoning allows for a mix of living space, offices, shops and food services, but prohibits other types of development in order to prevent too much competition with functions in adjacent urban areas. The plan also includes a maximum for the area available to non-housing functions in the development area and the ratio of built surface to the size of a plot. A maximum building height and a minimum distance between a building and the edge of the plot are meant to prevent negative outcomes.

Hence, the open development vision which invites citizens to realize an initiative according to their own preferences is guided by a comprehensive set of rules which bounds the flexibility of the Vossenpels development trajectory.

In addition to these restrictions, other guiding rules aim to encourage particular types of development. Social diversity is encouraged by supporting initiators with low and middle incomes. This is done by reserving plots, financial and organizational support and by providing a series of preselected, affordable designs which can be used as a basis for such

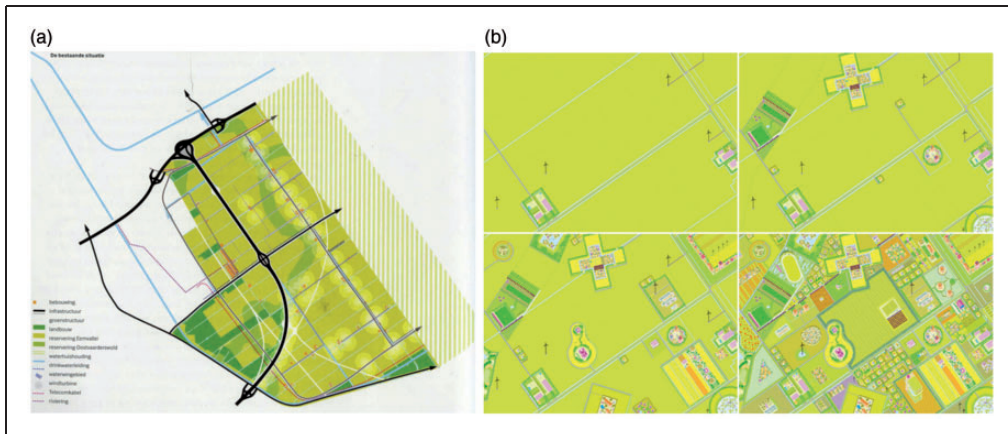


Figure 3. Overview of the Oosterwold development (a) area and an impression of how the area might develop organically over time (b) (RAAMM, 2012).

projects (GEM Waalsprong, 2014). Moreover, potential initiators themselves defined additional guiding rules for the ‘habitats’ which were distinguished during the community visioning process with the aim of harmonizing the designs of individual projects. These rules concern the aesthetics of the urban fabric (e.g. the building materials used and the fencing-off of plots) and are included in the plots’ purchase agreements. Both are examples of how societal ideals are integrated in the open development framework of an ODS, somewhat decreasing its flexibility.

To conclude, various conditions are created to guide the development of Vossenspels. These can be interpreted traditionally, as rules installed to enforce a particular development trajectory. However, in the context of the organic development aimed for in Vossenspels, they serve other goals: to encourage self-managed initiatives, to avoid conflict between these initiatives and to stimulate synergy and coherence in the area’s development trajectory, which is accepted as being as yet unknown. Taken together, these conditions could offer planners examples of how to enable urban adaptability, as will be discussed in the next section. First, however, we will introduce the second case.

Oosterwold (City of Almere)

The organic development of Oosterwold will add a new urban district to the east side of the city of Almere. The project area is much larger than that of ‘Vossenspels’: it covers 4300 hectares and is designed to include mixed-use (living, offices, farming and leisure) developments (Figure 3). The first initiatives were started in spring 2014 and if the area is fully developed it is expected that it will contain at least 15,000 dwellings and support 26,000 jobs (Gemeente Almere and Gemeente Zeewolde, 2012). The development of Oosterwold is the largest and most radical application of ODSs in the Netherlands so far. By Dutch standards, a relatively large number of responsibilities have been transferred to the local initiators. For example, they are expected to construct the access road to their plot, make the initiative partly self-supporting in terms of energy and wastewater treatment, and contribute to local food production. Half the land in the area is owned by Central Government Real Estate Agency (Rijkswaardebedrijf: RVOB). Profits earned from these plots will to a large extent be used for providing public facilities in the area and the city as a whole.

