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Each year, *plaNext* aims to publish two volumes; one of which presents a collection of original works following an open call, and the other presents a selection of articles from the AESOP-YA conference of the previous year. Representing the former, plaNext Volume six invited contributions from researchers and practitioners in planning and other related fields of research. A number of manuscripts were submitted to be considered for publication in this volume. The authors of the enclosed two manuscripts and one book review were able to meet the deadline set for the publication of volume six. The other manuscripts will be published Online First and included in volume eight. All contributions to plaNext go through open peer-review process before they are published.

## Content

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# Notes on Contributors

*Carissa Champlin* is Ph.D. candidate at the University of Twente, the Netherlands. Her research focuses on the development of game-based approaches for user involvement in the contextualization of Planning Support Systems. She holds MSc degrees in Urban Management and International Development and previously worked at the Habitat Unit of the Technical University of Berlin (TU Berlin).

*Timo Hartmann* is Professor of Systems Engineering at the TU Berlin. He develops state-of-the-art system visualization and simulation technologies and integrates these technologies with the working processes of construction, engineering, and architectural professionals. Timo received his Ph.D. from Stanford University and his Diploma in Civil Engineering and Masters of Computational Mechanics from the Technical University Munich.

*Geert P.M.R Dewulf* is Professor of Planning and Development at the University of Twente. His research focuses on public-private governance issues and strategic planning. He is currently Visiting Fellow at Stanford University. He previously worked at TNO and Delft University of Technology. He holds a PhD from the University of Utrecht and is a former Harvard University Visiting Fellow.

*Mila Koeva* is an Assistant Professor working in 3D Land Information. She holds a PhD in 3D modelling in architectural photogrammetry from the University of University of Architecture, Civil engineering and Geodesy in Sofia. Her main areas of expertise include 3D modelling and visualization, 3D Cadastre, 3D Land Information, UAV, digital photogrammetry, image processing, producing large scale topographic and cadastral maps, GIS, application of satellite imagery for updating cadastral information among others. She is Chair of 3D GeoInfo 2018 and co-chair of ISPRS WG IV/10 Ädvanced Geospatial Applications for Smart Cities and Regions".
She is also Project Coordinator of its4land, a multidisciplinary European Commission Horizon 2020 project, involving 8 academic and private-sector partners and 6 countries in Europe and Africa - www.its4land.com.

*Monica Lengoiboni* is an Assistant professor of Land Management at the Faculty of Geoinformation Science and Earth Observation (ITC), at the University of Twente in the Netherlands – since 2014. She holds a BSc in Geoinformation Science (Wageningen Unviersity) and a PhD in the field of Land Administration (focus on the land rights of nomadic pastoralists in the context of formal land administration systems) - from Wageningen University in collaboration with ITC. She works closely with the Eastern Africa Land Administration Network (EALAN) – a network of 12 universities engaged in land administration related studies and activities in Eastern and Central Africa.

*Marko Marskamp* is a PhD candidate in the Department of Geography at the University of Lausanne. His research looks at the remaking of land use standards and its politics in rezoning cases in Vancouver and Zurich. He is a co-editor and contributor to the 2017 book Relational Planning: Tracing artefacts, agency and practices.

*Eunice Offei* is an employee of the Land Valuation Division of Lands Commission, Ghana. In 2009, she obtained a B.Sc. (Land Economy) from the Kwame Nkrumah University of Science and Technology. She also obtained an MSc. (GIS for Land Administration) from ITC-Faculty of Geo information Science and Earth Observation, University of Twente in 2016. Eunice is a Professional member of the Ghana Institution of Surveyors (GhIS). Her expertise include Valuation, Estate Management, Land Rights and Land Tenure systems and Land Registration. She is a member of the National Engineering Coordinating Team. She is currently a Land Administration Officer at the Compensation Unit of the Land Valuation Head Office, Accra

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# Mapping the Use of Planning Support in a Strategy-Making Session

Carissa Champlin
University of Twente, The Netherlands
Corresponding author: c.j.champlin@utwente.nl

Timo Hartmann
Technical University of Berlin,Germany

Geert P.M.R Dewulf
University of Twente, The Netherlands

This paper introduces an alternative means of evaluating the performance of planning support systems. These systems that were originally developed to support the professional tasks of planners have been assessed primarily based on their task-technology-user fit. During the tasks of early planning phases, planning actors attempt to adapt planning issues out of their 'wicked' state and into clear directions for action by means of communication. The search for better support of adaptations that result from these complex, multi-actor communications requires a more dynamic means of evaluating planning support. To gain a deeper understanding of planning support use during actor communications, we conducted a strategy-making session using preliminary modelling, sketching, facilitation and traditional support tools. We visualized the session as a network of communicative interactions and identified planning support involvement during key issue adaptations. Findings show that preliminary modelling and sketching were often used when identifying planning issues and adapting them into attributes for scenario development and that unsupported dialogue was used to communicate in depth about project objectives. We conclude that introducing planning support as needed in formats that are both visual and easy-to-understand may add value to strategy making in workshop settings.

***Keywords:*** Communicative interactions, facilitation, planning support systems, preliminary modelling, sketching, social systems.



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## Introduction

The introduction of the complexity sciences to the study of cities has generated new insights into highly networked urban environments where everything seems connected to everything else (Healey, 2007; Castells, 1989). Only recently has the planning of these environments been examined rigorously from a complexity perspective (Portugali, 2012). Research on complexity in planning has been compiled in publications under the header of complexity theories of cities (CTC) in edited books and in a 2016 theme issue of Environment and Planning B (Sengupta et al., 2016; de Roo et al., 2012; Portugali et al., 2012; de Roo & Silva, 2010). Contributions within these publications describe the open, multi-actor, nonlinear processes of the communicative rationality model that currently dominates European planning, and argue for an openness to the diversity of knowledge that new actors bring to spatial planning (de Roo & Rauws, 2012). Others caution that too much structuring of these communicative planning processes may produce too simple results (Sijmons, 2012).

Planning support tools that were traditionally designed to address reasonably clear problems have not made a successful transition to these complex, multi-actor contexts (Albrechts & Balducci, 2013). This reality has opened the current discussion on the added value of planning support systems (PSS) in practice. PSS have been defined as 'geoinformation technology-based instruments that incorporate a suite of components (theories, data, information, knowledge, methods, tools…) that collectively support some specific parts of a unique professional planning task' (Geertman, 2008, p.217). PSS provide useful support during problem exploration and analysis tasks, but expert users consider them of limited added value to problem formulation tasks (Vonk, 2006). This may explain why most PSS have not found their way into the early phases of planning (te Brömmelstroet & Bertolini, 2008). Issues early on are still open and must be sorted out, making early planning phases dynamic and unpredictable (te Brömmelstroet, 2016, 2010).

The added value question has prompted PSS scholars to investigate the task-technology-user fit (Pelzer et al., 2015a; Geertman, 2013; Vonk et al., 2007; Goodhue & Thompson, 1995) to understand the necessary conditions of use of PSS in complex, collaborative contexts. Several recent studies of PSS use have been conducted in workshop settings. These studies emphasize a growing need for environments that nurture communication and shared learning rather than the continued contribution of more analytical information to practice (Champlin et al., 2018; Pelzer, 2017; te Brömmelstroet, 2016; Pelzer et al., 2015b; Pelzer et al., 2015a; Goodspeed, 2013). Such environments should support the exchange of knowledge about planning issues in a manner that gives form to problems at stake (Geertman, 2006). Communication is central to sorting out the different types of knowledge needed to define and locate problems within a complex causal network (Rittel & Webber, 1973). Tool use must be balanced in a way that supports group communication without disrupting it (Pelzer *et al*., 2015b) allowing actors to move planning issues effectively out of the problem mess – a process we refer to in this paper as *issue adaptation*.

Determining the 'fit' of support tools may require a more dynamic means of evaluating planning support performance than what the task-technology-user fit provides. Geertman (2013) proposed a new planning support science (PSScience) research agenda for exploring how to organize planning support instruments (e.g. modelling and visualization tools) in relation to the planning actors (and their knowledge), issues and tasks in place- and time-specific contexts that constitute complex systems. This agenda links planning support research to the growing field of CTC research, and in doing so, it provides a framework for the study described in this paper. We attempt to move 'beyond metaphor' in the application of complexity thinking (Sengupta *et al*., 2016, p.970) to examine the fit between planning support tools and planning issues in a strategy-making session.

We pose the following research question: Which planning support tools are in use when adaptations of planning issues occur? This question explores how actors organize the use of various planning support options at their disposal and for what purpose. Concepts from social systems and complex adaptive systems (CAS) theories are employed here to identify the paths of issue adaptation within a communication network. We also consider how to align planning support development with the context-specific knowledge of planning actors. It is thought that exposing developers to this knowledge during the development process improves the substantive quality of the support (te Brömmelstroet & Schrijnen, 2010).

This paper continues in the next section with an introduction to systems theory which underpins this study followed by a discussion of planning support tools that may be well-suited to support planning at an early stage. After introducing the case study, we describe the strategy-making session and method for analyzing the data that was collected during the session. We then report and discuss the empirical findings. Finally, we conclude the paper with a discussion and reflections on both the potential and limitations of the analysis method as it relates to the advancement of professionally supported collaborative planning sessions.

**Systems Theory**

In their seminal paper, Rittel and Webber (1973) attributed 'wicked' problems to networks of interconnected systems that make problem centers less apparent. For them, interconnectedness was the source of ill-defined planning problems that cannot be solved, but at best only re-solved. Planning actors attempt to resolve their problems by linking issues to actions and their consequences in a future-oriented 'what if…' examination of possible interventions in a spatial system (de Roo & Rauws, 2012). This process can also be couched in terms of the strategy-making tasks of problem formulation and scenario development (te Brömmelstroet & Bertolini, 2008; Couclelis, 2005). During strategy making, issues must evolve out of their wicked state and become clear directions for action. According to van de Riet (2003), this involves linking the current situation to possible futures and defining evaluation criteria and constraints for making a selection. Through extensive communicative interactions (Luhmann, 1990), planning actors send and receive information as they set a framework for choice making. While planning literature offers ample explanations of *why* actors in a planning system must make choices, social systems and CAS theories shed light on *how* these choices are made.

Choice making determines the well-being of a system and its ability to adapt. A planning system must 'learn' through its communication interactions and adapt its discourse. To trigger these adaptations, planning actors require efficient means of communicating their many planning issues without being left with too few from which to select. Issue selection is, therefore, a balancing act since 'systems that are too simple are static and those that are too active are chaotic' (Miller & Page, 2007, p.129). One mechanism a system uses to strike this delicate balance is *contingency* (Luhmann, 1995). Contingency preserves the complexity of a system by making choices that momentarily reduce complexity. It recognizes the possibility of an alternate path, had other choices been made (Holland, 1995). To determine these paths, different types of knowledge (see Albrechts & Balducci, 2013) are required along with effective means for choice making. Dennis and Wixom (2002) describe how actors reach agreement on the best alternative(s), first by generating a wide variety of options (divergence) and then selecting from these options (convergence). Divergence can be encouraged in a way that reveals actor issues and preferences, or what Harris (1989) calls 'hidden or undeveloped criteria of choice' (p.88). Convergence can then be facilitated to reach agreement on key objectives. When these dynamics of divergence and convergence are executed effectively, contingency can give quality to pure quantity (Luhmann, 1990).

When faced with an elaborate set of choices, actors may adopt mechanisms that structure the choice making process (Miller & Page, 2007). Planning support tools can serve this purpose. These tools demonstrate agency, or the ability to 'manipulate, at least partially, their outputs so as to influence the actions of others' (Miller & Page, 2007, p.95). Couclelis (2005) relates this to the way actors use models to feed information into decisions that influence a spatial system. Planning support tools may, however, have undesirable disruptive impacts on system adaptation. Means of planning support may be unsuited to the task (Webster, 2010) or their outputs may produce too much order, which is at odds with the unpredictable and uncertain nature of planning (Sijmons, 2012).

By now, we know well that planning processes do not neatly follow a 'sequence of well-defined steps' (Bishop, 1998, p.189). Planning support must be designed in a way that provides structure while permitting nonlinearity. There is some indication that nonlinear adaptation can be triggered at discrete moments. According to CAS literature, systems exhibit lever points, i.e. 'points where a simple intervention causes a lasting, directed effect' (Holland, 2006, p.6). Still, scholars know little about how to utilize lever points. Samoilenko (2008) explains, one would require a methodology to search for the lever points, the capability to affect them and upfront knowledge about the impacts the lever points may have. These issues are significant and require research that extends beyond the scope of this paper. But we can already begin to scratch the surface through experimentation and observation that are guided by existing theory.

In his earlier work on lever points, Holland (1995) explained that all CAS have two adaptation properties in common that are well-known in economics, the multiplier effect and the recycling effect. The *multiplier effect* occurs when a resource passes from node to node catalyzing a chain of adaptations and is potentially transformed in the process. Mazhelis *et al*. (2006) explains, 'the cumulative effect of an initial change (interaction) is increased (multiplied) as the change is propagating through the network' (p.7). Applied to strategy making, we can imagine an issue being triggered to 'firework' into multiple measurable or location-specific attributes that can be used in scenario development.

The *recycling effect* uses the same raw input that, cycle after cycle, is captured and reused at each node of a path (Holland, 1995). As strategy making evolves from a discussion over wicked problems to clear directions for action in the spatial system, recycled planning issues can be traced back to (nearly) every communicative interaction in the adaptation path. The recycling effect may indicate the efficiency of the system in capturing and reusing issues during adaptation. Efficiency has been used as an indicator in PSS and decision support systems (DSS) studies to measure the influence of information technology on group or organizational performance in decision making (see Yamu, 2014; Shim et al., 2002).

**Early-stage Planning Support**

We define planning support as 'all the professional help in the form of dedicated information, knowledge and instruments that intentionally improve planning processes…and or planning outcomes' (Geertman, 2013, p.51). This definition originates from PSS literature, but it acknowledges that PSS are one of many planning support tools. It can generally be said that these systems are developed with a specific professional task in mind (Pelzer et al., 2015a; te Brömmelstroet, 2012; Geertman & Stillwell, 2004; Goodhue & Thompson, 1995) and therefore, are not well-suited for other tasks. In this section, we review tools that are known to support group work and, therefore, may support communication during strategy making in a more dynamic manner. By dynamic, we mean the reciprocal adjustments that users, tasks and supporting tools must make to be responsive to a specific context of time and place

(Geertman, 2013). We explore the potential contribution of these tools to the strategy-making tasks of problem formulation, objective setting and scenario development.

