DISS. ETH NO. 24151

LOCAL SPATIAL PLANNING IN THE FACE OF URBAN GROWTH: POLICIES AND PLANS IN SWISS MUNICIPALITIES

A thesis submitted to attain the degree of
DOCTOR OF SCIENCES of ETH ZURICH
(Dr. sc. ETH Zurich)

presented by
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2017

SUMMARY

The low-density expansion of urban areas increasingly influences land-use patterns in many regions of the world, including Switzerland. This phenomenon—often referred to as "urban sprawl"—reduces the amount of fertile soils, lowers the scenic beauty of traditional landscapes, and inflates the costs of mobility and infrastructures. In Switzerland spatial planning policy has been blamed for having failed to curb urban sprawl. However, systematic data on how municipalities try to steer their urban development is lacking, which limits the formulation of recommendations to improve the management of sprawl. This doctoral dissertation contributes to tackling this issue by focusing on planning evaluation and assessing the policies and plans that Swiss municipalities have applied to accommodate urban growth in recent decades.

The first paper of this thesis evaluates whether Swiss municipalities appropriately combine land-use regulations (e.g., minimum utilization densities) with other policies, implemented through economic incentives (e.g., density bonuses), in order to steer their urban development. In fact previous studies have concluded that diversified growth-management approaches, which build on a wide range of reinforcing policies, are key to manage urban growth efficiently. For this purpose, a questionnaire was addressed to local planning officers to assess the prevalence and the time of introduction of 18 growth-management policies. The study showed that growth-management approaches vary widely from small to large municipalities, with large and very large municipalities using more diversified approaches and more economic incentives than their smaller counterparts. However, the study also revealed that smaller municipalities have started diversifying their growth-management approaches since 2010, in parallel with a recent evolution of the planning context calling for urban densification instead of greenfield development. In addition, the analysis also clearly demonstrated that smaller municipalities have significantly less in-house planning staff in their administrations than large municipalities, which might limit their ability to apply innovative growth-management approaches.

The second and third papers focus on a specific municipal plan applied throughout Switzerland to manage urban growth: the local plan (*kommunaler Richtplan/plan directeur communal*). Local plans aim to steer local spatial development by setting long-term development goals as well as policies and strategies to reach these goals. Several cantonal governments impose planning mandates, i.e. they request municipalities to develop local plans. However, the quality and implementation of these plans has never been systematically assessed, and it is unclear whether cantonal planning mandates have an influence on the quality and implementation of local plans.

The second paper of this dissertation addresses these issues with a multi-method approach combining content analysis of local plans, interviews with cantonal planning officers, and questionnaires addressed to local planning officers. Overall, the analysis revealed that planning mandates only have a limited impact on the quality of local plans and on the implementation of policies. The study also showed that many local plans lack clear implementation and monitoring provisions, which might lower their ability to guide urban development. In fact, such provisions are crucial to ensure that policies are actually applied in an appropriate and timely manner. To increase the quality of local plans, cantonal governments could set clearer goals and more precise requirements regarding the content of the plans. In particular, they could require municipalities to include detailed implementation provisions and assemble them into an action plan.

In the third paper, an innovative method is developed to evaluate plan quality and implementation while accounting for the specificities of local plans. In addition, this paper assesses whether plans of high quality are better implemented than plans of lower quality – a topic neglected so far in scientific literature. The approach developed in this article is well-embedded within existing theoretical concepts and analytical procedures of plan evaluation (i.e., performance and conformance approaches) but its application does not require complex technical skills. As a result, it provides an innovative and transparent scheme that could be easily used by planners to improve future plan-making processes and systematically assess the quality of their plans. The approach was applied to a set of Swiss local plans and revealed that most local planning officers value their plans, use them in daily planning practice, and are committed to implementing them. These findings are very encouraging and contradict assertions commonly found in the planning literature, which suggest that local plans tend to be disregarded by local planners. Most importantly, and for the first time in Switzerland, the analysis confirmed the benefit of high-quality plans since local officers perceived their plans as more useful when they were of good quality.