The development strategy generates various conditions for the organic development of Oosterwold. As with Vossenpels, a vision of an open development programme has been drafted. This vision is being translated into a structure plan and aims to inspire potential initiators to shape a low-density living and working environment in a countryside-like setting (Gemeente Almere and Gemeente Zeewolde, 2012). As no timeframe has been set for the development's completion, Oosterwold's development trajectory is open ended. Architectural regulations have been abandoned and different functions can be accommodated as long as they do not cause nuisance to neighbouring plots. This means that the ODS for Oosterwold leaves open a wider range of development trajectories than the ODS for Vossenpels. However, initiators do have to take into account the existing functions and reservations for the future development of infrastructure and nature areas.

Similar to Vossenpels, a specially founded organization, 'Maak Oosterwold', is facilitating the development of initiatives in various ways. Manuals and guidance for organizing the development process and completing legal planning procedures are also provided in Oosterwold. Moreover, an account manager has been appointed to connect initiators, including professional project developers, to the current landowners, to help them work out their ideas while taking into account the development vision, and to identify options for synergy between initiatives.

As well as facilitating these self-managed initiatives, planners also defined various guiding rules. At the very beginning of an initiative, the initiator agrees to abide by these rules by making an anterior agreement with the municipality.² When the initiative is fully developed and ready to be constructed, planners check whether it corresponds with the Environment Plan (*omgevingsplan*)³ in which the guiding rules are set out. One of these rules requires the initiative to be partly self-supporting in terms of energy and wastewater treatment and for the initiators to construct primary infrastructure themselves, or link into connections made by others. To make this possible, the edges of each plot have to be reserved for possible future network extensions (see Figure 4). A plot's size and shape can be chosen freely by initiators. Current initiatives vary between 0.25 and 5.5 hectares. Nevertheless, predefined ratios of urban land, farmland and a partly public nature areas have to be met. This ratio requires the inclusion of more nature or agricultural land in zones with existing green areas or historical landscape patterns. The floorspace to plot area ratio is also predefined, but higher densities are possible if compensated for by including more private or public green spaces or farming land. Finally, and similarly to Vossenpels, initiators from low and middle income groups can get various forms of support to develop their initiatives. As the project organization considers the development of Oosterwold to be an experimental process, the guiding rules are subject to critical evaluation. The account manager keeps track of the progress of individual initiatives and organizes meetings of experts to receive feedback and suggestions on how to deal with unforeseen initiatives. A full evaluation will be held in 2016, giving planners the opportunity to make adjustments to the guiding rules and adapt them to changing circumstances over time.

In sum, both the Oosterwold and Vossenpels cases show that in ODS, the function of plans and regulations and the role of planners are redefined to foster self-managed initiatives. Such initiatives collectively give rise to the transformation of an area without its future configuration being known. We can also see that compared to Vossenpels, Oosterwold offers a greater degree of flexibility in the possible development trajectories. This is as a result of the guiding rules in Oosterwold being mainly concerned with an initiative's contribution to the overall spatial character of the area, how it relates to neighbouring initiatives and how options for future development will be kept open. They concentrate