***Preliminary modelling***

Dialogue between developer and intended user is the cornerstone of group modelling approaches (e.g. system dynamics modelling, mediated modelling) and is now becoming an integral part of PSS development (te Brömmelstroet & Schrijnen, 2010; Voinov & Bousquet, 2010). According to te Brömmelstroet and Schrijnen (2010), 'the focus shifts away from the development of a technically more sophisticated support system, towards a process of PSS development that is intertwined with the planning process itself' (p.3). Modelling provides a structured process for working out the most important issues of a problem (van den Belt, 2004). It can be used to determine what factors or variables to include or exclude from the system boundary by stimulating the divergent thinking that is necessary during problem formulation or model conceptualization (Vennix, 1992).

A preliminary model can be developed prior to the beginning of a workshop based on input from interviews (van den Belt, 2004). Since the model is in an early state, end users can recognize and critique assumptions relatively easily. Critiquing and redesigning flawed parts of the model can lead to group ownership and creativity (Vennix, 1992). Preliminary modelling entails more than working out relationships of abstract concepts. Ford and Sterman (1997) hypothesized that 'pushing experts to describe relationships at the simulation model level helps them to clarify and specify their knowledge more than they would if we worked at a more abstract level' (p.313).

***Traditional tools***

While a continued openness to new PSS technologies is desirable (te Brömmelstroet *et al*., 2014), there are limitations to their capacity to support planning in the strategic phases. At a time when computers were new to the collaborative planning arena, Shiffer (1992) observed that participants would often opt to use more passive media like flipcharts in meetings. Integrating such traditional tools with new technologies may create the social learning environment that enables productive interaction (Al-Kodmany, 2001). Sketching is a tool that invites participants into the design process by using visualization as a common language and in doing so, promotes dialogue and provides accurate design information for later applications (Al-Kodmany, 2001; King *et al.*, 1989). Sketching on a map can be used to rapidly work out spatial relationships between elements without knowing their geographic positions (Hopkins, 1999). It is a visualization method whose strength lies less in the accuracy of information it conveys than in its capacity to stimulate communication.

***Facilitation***

Janssen *et al.* (2006) state that the more uncertainties involved in the task, the more dialogue should be facilitated. Facilitation involves dynamic interventions to manage relationships between actors, tasks and tools, to structure tasks and to contribute to achieving meeting outcomes (Hayne, 1999). Hirokawa and Gouran (1989) explain that facilitation should address both procedural and substantive problems. This is necessary since process and outcome are often blurred (Innes & Booher, 1999). *Procedural* facilitation deals with agenda setting, time keeping and ensuring that discussion remains relevant. *Substantive* facilitation manages the use of available information for making group choices. Noting that tool use often interrupts communication, Pelzer *et al*. (2015b) added *tool-related* facilitation to this list. They concluded that facilitation performs an important function in PSS workshops to encourage tool use while also providing sufficient space for group discussion.

Dialogue itself is considered a means of planning support. The Habermasian notion of reflexive dialogue refers to the collective interpretation of the world and agreement in a specific context using the richest available resources to test assumptions (Healey, 1999). If well-managed, dialogue can produce high-quality agreements, flexibility, learning and change (Connick & Innes, 2003), all of which are needed – though difficult to attain – in complex, multi-actor contexts. On this basis, we suggest that the aim of planning support, particularly during strategy making, is not to support a specific planning task or user need, but rather to support dialogue in its handling of planning issues. We hypothesize that by untethering the components of the task-technology-user fit, we will see patterns of planning support use that do not fit neatly within a specific planning task or correspond to an individual user need.

## Case Description and Methodology

The purpose of the empirical study was to examine the issues planning actors discuss in a strategy-making session when using different types of planning support. In this section, we describe the case study, the strategy-making session and the analysis method.

### *The Turfkade case*

The 134-hectare Turfkade business terrain sits in Almelo, a city in the eastern part of the Netherlands, roughly 30 km from the German border. The terrain primarily consists of mid-sized industry and producers, some of which own their own buildings while others rent. The terrain, which dates back to the 1800s, received its last significant modernization in the 1970s. Currently, the combined impact of industrial sector decline and proliferation of younger commercial terrains in the region has pressured the local government to invest in revitalization. The Province of Overijssel initiated the Turfkade project by providing support and financing through *Herstructureringsmaatschappij Overijssel* (HMO), a company established to stimulate investment in the industrial terrains, business parks and inner cities of Overijssel.

To gain a better grasp of the planning problem, we visited the business terrain three times, interviewed the account manager, a city planner, the director of HMO, and a Province official who were involved in the project, reviewed project documents and conducted a project maturity assessment with the account manager. The results of the maturity assessment primarily indicated that: stakeholders were not involved in the revitalization project and were unaware of the potential impacts of the project. Furthermore, the planners were interested in utilizing planning support tools but so far, no support technologies or visualization techniques had been used. Based on the assessment results, we suggested to conduct a strategy-making session with the account manager and some representatives of the business owners. During the session, we would collaboratively develop a model that the account manager could use to communicate project plans and receive feedback from a larger group of business owners.

### *The strategy-making session*

We use the PSScience research agenda (Geertman, 2013) as a framework for describing the Turfkade strategy-making session as a system that consists of planning actors, issues, tasks and their relations in a given context of time and place (see Table 1):

- The *planning actors* included the account manager, a business owner[1] (referred to as the Turfkade actors), a session facilitator (first author) and a chauffeur (second author) who facilitated interaction with the model. Following the action research method Baskerville (1999), the authors performed a role similar to organizational consultants.

[1] A second business owner was scheduled to participate but cancelled on the day of the session.

According to this method, researchers intervene in the problem setting and engage in participatory observation.

- We derived the three *planning tasks* from studies of strategy making (te Brömmelstroet & Bertolini, 2008; Couclelis, 2005), non-routine planning tasks (Batty, 1995) and policy making in multi-actor contexts (van de Riet, 2003): problem formulation, objective setting and scenario development.
- The *planning issues* were the products of the three strategy-making tasks. Throughout the strategy-making tasks, issues originating from the planning problem adapted into project objectives, attributes of the planning issues, scenarios and indicators for assessing the scenarios.
- The *planning support instruments* included tools known to support multi-actor communication (see Early-stage Planning Support): preliminary modelling, sketching, flashcards and procedural, substantive and tool-related facilitation.
- We conceptualized the *factual role of planning support* as planning support involvement in the successful adaptation of a planning issue during one or more communication interactions.
- The context of planning support was the Turfkade strategy-making session

Prior to the session, the second author programmed a preliminary model of the Turfkade terrain on a Google Maps base layer using JavaScript, which the first author then used to create a buildings layer. This layer consisted of building quality ratings that the account manager sketched on a paper map of the project area. The building quality ratings ranged from one (old or poor condition) to five (new or good condition). The preliminary model included an area deterioration indicator that was generated using the building quality ratings and a building proximity measurement. The proximity measurement factored the quality ratings of neighboring buildings into the quality rating of a given building to indicate the perceived quality of the area.

**Table** 1 Adapted version of the PSScience research agenda (Geertman, 2013, p. 53) to describe the components of the Turfkade session.

| | Substantive categories | Turfkade session |
|---|---|---|
| Elements | ▪ Actors involved | ▪ Account manager, business owner, facilitator, chauffeur |
| | ▪ Planning issues (in categories) | ▪ Planning problem, issues, objectives, attributes, indicators, scenarios |
| | ▪ Planning tasks | ▪ Problem formulation, objective setting, scenario development |
| | ▪ Planning support instruments | ▪ Preliminary modeling, sketching, flashcards, facilitation (including procedural, substantive, tool-related) |
| Relations | ▪ Factual role of planning support | ▪ Successful adaptation of planning issues |
| Context | ▪ Place- and time-specific environments of planning support | ▪ Turfkade strategy-making session |

The strategy-making session was not scripted. Instead, the first and second authors planned a sequence of planning tasks: problem formulation (issue divergence), objective setting (issue convergence) and scenario development (attribute divergence). They also decided in advance when to introduce the different planning support tools. The second author opened the session by introducing the preliminary model. The Turfkade actors worked with the area deterioration indicator as an ice breaker for the problem formulation task. Next, flashcards were introduced for objective setting. The Turfkade actors were each asked to choose flashcards

corresponding to their four most important issues (collected during the four interviews). If their main issues were not on the card, they could write in new issues on blank flashcards. The Turfkade actors were instructed to use these main issues as a basis for setting three objectives. Due to time restrictions, the Turfkade actors were asked to select the two most important objectives to work with for scenario development. Finally, they were instructed to sketch possible solutions that met the two objectives as descriptively and creatively as possible. The authors determined when to provide substantive, procedural and tool-related facilitation as needed.

### *Analysis of the session*

To conduct the analysis, we developed a network that depicts the communicative interactions that occurred during the strategy-making session. These interactions are organized into a network of nodes linked together by edges. The nodes represent issues of the Turfkade project and their adaptation into objectives, attributes, indicators and scenarios, each originating from the project problem: 'degradation of the terrain'. In addition to linking the issues and their derivatives, the edges provide directional information (what did an issue become?) and identifying information (what type of planning support was involved?) about the adaptation of an issue. Directional information is important to record because the way people communicate does not follow the linear progression of steps (Engeström, 2011). We define adaptation as the transformation of an issue into something characteristically different than its previous state. When issues can be classified in a new category or are clarified using more specific or descriptive detail, they qualify as issue adaptations.

We captured the communicative interactions among the planning actors using written records on session materials, audio-visual recordings and photography. We began the analysis with an open coding (Strauss & Corbin, 1990) of the session transcript, first by hand and then using ATLAS.ti 7 software. During open coding, we marked each instance in the transcript where an issue was communicated and color-coded them by issue category. Next, we transferred these instances in chronological order to an Excel spreadsheet and categorized them based on strategy-making task. Once each instance was registered, we interpreted the links between the instances. If the same issue was communicated multiple times without adapting, we identified it as a *recurrence* and labeled it with an asterisk. We then visualized this chronological list of issues and the communicative interactions (edges) that link them in network form using Microsoft Visio 10.

Next, we returned to the audio-visual recordings to cross-check the type of planning support that was being used during each adaptation and labeled the edges correspondingly. If no planning support tool was in use during the adaptation, we labeled the edge 'dialogue'. In the next section, we demonstrate the use of the network by describing four adaptation paths before introducing the entire network.

## Findings

### *Path 1. Contingency*

Figure 1 illustrates contingency in the network of communicative interactions. Divergent communicative interactions about the planning problem 'degradation' produced 31 issues.

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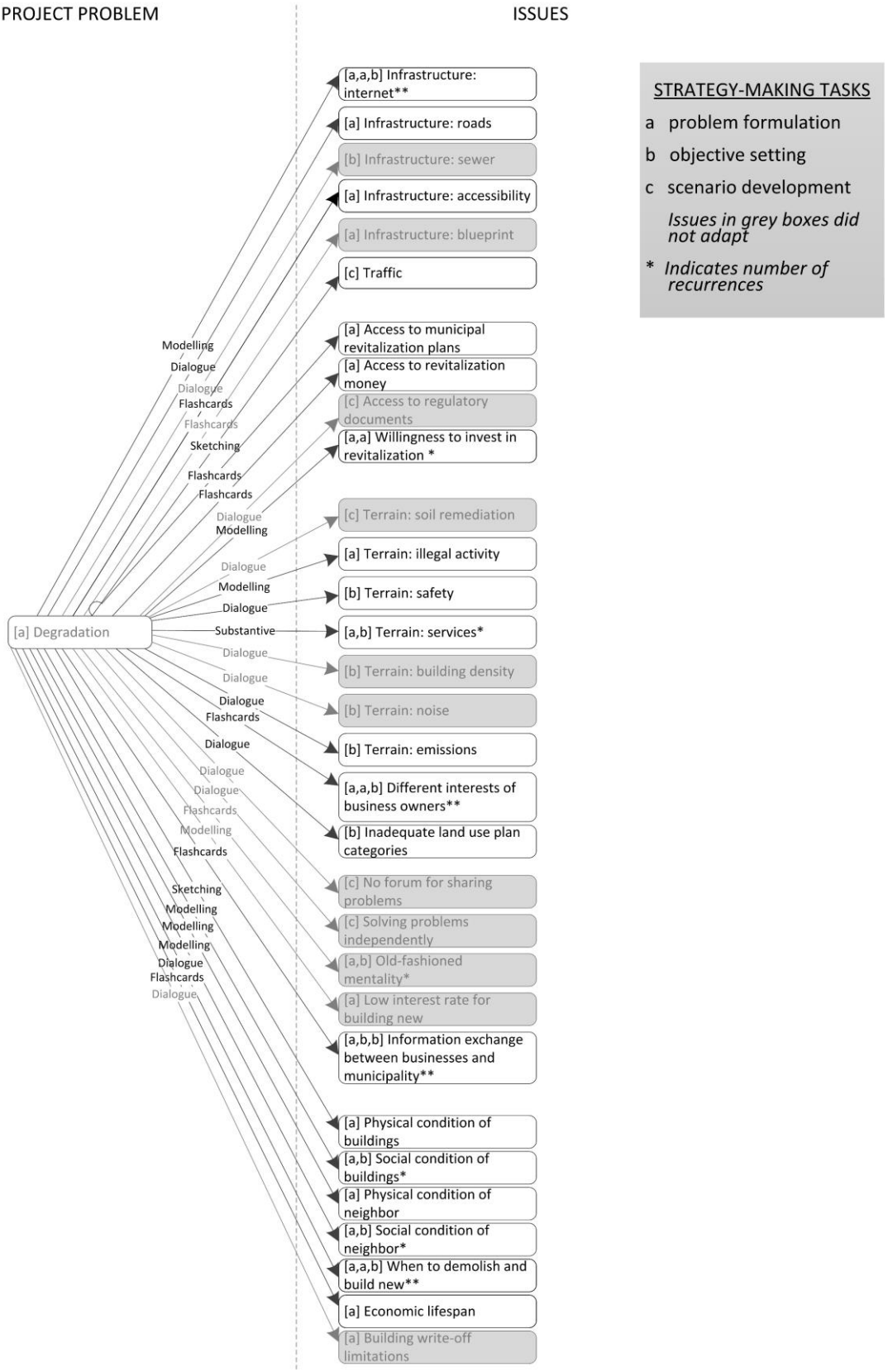


*Figure 1. Contingency path with issues that did not adapt marked in grey. Source: Author.*

Convergent communicative interactions resulted in the selection of 20 issues for adaptation, while 11 issues (grey boxes) were not selected. Of the planning support options, preliminary modelling and flashcards were both associated with the most issue adaptations. Each of these options was used in the selection of six (6) issues followed by dialogue (5), sketching (2) and substantive facilitation (1). Procedural and tool-related facilitation were not observed in any of the adaptations. Dialogue (8) was most often associated with issues that were not selected, followed by flashcards (2) and preliminary modelling (1). This means we found the involvement of one of the planning support options in three-quarters (0,75) of the issue selections, while we associated dialogue with the majority (0,73) of the issues that were not selected. The contingency path also shows that of the five issues that appeared in the communication network during scenario development (c), only one of these issues 'traffic' underwent adaptation.