Overall, this doctoral thesis shows for the first time how wide a range of growth-management policies are used by Swiss municipalities, and it develops innovative methods to assess the quality and implementation of local plans. In the course of the dissertation, it became clear that the application of growth-management policies and plans is often constrained by the lack of professional know-how and the limited planning capacity of local governments. Small and medium-sized municipalities in particular tend to be overwhelmed by the complexity of current planning challenges and encounter difficulties to promote more infill development and less land consumption. In light of these observations, it appears crucial to increase the planning capacity and the professionalization of local governments, and to guide them during the development and the application of growth-management policies. The data collected in the context of this thesis on growth-management policies and their application over the past decades are unique and provide a solid basis to inform future policy efforts.

Future studies could use these data in combination with GIS analyses to evaluate whether municipalities applying diversified growth-management approaches (e.g., land-use regulations and innovative policies implemented through economic incentives) are more successful at increasing building densities and reducing urban expansion. Alternatively, the findings drawn from this thesis could help decision-makers investigating how to improve policies and adapt them to the challenges faced by small and medium-sized municipalities. Furthermore the approach developed in the third paper could be used to identify examples of best-practice local plans and help municipalities improve the quality of their plans.

ZUSAMMENFASSUNG

Die Ausdehnung von Gebieten mit geringer Wohndichte beeinflusst zunehmend die Flächennutzung in vielen Regionen auf der Welt, inklusive der Schweiz. Dieses Phänomen – auch als Zersiedlung bezeichnet – vermindert nicht nur die Fläche fruchtbarer Böden und die Ästhetik traditioneller Landschaften, sondern steigert zudem die Kosten für Mobilität und Infrastruktur. In der Schweiz wird der Raumplanung vorgeworfen, die Zersiedlung nicht erfolgreich einzudämmen. Für eine eingehende Beurteilung dessen fehlt es jedoch an systematisch erhobenen Daten über die Steuerung der Siedlungsentwicklung auf kommunaler Ebene. Das Fehlen solcher Daten limitiert die Erarbeitung von konkreten Empfehlungen zur besseren Eindämmung der Zersiedlung. Zur Bewältigung der genannten Probleme und Herausforderungen werden diese in der vorliegenden Doktorarbeit näher betrachtet. Das Ziel ist die Beurteilung der raumplanerischen Massnahmen und Pläne, welche die Schweizer Gemeinden genutzt haben, um das Wachstum der Siedlungen in den vergangenen Jahrzehnten zu steuern.

Die erste Publikation in dieser Arbeit evaluiert, inwiefern die Schweizer Gemeinden unterschiedliche Massnahmen gleichzeitig einsetzen zur Steuerung der Siedlungsentwicklung, beispielsweise eine Kombination aus hoheitlich planerischen Instrumenten (z.B. Mindestausnützungsziffern) und anreizorientierten Massnahmen (z.B. Dichtebonus). Bisherige Studien haben aufgezeigt, dass Strategien zur Steuerung der Siedlungsentwicklung auf einer Vielzahl von ergänzenden Massnahmen basieren sollten, um Siedlungswachstum effizient zu steuern. In der hier vorliegenden Studie wurde ein Fragebogen entwickelt zur Befragung der kommunalen Planungsbeamten bezüglich dem Einsatz und Einsatzzeitpunkt von 18 raumplanerischen Massnahmen. Diese Studie hat belegt, dass die Kombinationen von Massnahmen stark variieren zwischen kleinen und grossen Gemeinden. Im Vergleich zu den kleineren Gemeinden, nutzen grosse bis sehr grosse Gemeinden eine größere Vielfalt unterschiedlicher Massnahmen sowie mehr anreizorientierte Massnahmen. Allerdings hat die Studie auch gezeigt, dass kleinere Gemeinden begonnen haben ihre Massnahmen zu diversifizieren seit ca. 2010. Dies erfolgte gleichzeitig mit einer grundlegenden Veränderung (weg von dem Grüne-Wiese Ansatz hin zu stärkerer Verdichtung) in der Raumplanung. Zudem konnte anhand der Studie belegt werden, dass kleinere Gemeinden signifikant weniger Planungskapazität haben als grosse Gemeinden, was ihre Fähigkeit zur Umsetzung von innovativen Massnahmen beeinträchtigen kann.