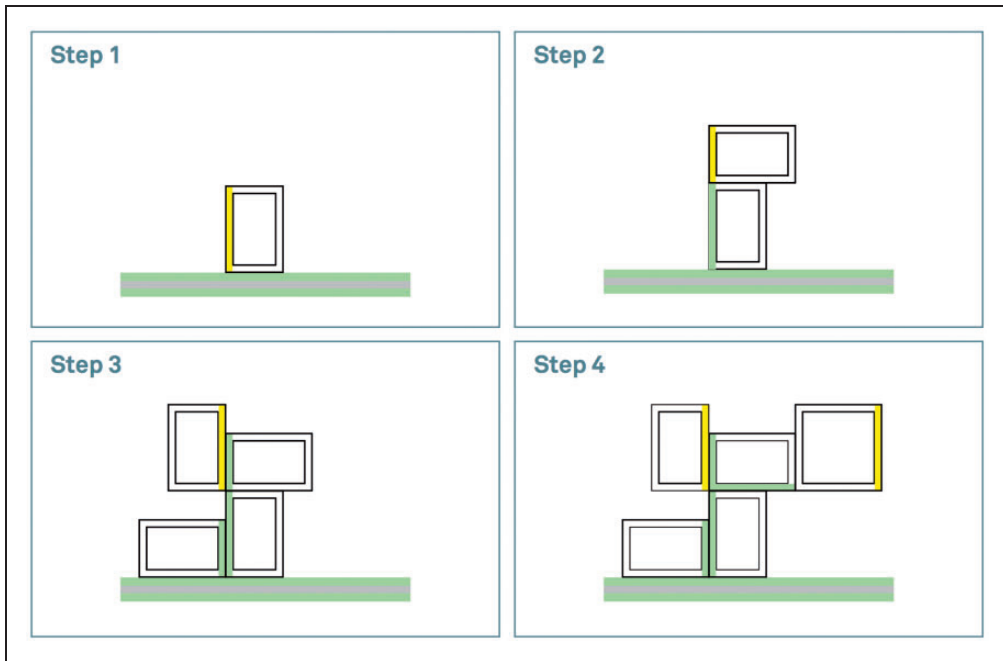


Figure 4. Step-by-step development of road, bike and water infrastructure. Land owners have to reserve the edge of their plot for possible future infrastructure and they each have to add a network extension on at least one side of the plot. This way the network grows in an organic way (Gemeente Almere & Gemeente Zeewolde, 2013 p.51).

on avoiding possible negative consequences, such as free-rider behaviour, blocking future development options and unwanted externalities, and securing a minimum level of spatial coherence and environmental quality. In the case of Vossenpels, the range of possible future configurations is more narrowly defined as more conditions on the individual projects are included. Our next step will be to evaluate the opportunities and dilemmas ODS practices expose in generating conditions for urban adaptability.

Lessons from ODSs for generating conditions for urban adaptability

In this section, we will evaluate how ODS elements can support planners in generating conditions for urban adaptability and which dilemmas they may face in doing so. This analysis is structured along the four CAS properties which are central to this paper: non-linear development trajectories, responsiveness to the dynamic environment, self-organization and coevolution. The analysis is summarized in Table 2.

Coping with non-linear development trajectories while promoting preferred outcomes

In both case studies, the idea of developing a predefined fixed urban configuration has been abandoned to a large extent. It is accepted that the uncertainties resulting from the relative freedom given to initiators and from market and societal trends generate urban development trajectories which progress at varying speeds and with unexpected twists. This acceptance is illustrated by the relatively open urban programmes and the loose or unrestricted timeframe

Table 2. The opportunities and dilemmas ODS practices reveal when evaluating them through a complexity lens (partly based on Rauws et al., 2014).

Properties of complex adaptive systems (CAS)	CAS-based conditions for urban adaptability	Opportunities for creating enabling conditions derived from cases	Resulting dilemmas for planners
<p><i>Non-linear dynamics</i></p> <ul style="list-style-type: none"> – cause-effect relations are disproportional, producing development trajectories that have a high degree of uncertainty 	<p><i>Disruptive</i></p> <ul style="list-style-type: none"> – portraying uncertainties solely as risks for failure <p><i>Enabling</i></p> <ul style="list-style-type: none"> – uncertainties are embraced as a core component of development – institutional arrangements and spatial designs that are flexible towards various development trajectories while securing basic rights 	<p><i>Coping with non-linear dynamics in ODS</i></p> <ul style="list-style-type: none"> – open-ended development trajectory – guiding rules 	<p>Enhancing urban adaptability <i>versus</i> promoting desired directions of future development.</p>
<p><i>Responsive to the environment</i></p> <ul style="list-style-type: none"> – systems adapt to their dynamic environment to maintain their functionality 	<p><i>Disruptive</i></p> <ul style="list-style-type: none"> – lock-in situations – too high degree of diversity <p><i>Enabling</i></p> <ul style="list-style-type: none"> – exploring likely development trajectories – experimentation – awareness of distinctive characteristics of the area – combining inspiring visioning with a pragmatic development approach 	<p><i>Enabling environmental responsiveness in ODS</i></p> <ul style="list-style-type: none"> – community visioning – diversity of self-managed initiatives 	<p>Flexibility on the long-term <i>versus</i> utilizing situation specific opportunities on the short-term.</p>
<p><i>Self-organization</i></p> <ul style="list-style-type: none"> – developments emerge out of the interaction between actors without external coordination – systems are able to self-stabilize and self-innovate 	<p><i>Disruptive</i></p> <ul style="list-style-type: none"> – lack of autonomy in building internal organization <p><i>Enabling</i></p> <ul style="list-style-type: none"> – opportunities for establishing new relations and collaborations – manageable size – actor's own motivation and interest are central in initiating collective action – smooth navigation of and possibilities to contribute to institutional frameworks 	<p><i>Enabling self-organization in ODS</i></p> <ul style="list-style-type: none"> – local initiators as main stakeholders – community visioning – account manager – facilitating the setting up and execution of initiatives 	<p>Triggering the self-innovating and self-stabilizing capacity of urban systems <i>without</i> fostering processes of social segregation and social exclusion.</p>

(continued)

Table 2. Continued.