***Path 2. Multiplier effect***

The second path (Figure 2) illustrates the multiplier effect, where adaptations to the issues 'infrastructure: internet', 'infrastructure: roads' and 'traffic' occurred. During problem divergence, these issues were selected with the use of preliminary modelling, dialogue and sketching, respectively. Adapting these issues into attributes involved the use of sketching only, except for the issue 'traffic' during which procedural facilitation was also in use.

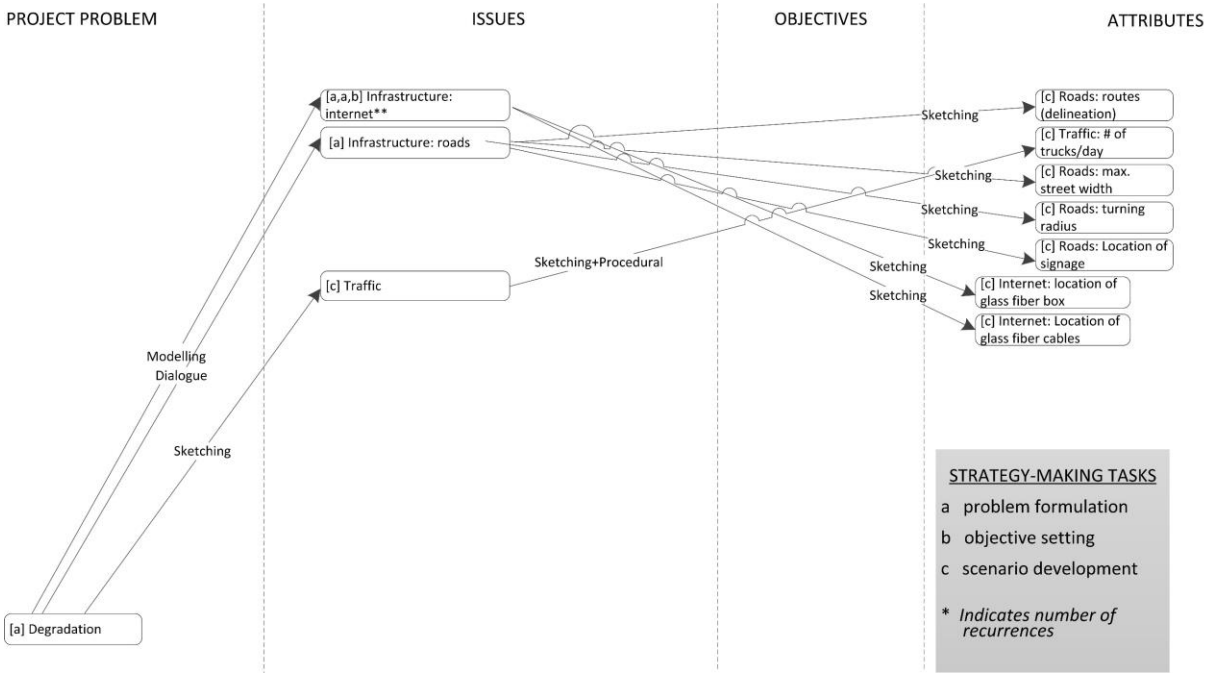


*Figure. 2 Multiplier effect showing issues that adapted into several attributes using sketching and procedural facilitation. Source: Author.*

While sketching, the Turfkade actors had difficulty identifying attributes for scenario development. Therefore, the facilitator and chauffeur explained the type of information they required:

> Facilitator: *We need to know what we should create in a virtual environment to help you discuss with the other stakeholders using these [the model].*
>
> Chauffeur: *If we know what the needs are for each building…then we can say, good,*

> *but at this moment there is an owner who needs internet and because of that the area does not work well. We can calculate this. So, he moves out and someone else moves in to that …with a need for traffic and the traffic is organized well there. Then you can look at how it works.*
>
> Business owner: *Measurement of the delivery intensity, how easily can I access the main road? …and that clients [of one business] can exit easily without being blocked by freight trucks that make deliveries twice a day randomly to the neighbor.*

Subsequently, sketching was used while the Turfkade actors identified four attributes of the 'roads' issue ('road width', 'route delineation', 'turning radius of trucks' and 'location of signage') and one attribute of the 'traffic' issue ('number of trucks per day'). They sketched two attributes of the 'Internet' issue ('location of fiber optic cables' and 'location of a new fiber optics box').

***Path 3: Recycling effect***

In the third path (Figure 3), flashcards and dialogue were used when the issues 'when to demolish and build new' and 'economic lifespan of a building' were selected. Using only dialogue, both of these issues were recycled into the scenario assessment indicator 'building age greater than 25 years'. Subsequently, the facilitator and chauffeur supported the Turfkade actors substantively to create a scenario 'remove all buildings with expired economic lifespan'. The path that resulted in this scenario indicates a link between dialogue and recurrence. The Turfkade actors repeatedly communicated about the issue 'when to demolish a building' throughout the session, first during issue divergence:

> Business owner: *I would wipe a third of the buildings off the map…but they provide ambiance. When do you part ways with the old [buildings]?*

Then during issue convergence using dialogue (recurrence 1):

> Account manager: *when do you say farewell to a building, when its economic lifespan is over?*

And again, during objective setting using dialogue (recurrence 2):

> Account manager: *If you take it [old multi-business facility] out, you revitalize. You give it a new function. It could be that you get a piece of land back where you can do what you want if you arrange it. Then you are a step further.*

Adapting into the indicator 'building age less than 25 years' using dialogue:

> Account manager: *There should be a rule, after 25 years, knock it down. Then you don't hold on to anything and you have plenty of space.*

Subsequently, the indicator 'building age less than 25 years' adapted into a scenario using substantive facilitation:

> Chauffeur: *I have no problem if we develop a plan…where half of the terrain must go…And we conclude that we must demolish a portion and then that portion can continue on a smaller scale.*
> Account manager: *That's what needs to happen here.*

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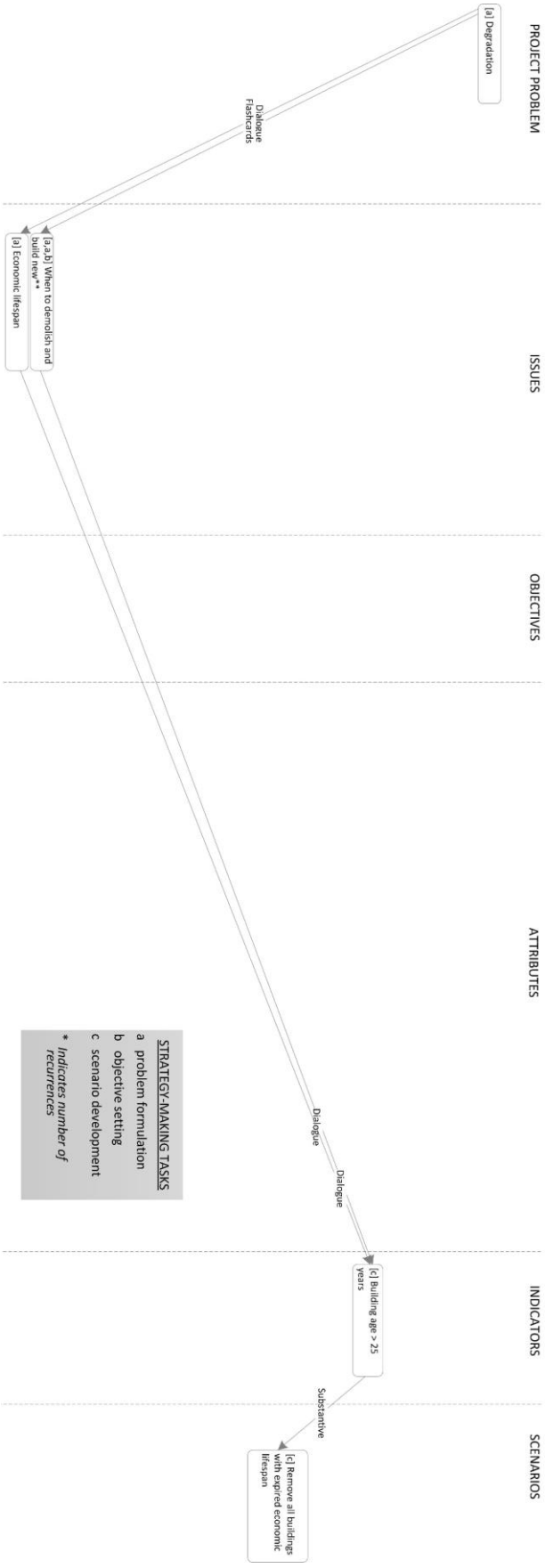


Figure. 3 Recycling effect showing the adaptation of issues from project problem to scenario. Source: Author.

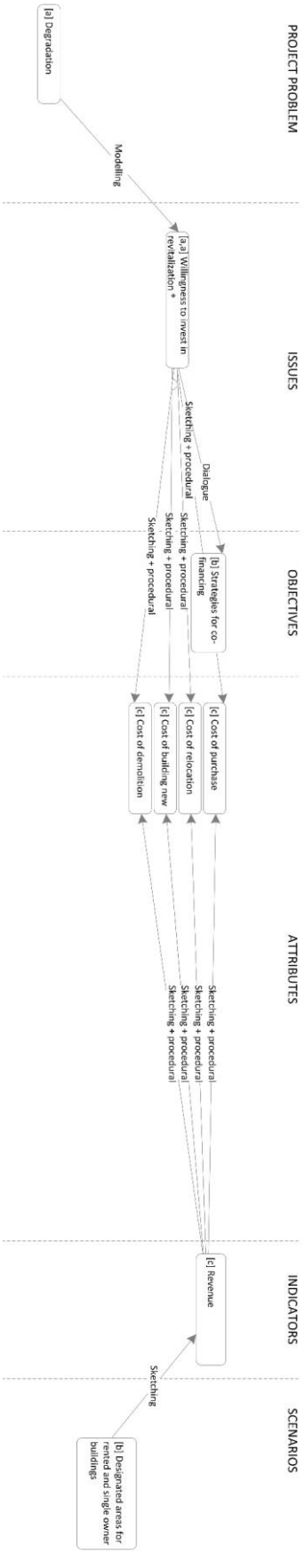


*Figure. 4 Combined multiplier and recycling effects shown in a single path view. Source: Author.*

***Path 4: Combined multiplier and recycling effects***

Another path (Figure 4) demonstrates how a combination of the multiplier effect and the recycling effect integrates issues, an objective, attributes, an indicator and a scenario into a single path. First, preliminary modelling triggered a discussion about the issue 'willingness to invest in revitalization'. Subsequently, the Turfkade actors used dialogue to adapt this investment issue into the objective 'strategies for co-financing'.

During objective setting, the actors adapted the scenario 'designated areas for rented and single owner buildings' into the indicator 'revenue'. Then during scenario development, the abovementioned issue and indicator were adapted into a set of attributes using both sketching and procedural facilitation:

> Account manager: *What is an attribute here?*
>
> Chauffeur: *That is the where and how much.*
>
> Account manager: *Yes, the attribute is money…'1' is cost to buy, '2' is cost to relocate…and '3' is cost to build new.*
>
> Business owner: *In use. Demolish.* [pointing to different buildings on the map]
>
> Account manager: *Cost to demolish.*

The mapping of the communication network shows that these attributes were generated nonlinearly. The scenario was created during the objective setting task prior to generating attributes which occurred in scenario development. It is also worth mentioning that preliminary modelling and sketching (two support tools that are strong in communicating knowledge visually) were in use during the adaptation of the non-spatial issue 'willingness to invest in revitalization' into several non-spatial attributes pertaining to costs and the indicator 'revenue'.

***Map of all adaptations during the session***

Looking across the complete network of communicative interactions (**Figure 5**), three trends emerge. First, almost every recurrence in the communication network occurred in the contingency path and all but one of these recurrences involved the use of planning support. For example, during a discussion about the *'physical* condition of a building' and '*physical* condition of neighboring buildings', sketching and the preliminary modelling apparently triggered recurrences of two non-spatial issues '*social* condition of building' and '*social* condition of neighboring buildings'. This discussion led to a significant shift in focus for the entire session. An excerpt from this discussion illustrates the shift:

> Account manager: *A building can bring down the quality of its surroundings. And the physical [condition] is significant, but the social [condition] is also significant.*

During objective setting one actor repeated the issue again stating:

> Account manager: *What kind of crowd does [building] attract and how much responsibility, but with the multi-business facility there is no accountability because everyone is a renter.*