In der zweiten und dritten Publikation liegt der Fokus auf dem kommunalen Richtplan, welcher in der gesamten Schweiz angewendet wird. Ziel des kommunalen Richplanes ist die Steuerung der kommunalen Siedlungsentwicklung, indem langfristige Entwicklungsziele, Massnahmen und Strategien definiert werden. In mehreren Kantonen werden kommunale Richtpläne vorgeschrieben, d.h. dass Gemeinden einen kommunalen Richtplan entwickeln müssen. Die Qualität und Umsetzung dieser Pläne wurde bisher nicht systematisch evaluiert. Zudem ist nicht bekannt, ob kantonale Planungsmandate einen Einfluss auf die Qualität und Umsetzung der kommunalen Richtpläne haben.

In der zweiten Publikation wird die eingangs dargestellte Problematik unter Anwendung eines *"multimethod"* Ansatzes betrachtet, indem eine Inhaltsanalyse von kommunalen Richtplänen ergänzt wird durch Experteninterviews und Ergebnissen einer Befragung anhand von Fragebögen. Die Analysen haben gezeigt, dass Planungsmandate nur einen beschränken Einfluss auf die Qualität der kommunalen Richtpläne sowie auf die Umsetzung der Massnahmen haben. Zudem hat die Studie gezeigt, dass es vielen kommunalen Richtplänen an klar definierten Umsetzungs- und Überwachungsmassnahmen mangelt, was möglicherweise deren Fähigkeit mindert, die Siedlungsentwicklung zu steuern. Klar definierte Umsetzungs- und Überwachungsmassnahmen erwiesen sich als entscheidend für eine angemessene und fristgerechte Umsetzung. Eine Verbesserung der kommunalen Richtpläne könnte erreicht werden, wenn kantonale Regierungen die Ziele klarer formulieren und die Voraussetzungen in Bezug auf den Inhalt der Pläne präziser definieren würden. Eine Möglichkeit wäre beispielsweise die Gemeinden zu veranlassen, detaillierte Umsetzungsvorschriften in einem Massnahmenplan zusammenzustellen.

Im Rahmen der dritten Veröffentlichung wurde eine innovative Methode entwickelt zur Evaluation der Qualität und Umsetzung der Pläne, unter Berücksichtigung ihrer Genauigkeit. Zudem wird beurteilt, ob Pläne von höherer Qualität besser umgesetzt werden als Pläne von geringerer Qualität – ein Thema welches bisher vernachlässigt wurde in der wissenschaftlichen Literatur. Der in dieser Veröffentlichung entwickelte Ansatz ist gut eingebunden in bereits existierende theoretische Konzepte und analytische Vorgehensweise der Planevaluierung (d.h. "*conformance*" und „*performance*"). Dieser Ansatz ist, im Gegensatz zu den bereits existierenden, einfach in der Umsetzung und bedarf daher keinen komplexen, technischen Fähigkeiten. Das hier entwickelte innovative und transparente Verfahren kann leicht von Planern genutzt werden, um zukünftige Planungsprozesse zu verbessern. Zudem eignet es sich für die systematische Bewertung der Qualität dieser Pläne. Basierend auf diesem Ansatz wurden mehrere schweizerische kommunale Richtpläne analysiert, mit dem Ergebnis, dass ein Grossteil der kommunalen Planungsbeamten ihre Richtpläne schätzen, diese bei der täglichen Planung nutzen, und sich verpflichten diese umzusetzen. Diese Ergebnisse sind äusserst erfreulich und widersprechen allgemein gültigen Aussagen in der Planungsliteratur, wonach kommunale Richtpläne von kommunalen Planern in der Regel nicht berücksichtigt werden. Die Analyse bestätigt einerseits den Nutzen von qualitativ hochwertigen Plänen und andererseits die Tatsache, dass kommunale Beamte die Pläne als nützlicher erachten, wenn sie von guter Qualität sind.