Properties of complex adaptive systems (CAS)	CAS-based conditions for urban adaptability	Opportunities for creating enabling conditions derived from cases	Resulting dilemmas for planners
<p><i>Coevolution</i></p> <ul style="list-style-type: none"> – developments are generated by a mutual adaptation process between (sub)systems 	<p><i>Disruptive</i></p> <ul style="list-style-type: none"> – one system or subsystem directs the paths of others, while ignoring their feedback – linear planning process <p><i>Enabling</i></p> <ul style="list-style-type: none"> – modular development – systematic learning 	<p><i>Enabling coevolution in ODS</i></p> <ul style="list-style-type: none"> – open-ended development trajectory – minimization of upfront investments in public facilities – global land use plan – evaluation of guiding rules 	<p>Altering conditions for development as part of an coevolutionary process <i>without</i> losing the confidence of project initiators and other actors in the development process.</p>

for developing initiatives. However, the open-ended development trajectory does not mean ODS represents an ‘anything goes’ approach.

The open-ended development trajectory is accompanied by guiding rules. In both cases, these rules display three functions, all of which are involved in achieving a delicate balance between generating openness and flexibility on the one hand, and avoiding possible negative consequences and fostering preferred directions of development on the other. First, guiding rules are used to create and secure flexibility during the development trajectory. The global land-use plan for Vossenpels and the compulsory reservation zone for possible future infrastructure network extensions in Oosterwold are examples of this. Second, guiding rules are used to integrate societal values, norms and agreements in the development process. For example, they prevent initiators from creating a nuisance for neighbouring initiatives, and as such protect their utility, liveability and financial value. The third and final function of the guiding rules is about stimulating the emergence of desired trajectories, such as the rise of an urban district in a ‘countryside-like setting’ in Oosterwold. The fixed ratio between urban land, nature and farmland for each plot is an example of a guiding rule which helps bring about such an outcome.

In contrast to the first two types of guiding rules, the third type of condition aims to support the emergence of particular kinds of urban configurations over others. This brings us to the dilemma planners face between enhancing urban adaptability against promoting desired directions of future development. The former can support cities in coping with and profiting from different potential development directions, while the latter addresses those issues or threats which require collective efforts. Examples include climate change, affordable housing or sustainable transportation. In other words, being adaptive does not mean being indifferent about those trajectories which may emerge over time. ODS practices show how planners try to overcome this dilemma by formulating the conditions for development cleverly. For example, by fostering a ‘countryside-like setting’ in Oosterwold by only defining the ratio between land-uses, some flexibility is retained around how the land-use types are organized, what kind of urban, nature or agriculture functions will be realized, and which arrangements can be formed between plot owners regarding user rights and maintenance responsibilities. In Vossenpels, the guiding rules with regard to a project’s design and function are much more strict, partly initiated by the inhabitants themselves, limiting the spatio-functional adaptability of an area. Here, it is important to consider that

Vossenpels includes a much smaller area and may nevertheless contribute to an adaptive urban patchwork when considered in combination with its surrounding areas.

All in all, ODS practices indicate that by combining different types of conditions, planners can strengthen the capacity of urban areas and at the same time make desired trajectories more likely to emerge. However, we also learned from the cases that these ideals cannot be supported equally without friction. Therefore, a delicate balance which corresponds to the volatility of a specific situation has to be achieved in the design of the conditions.

Enabling responsiveness to the environment while utilizing situation-specific opportunities

ODS practices direct planners to support the responsiveness of urban systems to changing circumstances by formulating conditions for development at certain levels of abstraction. However, this also brings planners a dilemma, as certain potential short-term positive effects and negative effects will be closely linked to the particular situation. Generally formulated conditions, which generate flexibility in the long term, may not accurately trigger or mitigate the potential developments related to these conditions in the short-term.

Community visioning activities such as those conducted in Vossenpels can help overcome this dilemma. In addition to exploring likely future development trajectories for an area, they also strengthen awareness of the area's distinctive qualities among its future citizens and users. As discussed in Deriving conditions for urban adaptability by portraying cities as complex adaptive systems section, this can in turn support an area's ability to connect contextual trends and stimulate actors to seize opportunities and prevent, as far as possible, problematic issues from getting worse.