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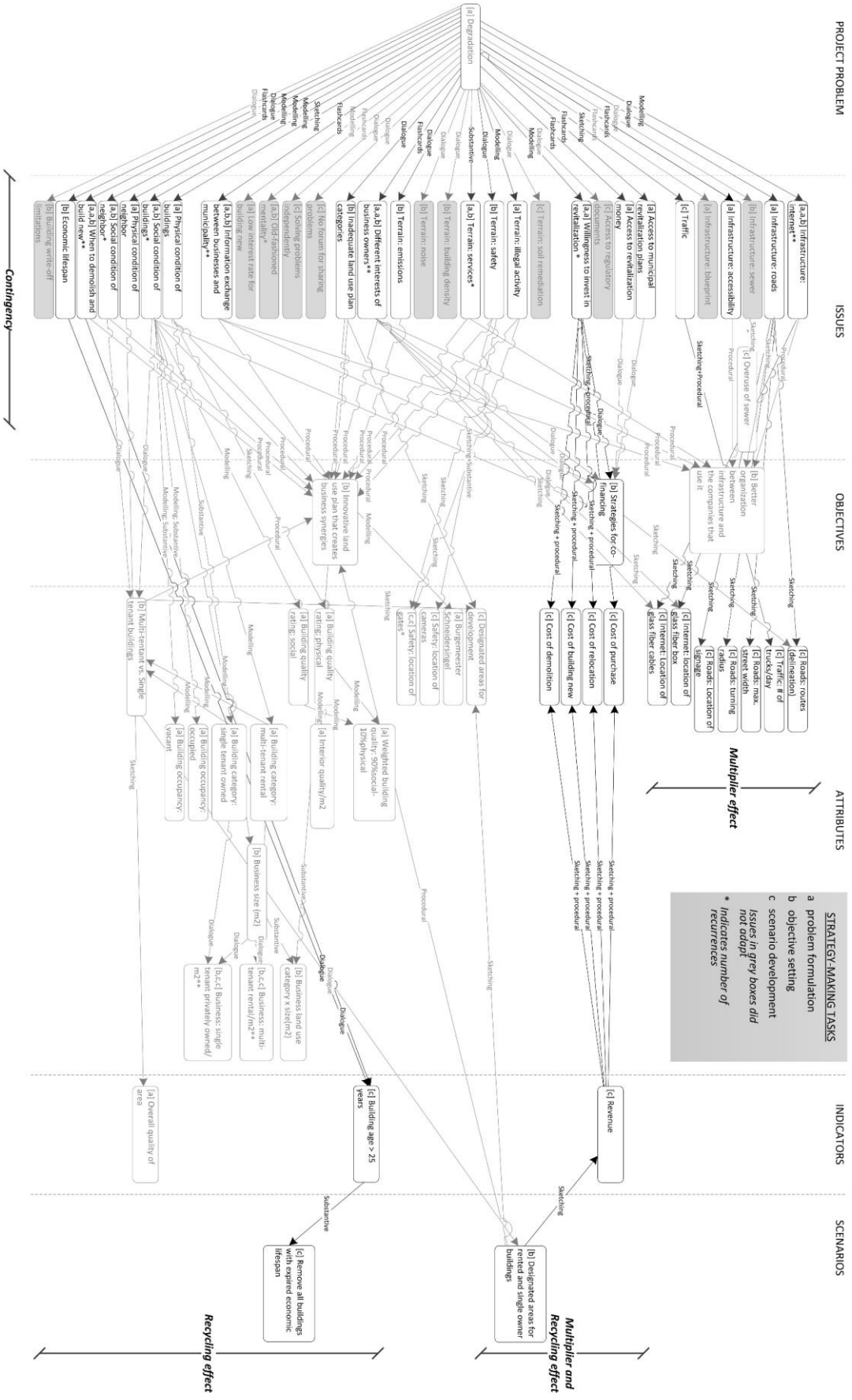


*Figure. 5 Network of communicative interactions with the four paths highlighted Discussion. Source: Author.*

This discussion over the social and physical condition of buildings also demonstrated nonlinearity. Soon after their introduction into the conversation (while using preliminary modelling), the Turfkade actors expressed these issues as measurable attributes (e.g. 'building category: multi-tenant rental', 'building occupancy: vacant'). During objective setting, the discussion reverted to abstracter terms, comparing one building type to another, i.e. attribute: 'multi-tenant vs. single-tenant buildings'. Subsequently, this attribute was linked to the objective 'innovative land use plan that creates business synergies', the indicator 'overall quality of the area' and the scenario 'designated areas for rented and single owner buildings'. Modelling, sketching, procedural facilitation and dialogue were all involved in the recycling of this attribute.

Second, a large number of issues were involved in objective setting and were linked to one or more of the three objectives. Other than the use of procedural facilitation to help structure the objective-setting task, the actors did not use any planning support tools. Instead, they relied on unsupported dialogue.

Third, we observed that when actors communicated about the issue 'multi-tenant versus single-tenant buildings' (while using preliminary modelling), they also created the scenario 'designated areas for rented- and single-owner buildings'. This occurred early in the workshop during the objective-setting task. Subsequently, the Turfkade actors sketched attributes and generated an indicator for assessing the scenario. This trend shows an efficient path of issue recycling that was triggered by the use of preliminary modelling.

**Discussion**

PSS performance so far has been evaluated largely based on the task-technology-user fit of these systems. Given the 'communicative turn' (Healey, 1996) in planning, reciprocal adjustments (Geertman, 2013) must be made between tasks, tools, users and their knowledge to support communication in complex, multi-actor settings. Complexity thinking contributes a new perspective that is focused on the dynamics of communication between actors and across multiple planning tasks. In this study, we have dissected multi-actor communications and examined them at the communicative interactions level to better understand the use of planning support in a strategy-making session. We explored the question: Which planning support tools are in use when adaptations of planning issues occur? We were able to identify several characteristic adaptation paths and the presence of planning support at key moments during these adaptations.

Findings from the contingency path show that issues communicated through unsupported dialogue in most cases were not selected for adaptation. This means the issues were communicated once, but as the session progressed, the actors did not refer to them again. It is possible that unsupported dialogue lacked the structure necessary to focus communication on the most important issues surrounding the area degradation problem. Difficulty gaining clarity about planning issues is a common challenge in planning and it contributes to the well-known 'fuzzy' problems that characterize the early phases of planning. A need for structure might also help to explain why most of the issues that did adapt were identified using planning support of various types. However, once key issues had been identified (issue divergence), the actors seemed to rely heavily on dialogue to gain agreement on their project objectives (issue convergence). This could be seen in the many recurrences of issues linked to the project objectives, indicating that these issues were discussed several times. Here, it seems that actors used dialogue to work out their different understandings and knowledge about a planning issue.

Findings from the multiplier effect path show that some issues were adapted early into model attributes. Although the actors mostly used preliminary modelling or sketching to generate these attributes, more traditional tools were also used to generate the issues from which the attributes emerged. It is conceivable that the use of visualization techniques, particularly the preliminary model, oriented communication towards issues that are more suitable for spatial modelling, perhaps to the detriment of critical non-spatial issues. Geertman (2006) explains we should be aware that some issues lend themselves better to quantitative analytical or modelling support than other issues. On the other hand, working with visual, map-based support methods may provide an effective means to identify important issues, both spatial and non-spatial, and to communicate about them concretely. A good example of this occurred while working with the preliminary model. The actors decided that the physical condition of buildings was not the only factor causing area degradation. Undesirable activities in and around some buildings were also a critical factor. While sketching, the actors diverged to identify multiple interrelated attributes and indicators. In some instances, procedural facilitation was necessary to formulate the indicators. It seemed that the Turfkade actors were not accustomed to communicating about their issues in quantifiable or measurable terms.

In the recycling effect path, we observed efficiency in the communication interactions. Through the combined use of dialogue, flashcards and substantive facilitation, the actors managed to develop a basic but complete scenario. This efficiency finding may indicate that a balance between support tool use and group communication (Pelzer et al., 2015b) was achieved. The combined multiplier and recycling effects path shows that issue adaptations can be even more efficient when both are triggered. The communicative interactions in this path adapted in a nonlinear, non-sequential way. The combination of structure and different visualization methods apparently enabled the actors to move both efficiently and nonlinearly through the strategic tasks of problem formulation and scenario development. Looking at the entire strategy-making session in a single network view, it seems that issues that could be easily clarified and related to the spatial system were quickly adapted using visual, yet easy-to-understand support (i.e. preliminary modelling and sketching) while the less clear, more conceptual issues required unsupported dialogue, and at times facilitation, to adapt. These findings indicate the need for applications of planning support methods in multiple formats to support efficient communication during strategy making.

Together, these findings suggest that factors of structure, visualization and simplicity implemented on an as needed basis may be significant to consider when developing planning support. Since actors may be easily overwhelmed by sophisticated models, softer introductions to the technology like working with preliminary models may prove beneficial. We know from literature that these softer visual methods support divergent thinking, which is needed both for problem formulation and for the production of accurate design information (Al-Kodmany, 2001; King *et al.*, 1989). Furthermore, the active participation of the facilitator and chauffeur in the strategy-making session provided these project ‘outsiders’ contextual information that may be useful for the further development of models and other planning support.

While the design of this study does not permit us to draw conclusions about causality between planning support tool use and communication, the findings do offer an example of how planning support performance can be viewed from a dynamic, issue-oriented perspective. From this perspective, planning support can be evaluated based on its capacity to stimulate adaptations at the communicative interactions level – potentially contributing to progress in a collaborative planning context.

## Reflections

In this study we were interested mainly in the mechanics of how issues adapt during dialogue and also when planning support is used. Further research that engages planning and policy-making theory may provide explanatory power to the observations we have reported. The method we developed to investigate planning support use at the communicative interactions level could be reproduced in sessions with more participants. For large multi-actor group settings, the manual mapping methodology presented in this paper may become too tedious. Online software packages such as Gephi (https://gephi.org/) and NetworkX (http://networkx.github.io/) generate sophisticated network analyses and visualization that may better support the interpretation and communication of large data sets. It would also be interesting to use such software to compare networks of communicative interactions across multiple strategy-making sessions or projects. Such a comparison could help to build theory about causal relationships between planning support and issue adaptations. Nonetheless, it is not too soon to begin experimenting with the principles of structure, visualization and simplicity and incorporating them into games, methods and techniques to provide flexible, customized support to actors during the early phases of planning projects.

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# Compliance with Residential Building Standards in the Context of Customary Land Tenure System in Ghana

Eunice Offei
Lands Commission, Land Valuation Division, Ghana
Corresponding author: offeieunice872@gmail.com

Monica Lengoiboni
University of Twente, The Netherlands

Mila Koeva
University of Twente, The Netherlands

Zoning regulation is considered as a tool used by government to control developments to ensure sustainability. In Ghana where about 80% of lands are held under customary land tenure systems, implementation of residential standards, which is a government function may conflict with customary norms of holding land. This paper uses case study to examine the implementation of residential policies and enforcement of residential standards in areas under customary land tenure in Ghana and if these policies and standards affect the enjoyment of land rights in the context of customary land tenure.

Results showed that non-compliance to residential standards and non-conformity to the local plan has minimal interference on enjoyment of land rights. Residents are ignorant of the details of the residential standards and have never seen a zoning regulations document. There is also low level of monitoring and enforcement. Spatial analysis reveals four main types of non-conformity between orthophoto and local plans i) discrepancies in the orientation of the parcel boundaries, ii) discrepancies in the shapes of plot boundaries, iii) houses constructed on the plot boundary or straddle parcel boundaries, and iii) differences in plot sizes. Results suggest the need for planning authority to use efficient approaches such as GIS and UAV's to communicate, monitor and enforce the residential standards. It is concluded that collaboration between customary land authorities and the Municipality during the allocation and development of plots may improve spatial conformity between orthophoto and the local plans.

***Keywords:*** Residential standards, Customary land tenure system, Land rights, Compliance.



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## Introduction

Land tenure systems are set by the laws governing land in a country. This can be statutory, common law or customary. Many at times, a mixture (legal pluralism) exists in a country. Most peri-urban areas in sub Saharan Africa operate in a pluralist environment where statues and customary laws, government and indigenous institutions, traditional norms and corporate values run parallel. Ghana has a dual system where statutory and customary land tenure systems run parallel in urban, peri-urban and rural areas. Customary lands constitute about 80% of all lands in the country whiles the remaining 20% is owned by the state (Adu-Gyamfi, 2012). Customary lands are managed by chiefs, skin and family heads in trust for the people. This implies that, while access to land is controlled by customary custodians, management through planning comes from the District Assemblies. The mode of land alienation and tenure system can therefore have implications for planning.

Land use planning, a regulatory component of the land administration paradigm (Williamson et al, 2010) ensure sustainable use of land as a natural resource. Land use plans are commonly implemented and enforced through zoning and accompanying regulations. It creates the conditions required to achieve an environmentally sustainable, socially just, desirable and economically sound land use and ownership type (GIZ, 2012). It specifies where permissible land uses such as residential, industrial, recreational or commercial may take place (Onsted & Chowdhury, 2014). Zoning eliminates conflicting uses by protecting the environment, provide amenities and control nuisance thus enhancing land values (Boamah, 2013; Yeboah & Obeng-Odoom, 2010). Thus residential areas are protected from being invaded by commercial and industrial activities and also promote the orderly development of industrial and commercial areas. According to Pressman & Wildavsky (1973), as cited in Loh (2011), the purpose of planning is to control future development, therefore, if this is not achieved then planning has failed.

There are a number of regulations that bond the allotting of residential lands. Such standards prescribe; the land coverage, the form of constructions, the housing density, maximum building heights, environmental protection requirements etc. This is to provide adequate light, good air circulation, protection from fire, overcrowding on land etc. These aims have been challenged over the years by land developers and administrative challenges faced by planners. Arguments against residential building standards are associated with additional cost, delay housing production and lengthen construction process (Mayer & Somerville, 2000; Quigley & Rosenthal, 2005). Another argument put up by UN Habitat (2008) is that land use and zoning affects land rights of people especially those in informal settlements as they are forcefully ejected to pave way for developmental projects because they do not have title to land and means to implement new regulation. Also tenure security may be threatened when acquisition of building permits is expensive and time consuming thus delaying ones right to develop land.

Enforcement mechanisms compel landholders to implement and adhere to the residential standards. Specific enforcement tasks may include: detecting buildings without permits, assessing building plans for compliance with the standards, inspecting buildings during construction for adherence to the residential buildings standards and prescribing appropriate corrections for non-compliance (Schilling & Hare, 1994; Boamah, 2013). Where there is non-compliance, sanctions such as ‘stop work’, fines and demolishing are sometimes used to bring compliance (Arimah & Adeagbo, 2000; Burby, May, & Paterson, 1998). Attributes such as weak enforcement mechanism, complex bureaucratic procedures, Limited resources and

qualified staff (Payne & Majale, 2004; Goodfellow, 2013) can affect effective enforcement. Studies conducted by Arimah and Adeagbo, (2000) in Nigeria showed that fines and 'stop work' were ineffective in enforcing zoning regulations. However, when severe sanctions and penalties such as demolishing are used to enforce regulations, it leads to compliance by new developers.

A number of factors influence the willingness of landholders to comply with the residential standards. Such factors include income levels, educational level, household size and awareness of zoning and residential standards (Alnsour and Meaton 2009). Household income can be linked directly to some aspects of the construction process such as area of the house, design and quality (Fekade, 2000). In countries where earnings are generally low, the extent of compliance can be positively related to the level of income (Alnsour & Meaton, 2009); and larger households demand more space and are unlikely to comply (Fekade 2000). The extent to which people are aware of the existence of standards can also impact on compliance. Low adherence can be attributed to weak enforcement mechanism, complex bureaucratic procedures, limited resources and unqualified staff (Payne & Majale, 2004; Goodfellow, 2013). Administrative practices such as culture and enforcement mechanisms are important for managing and controlling residential development.

Customary rights to land are administered by traditional authorities and rules are generally unwritten. This begs the question: how is land use planning (a responsibility of a government institution) organized, implemented and enforced in a customary tenure setting? The problem here is that zoning regulations impose rules and obligations for the good of the general public but the state does not own the lands needed to implement the plan. The obligation to comply may restrict and interfere with the freedom of customary authorities and landholders to enjoy their land rights.