Zusammenfassend kann festgehalten werden, dass im Rahmen dieser Doktorarbeit zum ersten Mal aufgezeigt werden konnte, wie eine Vielzahl von Massnahmen zur Steuerung der Siedlungsentwicklung von Schweizer Gemeinden genutzt wird. Zudem wurden innovative Methoden zur Beurteilung der Qualität und Umsetzung von kommunalen Richtplänen entwickelt. Im Rahmen der Doktorarbeit konnte nachgewiesen werden, dass die Umsetzung raumplanerischer Massnahmen und Plänen beeinträchtigt wird durch mangelndes Fachwissen und begrenzter Planungskapazität der Gemeinden. Besonders kleine bis mittelgrosse Gemeinden scheinen oftmals überfordert von der Komplexität der aktuellen Planungsherausforderungen. Dies trägt dazu bei, dass die Förderung einer höheren Verdichtung mit geringerem Flächenverbrauch erschwert wird. In Anbetracht dieser Ergebnisse scheinen eine Erhöhung der Planungskapazitäten durch zusätzliche Fachkräfte sowie die Weiterbildung der kommunalen Planungsverantwortlichen unumgänglich zu sein.

Des Weiteren ist eine Unterstützung bei der Entwicklung und Umsetzung von raumplanerischen Massnahmen zur Steuerung der Siedlungsentwicklung essentiell. Die im Rahmen dieser Arbeit systematisch gesammelten Daten sind einmalig und bieten eine solide Basis für die Verbesserung und Entwicklung zukünftiger Massnahmen.

Zukünftige Studien können diese aufwendig gesammelten und aufbereiteten Daten nutzen, um beispielsweise anhand von GIS-Analysen die Umsetzung vielfältiger Massnahmen zu evaluieren, welche dazu beitragen die Bebauungsdichte zu erhöhen und gleichzeitig eine weitere Ausdehnung der urbanen Gebiete einzudämmen. In der Praxis sind diese Daten und Erkenntnisse besonders für Entscheidungsträger von Bedeutung, deren Ziel die bessere Anpassung von Massnahmen an aktuelle Herausforderungen der kleinen bis mittelgrossen Gemeinden ist. Des Weiteren kann der in der dritten Veröffentlichung entwickelte Ansatz genutzt werden, um die besten kommunalen Richtpläne zu identifizieren und Gemeinden zu helfen, deren Pläne zu verbessern.

RÉSUMÉ

L'expansion des zones urbaines se poursuit en entraînant des répercussions dans de nombreuses régions du globe, y compris en Suisse. Ce phénomène, souvent qualifié d' « étalement urbain », réduit considérablement l'étendue des terres agricoles, modifie l'esthétique des paysages traditionnels et impose d'importants coûts économiques liés à l'augmentation de la mobilité et des frais d'infrastructure. En Suisse, l'aménagement du territoire a été accusé ces dernières années de ne pas limiter l'étalement urbain de manière efficace. Paradoxalement, il n'existe pas de données systématiques sur les mesures mises en place par les communes afin de gérer leur développement urbain. Dans ces conditions, il est difficile de formuler des recommandations concrètes pour limiter l'étalement urbain au niveau communal. Cette thèse de doctorat contribue à combler ces lacunes en étudiant les instruments et les plans utilisés depuis plusieurs décennies par les communes afin de contrôler leur développement.