Nevertheless, visioning is only a first step. Adaptability, both in the short and long term, occurs when concrete initiatives produce innovation by integrating changing circumstances with an area's core qualities. Increasing diversity, both in an area's spatio-functional configuration and the established actor coalitions, can foster such innovations. ODS practices show that planners can increase this diversity by using traditional plans and planning regulations differently and by opening up the development process. This way, they trigger and facilitate a variety of conventional and more experimental initiatives while still securing a degree of coherence.

Triggering and fostering self-organization while supporting an inclusive society

In both cases, we identified various conditions which enabled the transformation of areas through the rise of 'spontaneous' urban patterns as a result of a series of initiatives. ODSs provide citizens with opportunities to produce initiatives based on individual motivations and interests. They also encourage them to participate in a collective for designing and maintaining public spaces, as we have seen in the case of Vossenpels. This process of self-expression and self-management is fostered by the project organizations offering different kinds of support for the development process and design of a project. At the same time, the freedom of initiators is limited by the guiding rules which we discussed above, resulting in a situation of 'constrained self-organization' (compare Webster and Lai, 2003). ODS thus indicates how planners can allow self-organizing urban transformation processes within certain boundaries by creating spatial-functional conditions which generate possibility spaces for self-managed initiatives. Moreover, conditions which relate to the capacity building of initiators help these initiatives to mature.

Embracing self-organization mechanisms can support a city's capacity to adapt to changing circumstances. Property owners, citizens and entrepreneurs have often valuable (tacit) knowledge of how a place functions and the sometimes somewhat hidden actor networks behind it. Therefore, their initiatives can collectively contribute to urban systems fitting better with their context. Yet such 'do-it-yourself projects' can also contribute to social segregation and social exclusion. Particular groups may cleverly organize themselves to serve their interests while others may have less capacity to do so or get quietly excluded (Uitermark, 2015). Another possible critique is that self-organized urban developments work on the basis of 'first come, first served' instead of a division of land resources based on social needs. Here lies a dilemma for planners: how to facilitate initiatives and as such trigger the self-innovating and self-stabilizing capacity of urban systems, without fostering social segregation and social exclusion processes.

Although it is still too early to evaluate the effects of ODSs on these processes, the cases show the various ways that planners have tried to address this dilemma. In both cases, the inflow of low-income groups was assisted, for example, by reserving a number of plots for initiatives by these groups, by offering financial and organizational support and by providing preselected, affordable designs which initiators could use as a basis for getting their project design started quickly. Moreover, with community visioning and by appointing account managers, planners aimed to increase the connectivity between actors. Finally, by reserving zones for possible future public facilities, they tried to ensure that long-term societal needs can be met. All in all, ODS teaches us that supporting mechanisms of urban self-organization has to be combined by support for conditions conducive to more inclusive active citizenship practices.

Supporting coevolution while remaining a trustworthy partner in development

ODS practices show several ways that planners can create enabling conditions for coevolution. As we saw in Deriving conditions for urban adaptability by portraying cities as complex adaptive systems section, mutual adaptation between urban districts (or parts of them) is fostered by opportunities for incremental or modular development and systematic learning. With regard to the former, ODS includes at least two enabling conditions. Due to the open-ended development trajectory, project initiators do not anticipate future services or complementary developments to any great extent, as they may do when part of a long-term blueprint development. As a consequence different sections of the area can function relatively independently from one another and this in turn makes adaptation processes in the area easier. A similar argument can be made with regard to the minimization of upfront investments in public facilities in ODSs. The modular development of the infrastructure network in Oosterwold is an illustration of this. By avoiding high upfront investments, a barrier to adaptation as a consequence of sunk costs is diminished.

With reference to systematic learning, the ODS for Oosterwold includes various monitoring and evaluation activities which are expected to be carried out by the project management, ranging from keeping track of the progress of individual initiatives to addressing more fundamental reflections about the area's development potential in a dynamic context in relation to the relevant guiding rules. With regard to enabling coevolution, the latter can be considered an essential element to maintaining a close 'fit' with neighbouring areas as well as the broader context. Meanwhile, opening up the development process as part of an adaptive approach to planning requires public planners to be trustworthy partners who offer a clear and robust set of conditions for development. Changing the 'rules of the game' during the course of an area's development is probably not appreciated by project initiators, as it can frustrate

their plans. Planners are thus confronted by a dilemma: how to adjust conditions for development as part of a coevolutionary process which is fuelled by systematic learning, without losing the confidence of project initiators and other actors in the development process. The cases do not offer suggestions for overcoming this dilemma. However, we believe a joint learning process can be a way to move forward as it closely involves actors in the potential changes to be made. Table 2 summarizes the opportunities and the dilemmas derived from ODS practices for a adaptive approach to planning.