While a lot of research has been conducted on the effect of land use and zoning regulations on urban form, house prices and pattern of development (Arimah & Adeagbo, 2000; Ayyoob, Yoshihiro, Kohei, Satoshi, & Akito, 2014; Baffour Awuah & Hammond, 2014; Burby, May, & Paterson, 1998), and on the benefits and factors affecting compliance with residential regulations in the context of formal Land Administration, (Alnsour & Meaton, 2009; Baffour Awuah, Hammond, Lamond, & Booth, 2014), little is known about the effects of zoning regulations on land right holders in the context of customary land tenure. This study intends to explore the implementation of zoning regulations in areas under customary land tenure system in Ghana. Results of this study have implications on the relevance of zoning regulations and standards in customary areas. For the purpose of simplicity, zoning regulations and residential standards are used interchangeably.
Three sub-objectives are pursued.

Sub-objective 1 aimed to find out the factors influencing compliance by addressing two issues: firstly, factors that motivate land right holders to implement residential standards (permitted land uses, maximum plot coverage, minimum plot size and types of buildings); and secondly, how enforcement influences land owners to implement the residential standards. Interviewees responded to questions on awareness of the standards, household sizes, income and how monitoring and enforcement influence compliance. Variables such as awareness of residential standards, socio-economic data (size of households, household income and education levels) can be used to answer factors that motivate landowners to comply with residential standards (Alnsour & Meaton, 2009). Enforcement was measured based on the frequency of visits by responsible team and sanctions or penalties given.

Sub-objective 2 focused on how zoning regulations affects the enjoyment of land rights by addressing two issues –i) perception of how the zoning standards interfere with the enjoyment of rights to land; and ii), how land right holders defend themselves against the prescribed zoning standards. Respondents were asked of how zoning regulations (permitted land uses, maximum plot coverages, minimum plot size; and types of buildings and standards) affect their freedom to enjoy their land rights. For sub-objectives 1 and 2, descriptive statistics were used to analyze the qualitative and quantitative data. Results are presented using frequency distribution tables and bar charts.

Lastly, sub-objective 3 focused on spatial analysis for assessing conformity and compliance of the selected plots using:

i) Local plan produced in 1990 and provided by Adenta Municipality in paper form
ii) Orthophoto produced from aerial images with a resolution of 0.2m. Produced in 2014 provided in *.tiff format from Survey and Mapping Division of Lands Commission.

**Study Area**

Accra is the capital city of Ghana. This city, though the smallest of all ten administrative regions in terms of area, is the second most populated (4,010,054 out of total of 24,658,823) accounting for 15.4% of the total population (GSS, 2010). It is the most densely populated with 1,236 persons per square meter. This is an indication of the excessive pressure on land and its related resources in this region. There is therefore an increasing demand for peri-urban lands as the cities get crowded (Arko-adjei, 2011). Developments are fast springing up in peri-urban area as people try to escape the frustrations in the city (traffic congestions, high rents, expensive land etc). This rush for peri-urban lands coupled with lack of development controls can result in various spatial problems. These problems include haphazard development that do not fully comply with residential standards, residential overcrowding, air and water pollution (Meaton & Alnsour, 2006).

The greater Accra region has been divided into 16 administrative districts which includes Adentan Municipality. According to Ghana Statistical Service, (2014), the urban and peri-urban areas of the Adentan Municipality have a higher proportion of houses (59.9%) as compared to the rural areas (40.1%). The Municipality have an average household size of 3.7. About 31.1% of households in the Municipality occupy separate houses and 30.7 percent of households occupy ‘compound’ houses. Improvised homes and uncompleted buildings provide dwellings for about a quarter of households in the Municipality, while Semi-detached houses and flat/apartment form a little over a tenth of all the dwelling units.

Ashiyie is a community in the Adentan Municipality in Accra, Ghana. Ashiyie is a fast developing peri-urban community with a population of about 4,200 (7th populous in the Municipality) with 561 houses and 1,082 households as at 2010. Demographics compose of low and medium income households. Ashiyie lands which cover a total area of 12,000 acres is under the Labadi Stool. The West Ashiyie neighborhood covers an area of about 500 acres and is the focus for this study(GSS, 2014). Lands are owned by the Odumanye Clan of Mnali We. The main inhabitants are the Ga-Damgbe’s while majority of the land use is residential. Majority of inhabitants engage in services, sales and craft related jobs according to the 2014 statistical report of Adenta Municipality. It is located 11.5km from Accra city thus most residents commute to the city to undertake daily activities. West Ashiyie is a peri-urban area whose local plan was developed in 1990 while Ashiyie West was bare land. This makes it one of the few areas in Accra to be planned ahead of development.

**Allocation of rights to land and land ownership**

Land rights are administered under customary tenure. Land is managed by family heads who hold freehold title (allodial interest) in land. The family heads are referred to as customary land authority or custodians/trustees of the land. Individuals (landholders) and estate developers who acquire lands from family heads have 99- year leasehold interest. Land right holders build their own houses – by hiring private developers. It is the responsibility of the land right holder to obtain a building permit from the planning authority at the Adentan Municipality.

**Legal framework for Land use planning (zoning regulations) in Ghana**

Until the passage of the Land Use and Spatial Planning Act (Act 925) in 2016, the Town and Country Planning Ordinance (1945) (Cap 84), was a legislation that proposed the use of master plans through functional land use, discreet zoning, regulation and consensus in the colonial era (Baffour Awuah & Hammond, 2014). It was supported by the Town and Country Planning Act, 1959; Town and Country Planning Regulations, 1959; the Local Government Act (Act 462), 1993; and the Building code (L.I. 1630), 1996. Local Government Act (Act 462), 1993, decentralized planning by making Metropolitan-Municipal-District Assemblies (MMDA's) planning authorities in their jurisdictions. The Adentan Municipality can therefore, prepare implement and enforce local plans. This implies that, although customary land authorities sell land to individuals, the preparation and approval of planning schemes, enforcement and sanctions are carried out by the government (MMDA's). The LI 1630 and the Zoning Guidelines and Building Regulation of Ghana, 2011 on the other hand regulates all physical development detailing the permit application process, permissible land uses, plot sizes, plot coverage and permissible type of building (detached, duplex, compound houses).
In other words, while customary authorities control access to land, management through planning comes from the District Assemblies. The mode of land alienation and tenure system can therefore have implications for planning. The Municipality consults with the customary land owners when creating local plans. The Municipality and customary land authorities together decide on the parcel sizes, which should be referred to when allocating the plots.

The main instrument for land use control in Ghana in recent times is the Land Use and Spatial Planning Act 2016 (Act 925). Act 925 consolidates and revises laws on land use and spatial planning in Ghana. Clause 113 of Act 925 prohibits a person from carrying out any development without a planning permit issued by the District Assembly.

**Methods**

Fieldwork took place in October 2015 in West Ashiyie. Face to face interviews were carried out with the occupiers of the plots (landholders). Key informants i.e. a Municipal Planner (responsible for physical planning); Engineer (responsible for monitoring and enforcement of zoning regulations and building standards); Assembly representative (represents residents'/land rights holders at the Municipality) and two customary authorities ('landlords', they allocate land rights to individuals) were also interviewed (see Table 1). The planner and the engineer provided information on the planning and permitting process, monitoring and enforcement of the regulations, challenges and limitations. The Assembly representative was interviewed on awareness program and challenges faced. Customary authorities were interviewed on their role in the implementation of the zoning regulations. These key informants were purposively selected as they are in a better position to discuss the zoning standards and enforcement, and programs for creating awareness. Below is a summary of respondents

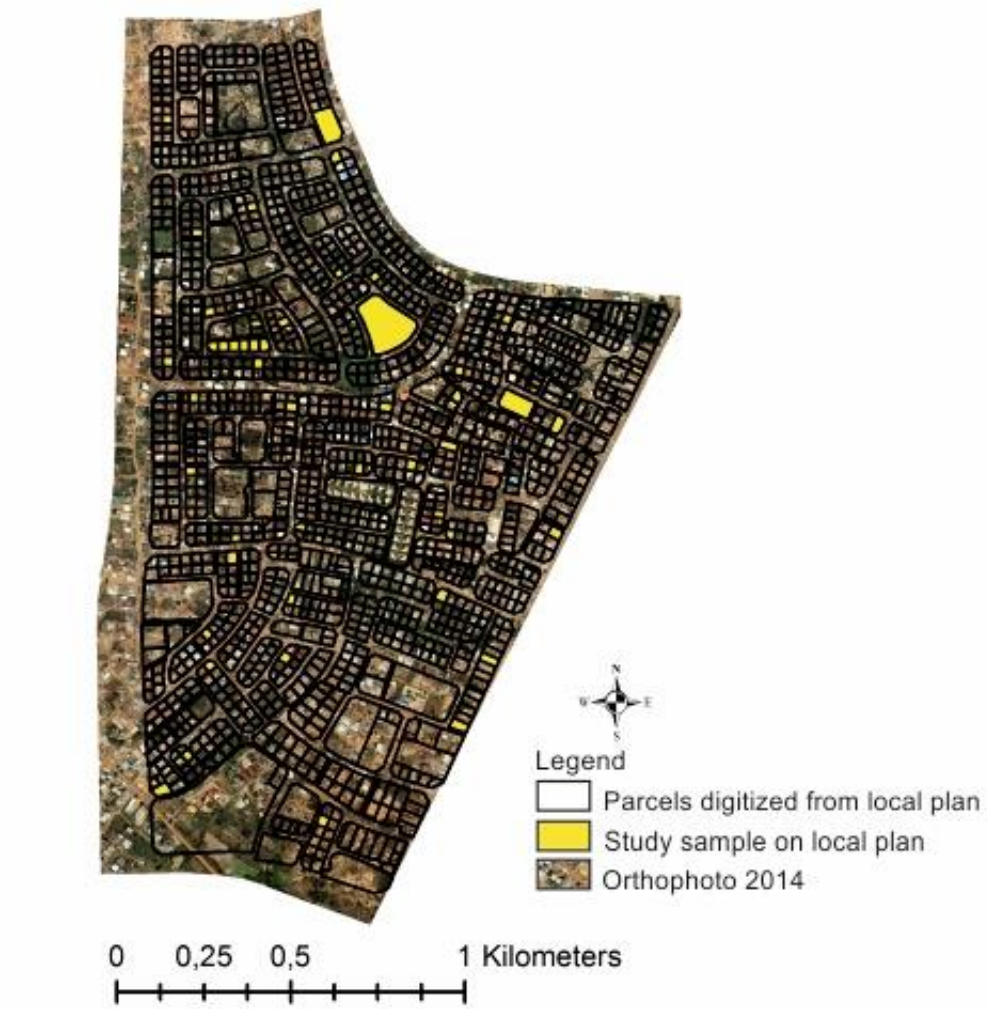


*Figure 1: Study area and parcels selected for this study*

**Table 1.** Interviews

| Key informant | Role of key informant | Number interviewed |
|---|---|---|
| Municipal Planner | Physical planner | 1 |
| Works engineer | Monitoring and enforcement of regulations | 1 |
| Assemblywoman | Represents residents at the Municipality | 1 |
| Traditional Authority/custodians | The allodial owners of Ashiyie lands | 2 |
| Landholders | Those who have acquired land rights from the allodial owners of the land | 44 |

The local plan was used to select the parcels – and therefore the households to be interviewed. Forty-four (44) parcels were identified using Bouchard's sampling formula as shown in the following equation.

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$$Sample\ Size = \frac{\left(\frac{Z_\alpha}{2}\right)^2 \times P(1-P) \times N}{[(E^2) \times N] + \left[\left(\frac{Z_\alpha}{2}\right)^2 \times P(1-P)\right]} \quad (1)$$

$$Sample\ Size = \frac{1.96^2 \times 0.5^2 \times 1{,}376}{[0.15^2 \times 1{,}376] + [1.96^2 \times 0.5^2]} = 44$$

Where;
N = Total population size (1,376 for this study); this is the total number of parcels in the plan
P = The estimated frequency for the sample size N-Proportion of success (50% for this study);
E = Tolerable/margin error (15%); this is the amount of error one is willing to accept in the calculation.
$Z_\alpha$/2 = value given to the confidence interval according to precision desired (1.96).

The households were selected regardless of social economic status of the occupants. According to Alnsour and Meaton (2009), land owners' income, educational level, household size and awareness of zoning and residential regulations can affect compliance. Prevalence of these factors may show willingness and intention to implement or not to implement regulations. Specifications for residential building standards and orthophoto from aerial images (from 2014) were used as a proxy to assess compliance with residential standards. Structured, face-to-face interviews were administered to land right holders and key informants. Land right holders responded to closed and open-ended questions while the key informants responded to open ended questions.

Local plan of West Ashiyie was scanned and georeferenced using Ground Control Points (GCPs) which were obtained with handheld eTrex Garmani GPS during the fieldwork. For accurate superimposition, all raster data was projected to the same coordinate system –WGD 84, UTM Zone 30 N. The boundaries of the plots were manually digitized over the raster local plan in ArcGIS. Plots that had been sampled for this study were digitized over the orthophoto. Fence walls and hedges were used as a guideline in digitizing parcels as they serve as parcel boundaries. Evaluating land use changes and level of conformity were done by overlaying vector data (extracted from the local plan) over the orthophoto. Visual interpretation was used to identify the conformity with the local plan. Spatial patterns can be explored using visualization in Geographical Information Systems (GIS).

## Results

### Factors influencing compliance with residential standards

#### *Influence of awareness on implementation of residential standards*

There is low public awareness of the residential standards. Of the 44 landholders, 14 are aware of the permitted land uses; 6 are aware of the maximum plot coverage; 10 are aware of the minimum plot size; and 11 are aware of the types of buildings and standards. Those aware of the residential standards obtained the information through the radio, neighbors, friends/spouses, and information sessions by the Municipality and experiences from other communities. None of the respondents has ever seen a zoning regulation document.

The Planner and the Assembly woman mentioned three methods used to convey residential standards to the citizens. First, the type of land use and plot sizes are indicated in the indenture

or deed (a written instrument that conveys interest in land by the customary authority). Family heads prepare the indenture. The lessee and lessor are the parties to the indenture with their corresponding witnesses. The customary authority indicates the land size, its location (via a 'site plan') and use in the indenture. Any discrepancies between the indenture and the land uses are to be checked by the Lands Commission before registering the document by requesting for planning comment from the TCPD. There is a gap here as some people build before registering their documents. Secondly, detailed information on the zoning standards are posted on the notice boards at the Assembly. This mode of communicating to use right holders is not effective thus creates uncertainty regarding residential standards. There is therefore high dependence on hear- say, which may not be true. This does not augur well for planning authorities considering the amount of money invested in preparing a physical plan. Thirdly, the Municipality creates awareness through its Residents Association Meetings. Meetings are organized monthly by the Assembly member and Unit Committee members (political representatives of the residents at the Assembly) to educate residents on the Assembly's developmental projects and other matters. According to the Assembly representative, participation is not compulsory hence rarely attended. Therefore, information from the Municipality is not well circulated. The planner indicates it is the responsibility of individuals to check the zoning status and standards before acquiring land. However, none of the landholders was aware of this process. Respondents however were aware that verification of the title document (search at Land Title Registry) prior to acquiring the land was important.

According to the planner, landholders are required to check the zoning status and standards of lands they want to acquire before going ahead to pay for land. However, none of the landholders interviewed was aware of this process thus acquire lands and build with no regards to zoning regulation and residential standards. The only process that is well known in the land acquisition process among respondents is verification of title document (search at Land Title Registry) before buying land. A situation the Planner blames on the Lands Commission inability to help educate people on the land acquisition process since planning regulation is also part of the land acquisition process and the first thing to be checked.

Dissemination of the zoning information has an impact on the levels of awareness, and consequently motivation to implement the zoning regulations. While the residential standards exist, results suggest they are distant from the people. Leaving the responsibility to seek the residential standards to the landholders may give the impression that the zoning regulations are optional for implementation. It is no wonder that just a few residents are aware of the zoning standards. As such, the landholders will pursue what is most important for them, i.e. the security of their land rights. This leads to the residents feeling more responsible to the customary land authorities –in paying ground rent, rather than the Municipality – to implement the zoning standards.

***Influence of household size on compliance with the maximum plot coverage***

More than half of the respondents breached on the plot coverage, according to Figure 2. Ignorance of plot coverage (never heard of it), building to rent (benefit from land) were given as reasons given for non-compliance with plot coverage. Respondents indicated using their own discretion to build on as much of the land as they wished while giving allowance for air circulation. Moreover, Figure 2 shows household size has direct negative impact on compliance with required maximum plot coverage. Respondents from a 3-5 household size fall within the accepted plot coverage of 60%-70%. Similarly, all small households of less than 3 built within the accepted coverage. However, plot coverage for large family sizes (households above 5) exceed the maximum plot coverage. This category of respondents indicated the need to shelter relatives compelled them to maximize available space on their compound. Household size can thus negatively motivate residents to comply with zoning

regulations as they increase shelter space to accommodate their large families.

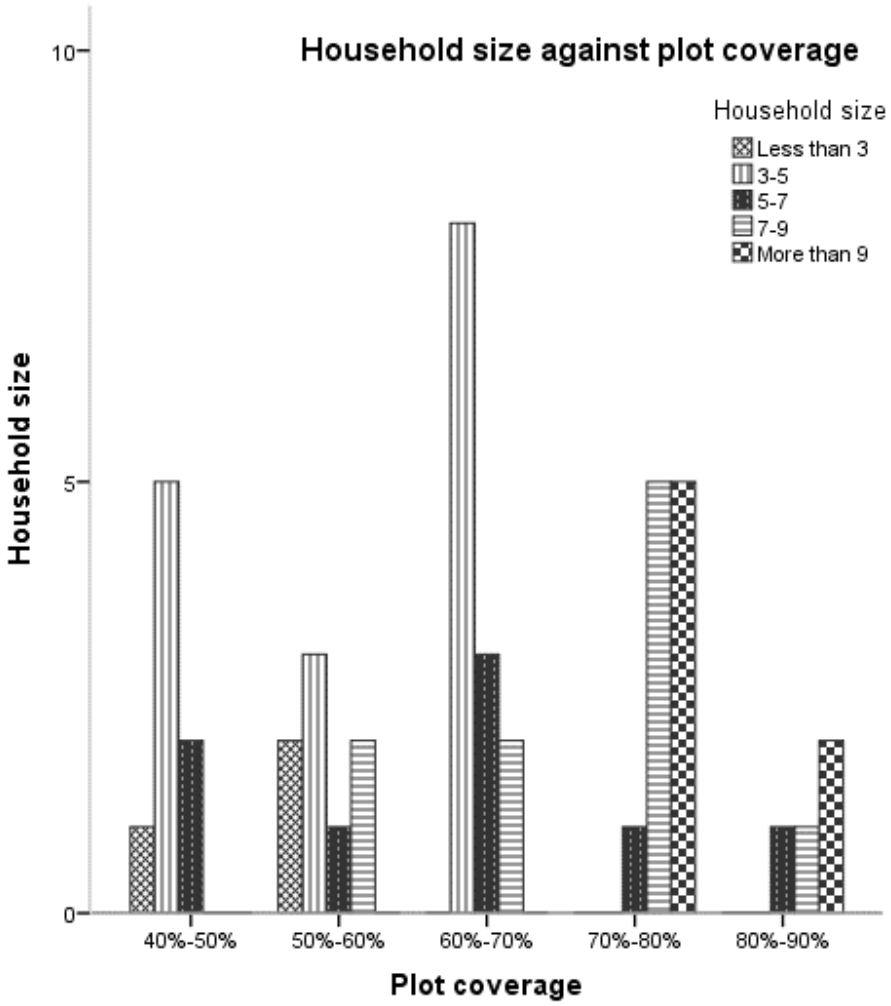


*Figure 2: Household size and compliance with plot coverage (Source: Fieldwork, September 2015)*

***Influence of household income on compliance with the minimum plot size***

There is compliance with the minimum plot size as all the plots conform to the stipulated minimum plot size of 350m$^2$ (Figure 3). Customary authorities thus allocate land in compliance with the minimum parcel sizes. Twenty-one (21) landholders who own more than 930 m$^2$ plots are in the GHS 500- GHS 1,000 income bracket. Pensioners aged above 60 years dominate this income group. Most purchased the plots with lump sum from their retirement benefits – in the 2000's, although they are currently earning between GHS500- GHS 1000. Others who currently earn below GH¢ 500 or GH¢ 500- GH¢ 1,000 have either inherited the land, received it as a gift or are indigenes. Furthermore, the arrangement of buying land when it's cheap and developing years later using the piecemeal method motivates all income groups to comply with plot sizes; otherwise they could not have afforded it now. Figure 3 thus suggests that income levels have little influence on parcel sizes.

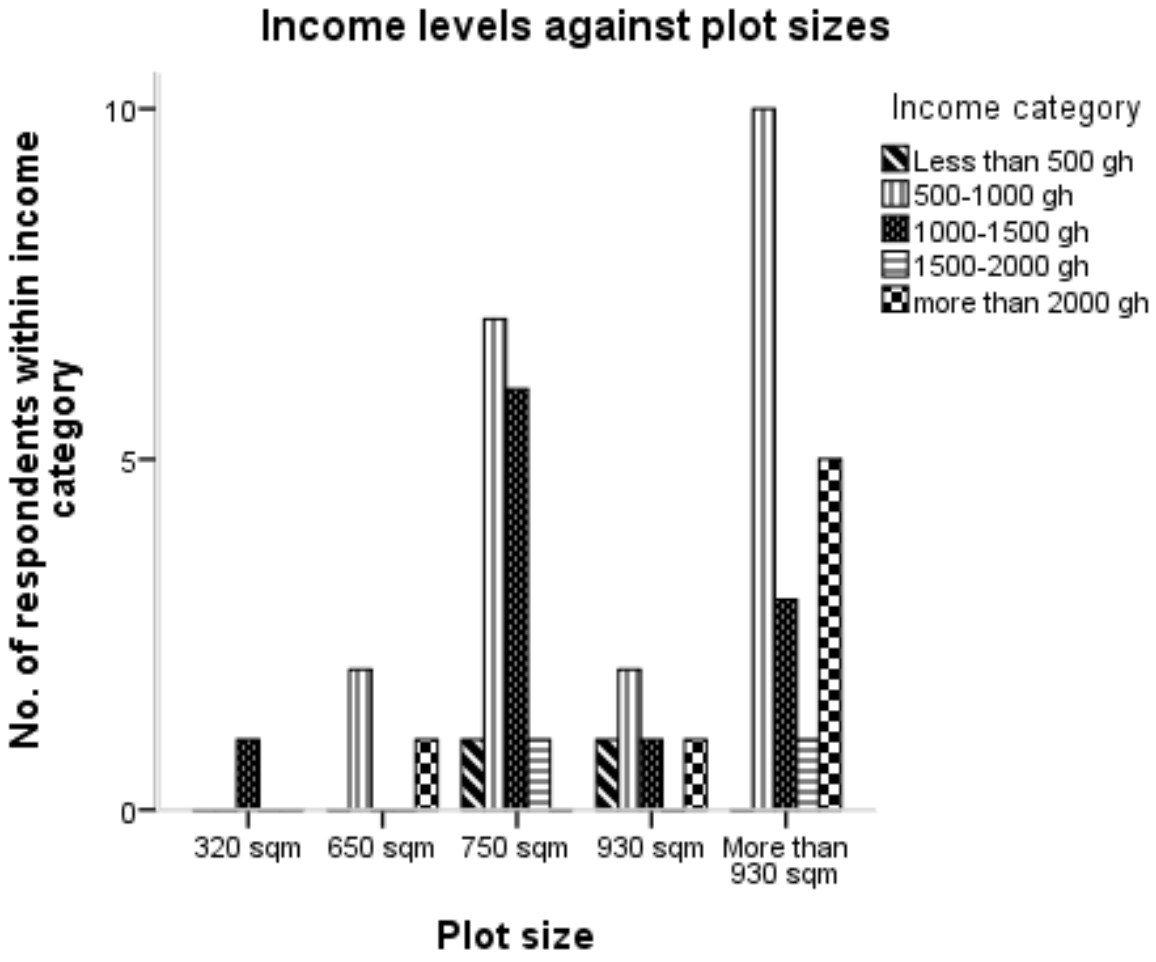


*Figure 3: Income in relation to plot size (Source: Fieldwork, September 2015)*

Two types of enforcement mechanisms exist: first, land right holders need to obtain a building permit (Local Government Act, 1993, Act 462). The permit process includes the verification of documents presented for a permit. A technical team which consist of the Planner, Works Engineer, Structural Engineers and representatives from Environmental Protection Agency and other departments inspect the application. Secondly, the Task Force Division of the Works Engineering Department monitors building sites to oversee that building permits have been acquired prior to erecting a building. Table 2 shows the stages of construction and type of penalties given if regulation standards are not adhered to. However, as noted by Kasanga and Kotey (2001), inadequate funding, inadequate skilled labour, mistrust between Assemblies and traditional authorities, friction between some established unit committees and traditional authorities affects the effectiveness of monitoring and enforcing regulations.

**Table 2.** Fines at each level of construction Adentan Municipal Assembly Fee Fixing Resolution, 2015

| Stage of Construction | Single Storey | | Multiple Storey Building | |
|---|---|---|---|---|
| | Fine (GH¢) | % Of Permit Fee | Fine (GH¢) | % of Permit Fee |
| Stage 1: Up to substructure | 300 | 50 % | 500 | 75 |
| Stage 2: Up to first floor slab | - | - | 600 | Actual Permit Fee |
| Stage 3: First floor and above | - | - | 700 | 1.5 of Permit Fees |
| Stage 4: Up to roofing | 400 | 75% | - | - |
| Stage 5; Roofing and Finishing | 500 | Actual Permit Fee | 1,000 | Twice Permit Fees |

***Influence of monitoring and enforcement on implementation of residential standards***

As shown in Table 3, majority (26) of landholders do not possess a building permit. Reasons for this include high cost, long process, lack of required documents, change of Municipality and the absence of task force. However, landholders possessed the indenture, which stipulates what the land is to be used for. The customary land authority confirmed this that while the indenture shows how the land should be used, they leave it to planning authorities to enforce the building standards. This suggests that enforcement of zoning regulation is strictly a government function.

**Table 3.** Number of respondents with building permits

| Description | No of respondents | % of respondents |
|---|---|---|
| Yes | 17 | 39 |
| No | 26 | 59 |
| No answer | 1 | 2 |
| Total | 44 | 100 |

Further, there is a low level of monitoring and enforcement of residential standards. Of the 44 respondents, 25 were never visited by the enforcement taskforce. According to the Planner and Works Engineer limited staff and logistics hinder the task force's ability to monitor and enforce the implementation. Hence, after issuance of building permit, the task force is unable to undertake the inspection visits as required due to logistical challenges and organization's limitations.

Nineteen respondents were visited by the monitoring and enforcement taskforce. Out of this number, 17 received penalty. The penalties are in the form of fines, written warnings and verbal warnings and in some cases seizure of construction tools -Figure 4. Penalties were issued because landholders began constructions without building permits. Three landholders were visited more than once.

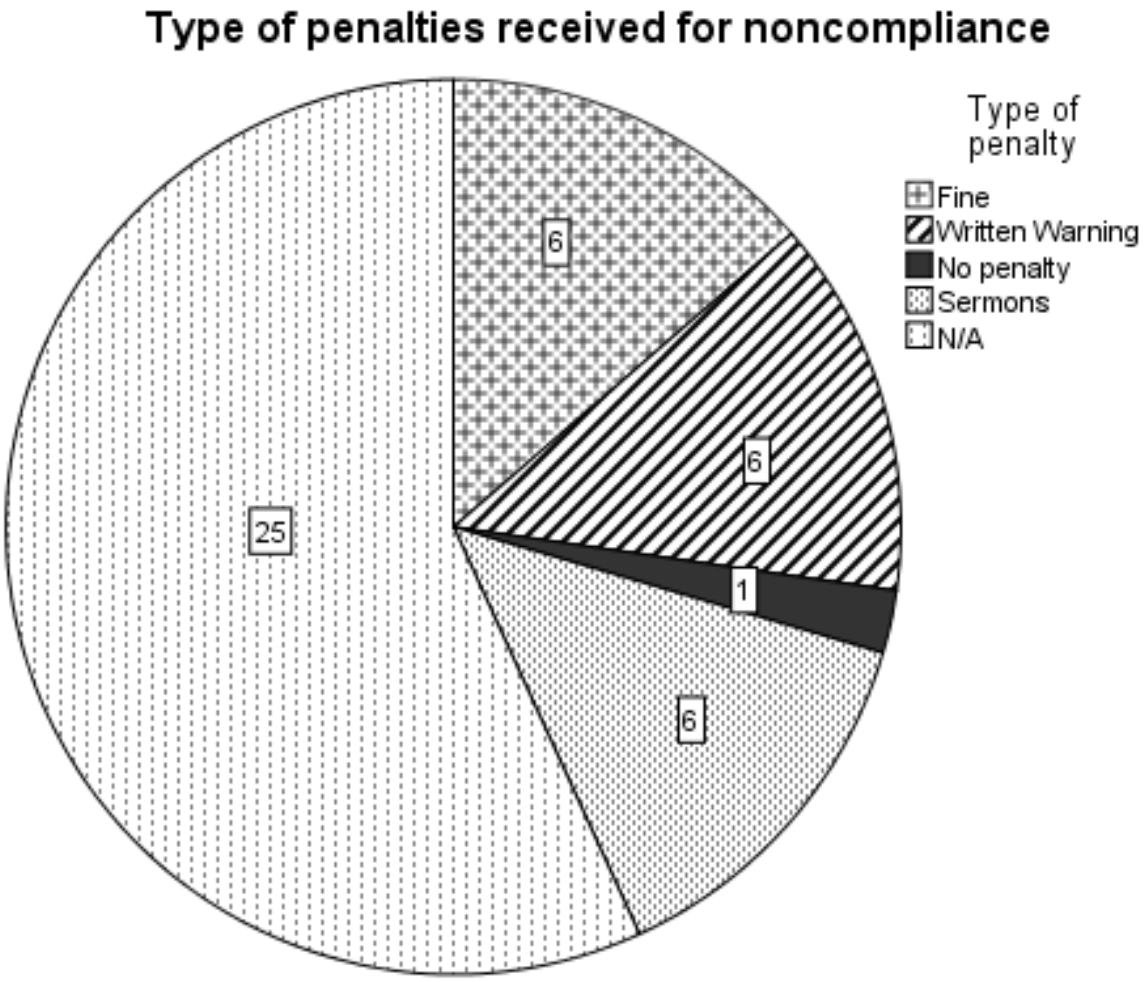


*Figure 4: Types of penalties received for noncompliance (Source: Fieldwork, September 2015)*

The penalties are light, according to the respondents. The planner indicates that harsher measures such as demolitions are limited to buildings blocking the right of way (road, utility) or waterway and not due to non-compliance. This suggests that land right holders may not be compelled to adhere to the residential standards even after receiving penalties. Moreover, respondents indicated that it is possible to regularize buildings at later stages. This has led to a practice of land right holders opting to regularize their buildings after receiving a penalty. This practice perhaps also encourages land right holders to flout on regulations.