Conclusion

In this paper, we analysed ODS to explore how planners can open up control-oriented planning practices to a more adaptive approach to planning. Two main conclusions can be derived from this paper. First, ODS resonates with the two steps which we consider the essence of an adaptive approach to planning: (1) generating conditions for development which enhance urban adaptability, and (2) tweaking these conditions in such a way that in the course of the area's development, the desired trajectories become more likely to emerge. From a complex adaptive system perspective on cities, ODS indicates how planners can create conditions for development which support the vitality of urban areas in volatile contexts (See Table 2). These are conditions concerned with future spatio-functional configurations and the building of capacity in local actors which are rarely exploited in traditional development strategies. Therefore, we conclude that ODS practices reveal ways to open up control-oriented planning systems to allow for more diverse urban fabrics and to increase the opportunities for incorporating expected and unexpected changes during urban transformations.

Second, the analysis of ODS practices draws attention to the difficult task planners face in finding a balance at the interface between flexibility, inclusivity and desirability. We identified four dilemmas which can be summarized in two main tensions. The first is the tension between enhancing urban adaptability by increasing flexibility versus utilizing situation-specific opportunities and promoting the desired directions of development. The second tension concerns the difficulties in opening up the development process to processes of self-organization and coevolution while supporting societal inclusiveness and providing robust sets of conditions for development in the long term. Fortunately, ODS practices also offer inspiration for how to overcome these dilemmas with the help of cleverly designed conditions for development.

We conclude this paper with two reflections on our research. First, the lessons learnt cannot be generalized to practices beyond the Dutch context without caution. ODS does offer inspiration for planners in different contexts on how to generate conditions for urban adaptability, but we have to keep in mind that they were developed in relation to the specificities of Dutch planning practice. For example, the increased flexibility in ODS is based on the creative use of rules and exemptions within a comprehensive system of protection and legal security (see also Buitelaar et al., 2014). The land for development is in both cases also largely government-owned, allowing planning authorities to set guiding rules without entering into complicated negotiation processes with other landowners. While this is not uncommon in the Netherlands, it is a rather unique situation in comparison to many international practices. Finally, ODS emerged from the specific desire of the Dutch to open up their highly regulated planning system, in which there is limited experience with do-it-yourself initiatives. In other contexts (e.g. informal cities), the starting point for developing adaptive planning strategies might be rather different, including equally different institutional landscapes.

Second, evaluating ODS through a complexity lens illustrates the limited attention in complexity science to questions about divisions of power and equality and inequality (see Cook and Swyngedouw, 2012). Indeed, from a complexity perspective, the conditions for development generated through ODS practices open up development processes for self-innovating and self-stabilizing mechanisms in cities. However, the cases also illustrate the potential risks of this opening-up in the form of social segregation and social exclusion processes, as well as the attempts of planners to mitigate these risks. Therefore, we recommend an analysis of the long-term impact of ODS practices on power divisions and inequalities in urban development processes as a topic for future research.

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Notes

1. Questions addressed in the analysis of ODS practices: How can planning frameworks enable organic urban development? How can top-down and bottom-up responsibilities for generating spatial quality in organic urban development processes be balanced? What opportunities do Dutch planning laws and regulations offer for providing flexibility? What is the role of municipal planners in organic development processes? What organizational characteristics are required of municipal planning agencies to be able to support ODS successfully? To what extent do specific physical characteristics in a development area make the application of ODS more successful? How should public facilities be financed in the context of a gradual development pathway? Not every question has been addressed in each case.
2. An anterior agreement is typically used to ascertain an initiator's financial contribution to the development and maintenance of public facilities when such conditions are not arranged with the help of a land-use plan-related exploitation scheme. In this case, the agreement is also used to describe additional conditions concerning the physical layout of a plot.
3. An *omgevingsplan* is an experimental type of plan which integrates location-specific development regulations, traditionally expressed in the land-use plan, with generic regulations concerning the spatial and environmental quality, normally described in separate bylaws. Instead of zoning, the plan relies on these regulations, which can be formulated quantitatively and qualitatively, to guide urban transformation.

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