**Effects of zoning regulations on the enjoyment of land rights in the context of customary tenure.**

Majority of respondents are confident of not losing their land rights due to non-compliance. Having obtained their *land* rights from the customary authorities, landholders believe the planning authority can only fine for non-compliance. Further, by registering their land rights (getting land title certificate from Lands Commission) respondents strengthen their land rights and security of tenure. According to the landholders, tenure insecurity can result from a lack of the title certificate and not from non-compliance. Thus, non-compliance to residential

standards has minimal interference on enjoyment of land rights.

***How land right holders defend themselves against the prescribed residential standards***

Landholders do not resist the residential standards perhaps due to lack of awareness and low enforcement by the planning authority. One landholder indicated taking legal action against the Municipality. Written false warnings on buildings have also been used as a mechanism by developers to prevent task force from visiting property. These false warnings e.g. 'stop work' notice gives the task force the perception that they have already visited the said property thereby evading penalties. Landholders (5) have also bribed the task force to avoid penalties.

**Spatial analysis to assess conformity and compliance with the local plan**

This section assesses conformity between reality of land uses and parcel sizes (derived from orthophoto from 2014) and the local plan. By overlaying the vector data extracted from the local plan over the orthophoto visual interpretation was performed to derive any changes. Figure 4 shows the general differences upon overlaying the vector data from the local plan and the orthophoto. On Figure 5, spatial compliance is visible concerning. i) Permitted uses i.e. residential area and ii) minimum plot size. However, four main types of spatial non-conformity between the local plan and orthophoto are identified:

i) Orientation of the parcel boundaries
ii) Shapes of plot boundaries
iii) Plot sizes
iv) Houses constructed on the border, or straddle parcel boundaries.

***Differences in the orientation of parcel boundaries***

A size reduced version of the images is used to present the results. Thus, a few of the 44 plots sampled for this study are used to elaborate on the changes observed between the orthophoto and the vector data extracted from the local plan. Figure 6 shows changes in the parcel boundaries as observed from the orthophoto and the local plan. Parcel 44 in Figure 6 shows a spatial misalignment between the local plan and as appears on the orthophoto by a whole right angle.

***Changes in shape of parcels***

Figure 6 also reveals the differences between parcel shapes on the local plan and on the orthophoto. All parcels sampled for this study do not spatially conform to the local plan. Figure 6 shows a few examples. Parcel 43, for example, suggests that according to the local plan, one plot exists on that space. However, the orthophoto shows that the plot has perhaps been subdivided into smaller plots. Boundaries of parcels adjustment to plot 43 also show discrepancies on the intended shapes of the plots compared to the orthophoto.

According to the family head, the proportion of family heads with maps/layout of the extent of their ownership is unknown. The family head interviewed added that customary authorities receive the layouts from the Municipality. However, they often allocate parcels based on their own discretion of where they think the boundary with the local plan layout lies. This may lead to a deviation on the parcels boundaries in reality and parcels depicted on the local plan. The Municipality may find it difficult to monitor spatial non-conformity especially when residents fail to obtain permits building permits for their plots. Further, the differences remain undetected as the zoning enforcement team rarely monitors this.

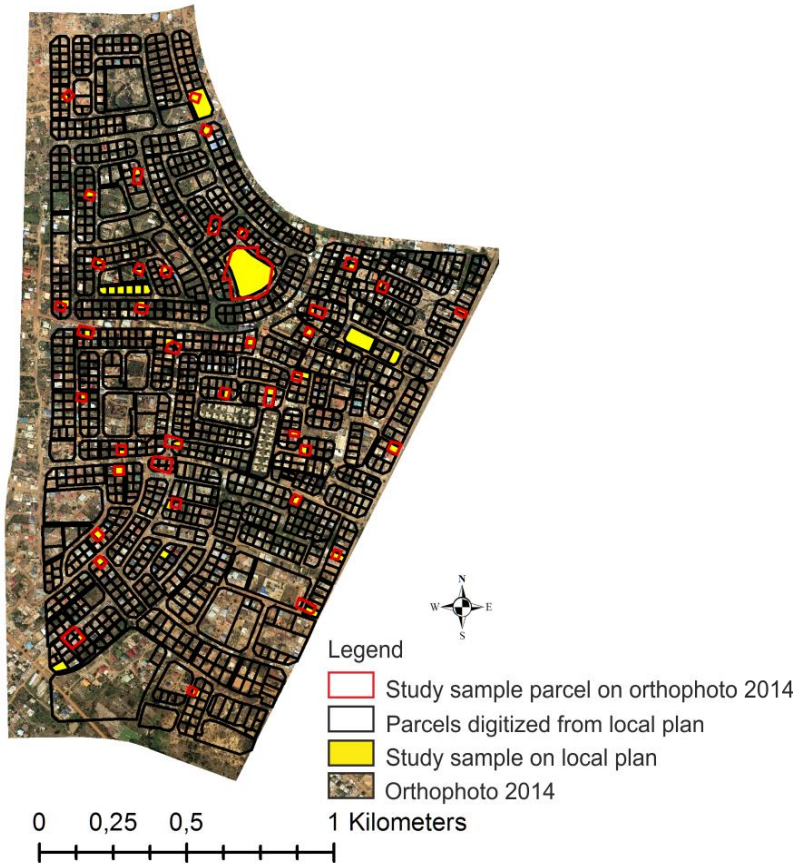


*Figure 5: Changes in orientation, shapes, and sizes of plots*

***Change in Plot sizes***

All plots conform to or are above the minimum parcel size. Areas (in size) are above the minimum standard (350m$^2$). Differences between the orthophoto and local plan suggest that changes in the plot sized have taken place. All parcels sampled for this study in Figure 6 confirm this. Changes in plot sizes result from subdivisions e.g. in parcel 3 or merging of plots e.g. on 43. According to the Municipal Planner, most of the subdivisions and merges are undertaken without approval from the Municipality. The Municipality finds this problematic as it defeats the purpose of the plan. Also, there is no restriction on how many parcels one can own as customary landowners are interested in receiving rent from the land. This situation further suggests that land right holders not affected by zoning standards as they can opt to subdivide or merge parcels by consulting customary authority instead of the Municipality.

***Building outside plot boundaries***

Figure 5 also reveals that buildings have been constructed outside the designated parcel/plot boundaries on the local plan. Buildings touch, across the boundary by the local plan, or are constructed on road reserves. Visual interpretation suggests live or other types of fences represent legitimate boundaries in use, indicating that the local plan has been thrown overboard. The planning authorities are aware of this problem. The Planner believes that there is about 50% compliance with residential standards; and about 30% conformity with parcel boundaries and planning with the local plan. The Planner believes that the spatial non-conformity is due to lack of corporation between custodians of land, Lands Commission and planners, lack of technical staff to monitor compliance and conformity, land litigations and the many number of family heads selling/leasing land. Planners have little influence where land is held under customary tenure as the allocation of land in reality differs from the local plan.

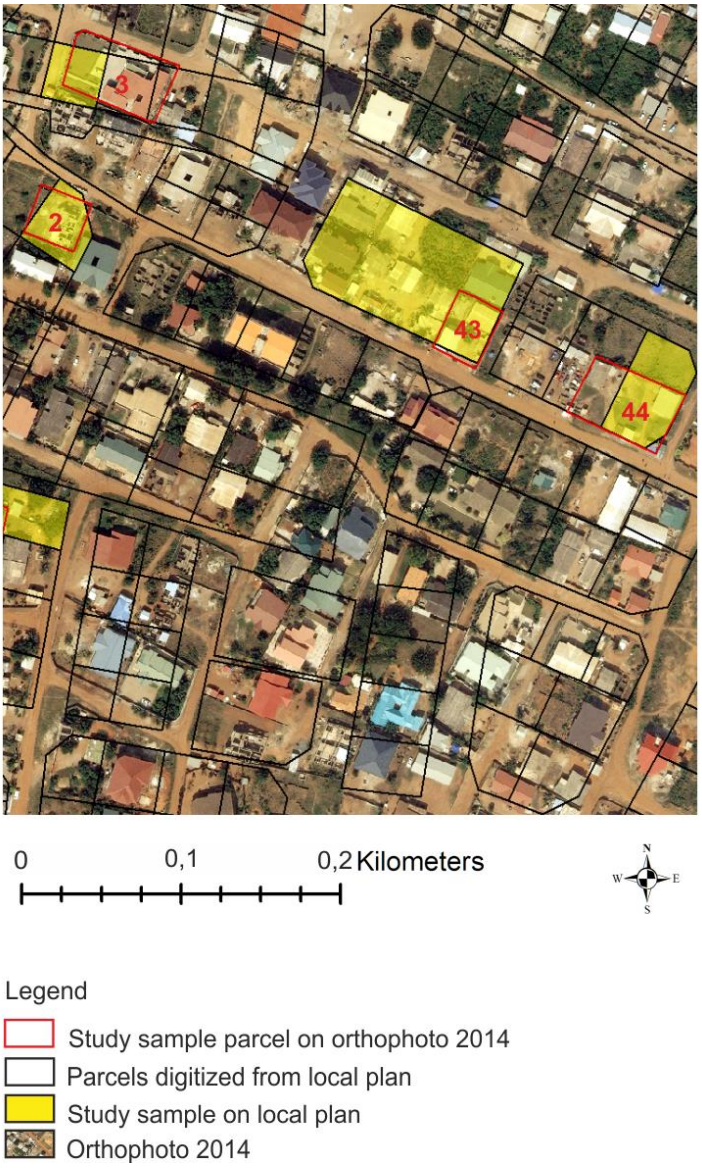


*Figure 6: Differences between digitized data from local plan and Orthophoto 2014*

## Discussion

### Factors influencing compliance

The study found out that lack of awareness of the zoning standards contribute to the non-compliance by land right holders. This study confirms Fuseini & Kemp, (2015) assertion that there is dearth of interaction between the multiple institutions dealing with land i.e. the customary land owners (on allocation of land rights), the Land Commission (on issuing title certificates) and Municipality (on issuing building permits). Lack of interaction between the multiple institutions dealing with land i.e. the customary land owners (on allocation of land rights), the Land Commission (on issuing title certificates) and Municipality (on issuing building permits) also contribute to the lack of awareness. Lack of awareness of the standards, household size, and need to generate income through rent contribute to non-compliance with the maximum plot coverage. Respondents of this study did not have clear procedure on where to get the information on the building standards. Lack of communication between the different authorities' means citizens are uninformed of what processes to follow and from which institution. Where opportunities were available e.g. through the Assembly representative, participation to the monthly meetings is optional. A synchronized procedure with the multiple institutions is perhaps needed to communicate the zoning standards, and emphasize its relevance. This confirms that the government and customary institutions do not work well together because their systems are not synchronized Fekade (2000). This study also shows that when citizens encounter with different institutions for different purposes, they learn to assert which institution is most relevant or poses most consequences to them. In this study, citizens revere customary authority (to access land rights) and the Lands Commission (to secure their tenure through a title certificate), and pay little attention to planning authority (on building standards). As noted by Boamah et al., (2012), planning authorities have to look for new ways to engage the public to participate in land use planning and enforcement of zoning regulations. There is the need to intensify and strengthen awareness through community programs and sensitization session.

Meanwhile, larger households call for more space. Demand for rental houses tempt land right holders to intentionally or unintentionally breach the maximum plot coverage. This result confirms Tipple's (2000) assertion that household size can negatively motivate use right holders to comply with standards such as maximum plot coverage. Low income also play a role in compliance with the plot coverage. The role of low income in compliance is twofold. Firstly, low income can serve as motivation for respondents to expand their houses or utilize their compound to earn income through rents thus exceeding maximum requirements and secondly, the costs of obtaining a building permit are often unaffordable by the low income earners, and the building standards may be burdensome, and this can negatively influence compliance (Dowall & Clarke, 1996; Fekade, 2000).

Findings show that enforcement has a positive influence on compliance with zoning regulation. Respondents who were visited by task force to check land use and compliance complied by getting permit to use land appropriately (Arimah & Adeagbo, 2000). The approach used by the Municipality is detecting violations and having them corrected. This is the only way as prevailing conditions in the study area such as multiple sale of land, land disputes, increasing demand for land and increment in land values do not allow use right holders to voluntary get permission to use land. Aspects of enforcement capacity such as staffing, technical expertise has an impact on compliance. Limitations in technical knowhow and number of staff, inadequate logistics makes it difficult for construction sites to be monitored at all stages of construction. It reduces the frequency of inspection carried out on ongoing construction works. There is therefore the need to increase capacity by adding better trained

personal not to only detect buildings without permit, properly review building plans for compliance with standards, but also inspection of construction with approved plans and detecting changes to approved plans.

To be able to properly enforce regulation, emphasis should be placed on equipping personnel to be able to detect violations and development without permit (Addai Boamah et al., 2012; Boamah, 2013; Fuseini & Kemp, 2015; Kuusaana & Eledi, 2015).

In this study the land right holders barely obtain a permit voluntarily because the process is circuitous, time-consuming and expensive. Logistical challenges affect monitoring and enforcement activities by the Municipality. This situation contributes to non-compliance as it creates conditions under which residents can violate zoning regulations (Burby et al. 1998). Burby adds that planners need to either improve their staff base and resources to detect or correct violations or create conditions under which violations are unlikely to occur. This study shows that the problem of non-compliance is exacerbated in the context of customary land tenure, where the customary land owners are concerned about earning rent rather than implementation of the zoning standards. Rukwaro (2009) observes that where enforcement by the planning authority is ineffective land owners can contravene the regulations with impunity. This also shows in this study.

**Effects on land rights**

Land right holders in a customary tenure setting do not risk losing their land rights due to non-compliance. In this study, respondents view their financial commitment to pay ground rent to the customary land owner and obtaining a title certificate from the Lands Commission is much more important. While building permits and zoning standards – (by the Municipality/planning authority) may be costly and cumbersome to obtain/implement, residents do not protest against this. Rather, residents have learnt trick to evade the prescribed zoning standards. Residents take advantage of the weak enforcement and light penalties by the planning authority and opt to regularize their buildings through a different permit – only after receiving a penalty from the planning authority. Regularization of buildings after completion implies that the planning authorities tolerate deviation from the zoning standards. Tanasesc et al (2010) observes the same in the context of formal land administration, where buildings deviant to the zoning regulations are considered illegal become accommodated in the mainstream policies. Toleration of deviation from the zoning standards happens when the government takes initiative to shift their policies and device approaches to regulate, rather than to demolish illegal structures or buildings not compliant to the zoning standards Tanasesc et al, (2010). As such, where property deviant to zoning regulations become accommodated in the mainstream policies, then the zoning standards have no effect on land right holders enjoying their land rights. However, there are cases where zoning regulation affects the land rights through evictions therefore loss of tenure security and consequently the loss of livelihoods as well (UN Habitat, 2008),

**Spatial conformity**

Land use planning is being spear-headed by customary land owners instead of the Town and Country planning department (Kuusaana & Eledi, 2015). The customary landowners and not the government take the decision as to which areas should be rezoned and subdivided or merged. This contradicts the Local Government Act 1993 (Act 462). This study notes the lack of cooperation between Municipality – planners and customary land owners. This does not only lead to unawareness of the required building standards by the residents, but ripples out to the spatial incompatibility between reality and the local plan. A total disregard of the plans by the customary authority and residents has left the planning authority being the only one concerned with the implementation of the building standards. Coupled with the inefficiencies

in monitoring and enforcement by the planning authority, results are dramatic deviations between the real world and local plans – as revealed in this study. Deviations range from contrasts in the orientation of the parcel boundaries; in the shapes of plot boundaries; houses constructed on the border, or straddle of parcel boundaries and differences in the plot sizes. However, compliance with residential standards is high, perhaps due to the area's proximity to the city of Accra and demand for residential houses. Studies show that zoning standards are challenging to implement in customary areas due to multiple interests held in the same land by different people – especially in the rural areas; and that the existing land tenure system in an area can affect how the zoning standards are received as planning institutions can find themselves being at the mercy of customary land owners to get a local plan effectively implemented (Yeboah & Obeng-Odoom, 2010).

This study suggests the need for the planning authority to find ways to improve efficiency and effectiveness on monitoring and enforcement of building regulations. The spatial analysis this study has proven the relevance of (GIS) for monitoring deviations with the local plan. GIS has become a significant tool to effectively monitor the zoning standards in the recent years (Talen, 1996). Unmanned Aerial Vehicles (UAVs) can help inspect/monitor properties and support the enforcement process quicker and cheaply. Application of such Geo-information tools and technologies in monitoring and enforcement can counteract logistical challenges associated with field patrols.

## Conclusion

This study assessed compliance of residential standards and if these have any effects on the enjoyment of land rights in the context of customary land tenure in Ghana. Results indicate that the planning authority does tolerate the deviations from the building standards by permitting completed buildings under a different permit. This suggests that certain regulations and standards are not capable of fulfilling their purpose in the face of challenges. The results have significance to land use planners. Much time and resources are put in to developing the local plans and defining regulations standards and enforcement mechanisms. These efforts are in vain when field visits are the main methods for monitoring and enforcing the zoning standards. This is worsened where logistical challenges hinder monitoring and enforcement activities. Changes observed by superimposing of the local plans of 2010 over the orthophotos of 2014 do not only illustrate waste of planner's time and money spent on preparing plans but also defeats the purpose of the plan and the aims. Unimplemented plans and standards also leads to loss of benefit to the general public. Ensuring conformity with plot boundaries calls for coordination between the planning authority and the customary authorities. In this study, synchronization of procedures and cooperation between responsible authorities i.e. the Municipality, customary authority and Lands Commission may help increase awareness and enhance implementation of the zoning standards. Further, tools like GIS, and lately using affordable acquisition techniques such as UAVs can enhance efficiency in monitoring and implementation of the zoning standards and address logistical challenges associated with field visits. There is therefore the need for frequent post-plan evaluation to avoid repetition of flaws. If this is not done, it may appear that non-conformity and non-compliance are acceptable to governments and not important to warrant strict enforcement.

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Open Access Journal

Book Review

# Robert A. Beauregard, Planning Matter: Acting with Things, University of Chicago Press, 2015; ISBN: 978-0-226-29739-2; 256 pp.

Marsko Marskamp
Institut de Géographie et Durabilité
Université de Lausanne, Lausanne Switzerland
Corresponding author: marko.marskamp@unil.ch



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In Planning Matter Robert Beauregard explores the contribution of actor-network theory (ANT) to the study and practice of planning. This is a difficult task since ANT is not a theory in the traditional sense, that can be applied to phenomena and render explanations. Perhaps, it is best described as a method that informs a relational understanding of specific situations. It is also a tricky task because it implies seeing a modern discipline through the lens of a literature that claims 'we have never been modern' (Latour, 1993). Beauregard (1989; 1991) has long grappled with the tension between post-modern theory and modern planning, and in this book, he concentrates on a non-modern challenge. Instead of a seemingly head-on collision (Chapter 1), the book describes a productive encounter that provides insight into planning's post-modern tensions. ANT can inspire planners '[to] become moral agents deeply entangled with the material world' (p. 226) and, in an unexpected manner, help modern planning to become relevant again today.

ANT is a body of work that emerged out of the 'science wars' between the perspectives of scientific realism and social constructionism in the late twentieth century. Sociologists of science formed a third position in this debate, describing the production of scientific knowledge as a negotiation between humans, technology and nature. Scientific facts, ANT scholars argued, are not discovered or constructed but carefully assembled through the association of social and material elements. More generally, in their view the world is made up of heterogeneous networks that are formed, negotiated and maintained in concrete sites of practice. To emphasize these two core tenets of the networked character of practice and the distributed character of agency, ANT has sometimes been called a sociology of circulation and translation (Callon, 1984). The central question, in the sense of translation, is not who

acts but how do some actors overcome the resistance of others to speak on their behalf in many places.

It is only recently that the relational and material considerations of ANT have found their way into the study of planning. The work of the geographer Jonathan Murdoch (2006) has been instrumental in this respect. Although some of the essays reproduced in Planning Matter have been at the forefront, the book is not the first to introduce ANT insights into planning. Rydin (2014) has indeed discussed ANT in connection with an unfolding material turn in planning theory. Boelens (2009), moreover, has explored some of the practical relevance of ANT for planning. Still, Planning Matter is a highly relevant and unique contribution to this debate. Inspired by ANT, its objective is to add to the history of planning a 'third materialism' that follows up on the 'naïve materialism' of early modern planners and the historical materialism of progressive planners in the 1970s. In this light, Beauregard's objective is to substitute the respective determinism and idealism of the latter with a pragmatism capable of fulfilling the 'promise of planning' (Chapter 9).

Consequently, Beauregard's goal is 'to craft an understanding of planning that brings theorists and practitioners closer to the material world they wish to change' (p. 3). He develops this understanding in eleven essays. Although they can be read independently, their connection is insightful. The essays are preceded by an introductory text which states the book's theoretical inspirations and its practical aspiration. Beauregard's reading of ANT is primarily influenced by the writings of Bruno Latour, and he explains that two of Latour's articles, on non-human agency (1992) and the role of critique (2004), have been particularly influential. The sequence of the essays reflects this influence, it shifts from an analytical interest in the symmetry between humans and nonhumans, to a pragmatic stance on the 'promise of the [planning] profession' (p. 113), understood as helping humans live well together with their environment. Overall, the book presents a well-crafted dialogue that introduces abstract concepts possibly new to some readers, and demonstrates their relevance in concrete planning situations. Readers familiar with ANT will find this dialogue interesting too since it still leaves room for readers to judge themselves the significance of ANT insights for planning.

In the opening essay, the conceptual starting point for the dialogue between ANT and planning is 'ontographies.' They are presented as lists that emphasize the many possible connections between the listed items more than their unitary coherence. Beauregard likens these lists to the open engagement of ANT, and in turn contrasts both to planning. This introduction of ANT by way of ontographies might be puzzling to readers new to its outlook, and surprising for those familiar with its attention to actual situations. Yet once they are fully discussed, the parallel with ANT becomes intelligible and their contrast to planning becomes apparent. Where ontographies and ANT emphasize heterogeneous, contingent and expansive entities, planning values order, coherence and completeness. Since 'An ontographic planner would be an oxymoron' (p. 31), Beauregard seems to prepare the reader for a confrontation. He nuances this though by stating that 'while planning is neither ontographic nor singular, the ways to do planning are many, but not unbounded' (p. 34). The extent to which ANT does provoke planning is the topic of the subsequent seven essays on talk, artefacts, sites, responsibilities, possibilities, obduracy and temporalities.

The essays develop an overall understanding of planning in terms of material actors and networked practices. Chapter 3 illustrates this well, highlighting how planning artefacts participate in planning deliberations and so shape planning action. This material agency is extended to the sites of planning practice in Chapter 4. Central to Chapter 2 and 5 through 8 is the thickening of planning networks as a function of the associations created through

discourse and practice, over time. As examples of theoretical concepts, this first set of essays relies on the existing planning literature. This means that the essays do not feature the kind of ethnographic work and thick-descriptions foregrounded by ANT. As a result, the essays are more illustrations of ANT insights based on planning examples than demonstrations of the ANT approach with case studies. This kind of 'bricolage' is also present in the conceptual vocabulary that draws on post-modern planning theory (Chapter 2 and 4), public ethics (Chapter 5), literary studies (Chapter 6), and political geography (Chapter 7).

Still, this theoretical and empirical assembling fits the purpose of the book and serves its arguments well. It makes for a very original and insightful re-consideration of some important planning debates. After all, Beauregard's aim is not to develop a new actor-network theory of planning but, as he notes, '[to] offer a sensibility, not a formal argument' (p. 10). In this way, one understands how, in a very atypical ANT fashion, Beauregard's approach can be 'unashamedly normative' (p. 11). His concern is not only the mattering of a planning theory, in terms of accounting for the material things, but also the mattering of a planning practice; which he claims to be 'diminished' in the United States (p. 172). Accordingly, the last three chapters are part of a second set of essays in which the descriptive mode of ANT is substituted for a prescriptive planning approach. That material things mediate planning practice is the central ANT inspiration in Chapter 9 on how planners find out the issues in need of planning attention. That action and reality take shape in networks is the basis for Chapter 10 on the role of planning scholars as public intellectuals.

The final chapter however, deviates from the latter ANT inspired suggestions with an essay entitled 'Planning will always be modern.' This essay will surprise those familiar with the non-modern character of ANT as well as the readers that followed the book's sequential order. After provoking planning with an ontographic and non-modern ANT lens, in this final chapter Beauregard revisits its main implications. He argues that the modern separation of humans and nonhumans, society and nature, politics and science is what has given and continues to give planning its legitimacy as an institutional practice. While planning and its 'promise' (Chapter 9) can benefit from engaging more with the material world, a non-modern mode of planning, according to Beauregard, will lose planning's modern response-ability of making places and lives better for humans.

This surprising conclusion deserves further reflection. A seminal ANT study describes how translation (as described above) is always transformation and sometimes even 'treason' (Callon, 1984). Planning Matter translates ANT concepts, carefully and craftily, in an attempt to speak on their behalf in the context of planning studies. That this can be tricky and possibly treacherous, is recognized by Beauregard: 'It might thus seem like intellectual suicide to reject one of his [Latour's] main tenets and now claim that city planning not only is still modern but is likely to always be so' (p. 213). Yet, he reminds us again that he is 'less interested in settling on truth (in the correspondence sense) than in exploring ideas and their limits' (p. 224). Still, it does seem that he attributes considerable resistance to planning in his translation. Specifically, he argues that '[The modernist] qualities of the planning profession cannot be changed without wholly erasing what we mean by planning' (p. 225). In a way, this does not set him apart from the progressive planners to whom his 'third materialism' is intended as a reply. They, and Beauregard himself, 'seem as reluctant as mainstream planners to shift planning away from its core activities' (p. 56).

Planning Matter is a significant contribution to a growing planning literature that seeks to add material things to planning deliberations that are usually considered the arena of humans only. It presents a careful consideration and clear illustrations of the opportunities and limitations of

seeing planning in a non-modern light. Moreover, it is comprehensive in offering an ANT view on the various dimensions of planning and ambitious in pushing this view into the realm of practice. As such, the book is a useful introduction of the main tenets of ANT into planning thought, and a primer for those interested in exploring the materiality of planning in their (doctoral) research. It is above all, a welcome contribution to the unfolding material turn in planning theory.

At the same time, the essays in this book are not ANT case studies and therefore do not demonstrate its distinct methodology. Once readers have taken an interest in the new directions Beauregard points at, they will need to follow up with other literature (see for example Murdoch, 2006; Latour, 2005). The provocations in the book are thus important pointers for further research on the mediating role of material things in planning. In particular, Beauregard's identification of the limits of ANT and the resistances of planning can be a productive starting point for future studies. It seems that Beauregard settles on a (modern) definition of planning early on in his essays (Chapter 2 and 6). In an ANT case study, Latour (2005) recommends, 'the task of explaining starts only after a profound suspicion has been introduced about the very existence of the objects accounted for' (p. 102). Accordingly, instead of trying to understand 'what planning is and is not' (p. 173), a potentially different definition of planning could emerge out of the ethnographic study of planning. Although this kind of research that traces the relations of 'obdurate' (p. 146) planning assemblages and their very definitions in actual practices is time consuming, it is also the kind that young academics have the luxury of doing.

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