Le premier article évalue dans quelle mesure les communes suisses combinent de manière appropriée des mesures d'affectation du sol traditionnelles (p. ex. indice d'utilisation du sol minimal) avec d'autres instruments mis en œuvre à l'aide de mécanismes d'incitation économique (p. ex. taxation de la plus-value). En effet, de précédentes études ont démontré qu'une approche diversifiée reposant sur différents types d'instruments est indispensable à une gestion efficace du développement urbain. Pour explorer cette question, un questionnaire a été envoyé aux responsables communaux de l'aménagement du territoire afin d'étudier l'utilisation et la date d'introduction de dix-huit mesures d'aménagement. L'étude démontre que les instruments mis en place varient fortement en fonction de la taille des communes. Celles de grande taille utilisent des approches plus diversifiées et ont plus souvent recours à des mécanismes d'incitation économique que leurs homologues de plus petite taille. Cependant, les résultats révèlent que les petites communes ont également commencé à diversifier leurs instruments depuis 2010, parallèlement à une récente évolution du contexte politique encourageant l'urbanisation vers l'intérieur. De plus, l'analyse montre clairement que les petites communes possèdent peu d'aménagistes qualifiés au sein de leur administration, ce qui semble limiter leur capacité à appliquer des approches innovantes et diversifiées en matière de développement urbain.

Les deuxième et troisième articles portent sur un type d'instrument largement appliqué en Suisse et obligatoire dans de nombreux cantons: les plans directeurs communaux. Ceux-ci visent à influencer le développement urbain en formulant des objectifs à long terme et en identifiant des mesures et des stratégies appropriées pour les atteindre. Cependant, la qualité et la mise en œuvre de ces plans n'ont jamais été évaluées systématiquement, et aucune donnée ne permet de déterminer si les plans directeurs sont de meilleure qualité dans les cantons qui les prescrivent ou dans ceux où ils sont facultatifs.

Le deuxième article aborde ces questions au travers d'une approche multi-méthode combinant analyses détaillées de plans directeurs communaux, entretiens avec des responsables cantonaux et questionnaires adressés aux responsables communaux. Dans l'ensemble, l'analyse révèle que la qualité et la mise en œuvre des plans directeurs communaux varient faiblement entre les cantons où ils sont prescrits et ceux où ils sont facultatifs. En outre, elle démontre que les plans contiennent souvent trop peu de prescriptions relatives à leur mise en œuvre et à leur évaluation, ce qui limite leur capacité à guider le développement urbain de manière efficace. En effet, de telles prescriptions sont cruciales pour garantir une mise en œuvre appropriée et selon un calendrier adéquat des

mesures d'aménagement spécifiées dans les plans directeurs. Dans le but d'améliorer la qualité des plans développés dans leur juridiction, les responsables cantonaux pourraient édicter des directives au contenu plus précis. Notamment, ils pourraient encourager les collectivités locales à inclure des prescriptions de mise en œuvre détaillées pour chaque mesure d'aménagement, et à les assembler sous la forme d'un catalogue.

Le troisième article présente une nouvelle méthode qui permet d'évaluer la qualité et la mise en œuvre des plans directeurs communaux. De plus, il explore dans quelle mesure la qualité des plans directeurs influence leur mise en œuvre. L'approche méthodologique proposée est bien intégrée dans les concepts théoriques et les procédures analytiques citées dans la littérature scientifique (approches de *performance* et de *conformance*), et son application est aisée et transparente. En conséquence, elle se prête à une utilisation par des professionnels de l'urbanisme. Ceux-ci pourraient l'appliquer pour améliorer les processus de planification et pour évaluer systématiquement la qualité des plans déjà développés. Dans le cadre de la présente thèse, cette méthode a été utilisée afin de juger la qualité et l'utilisation des plans directeurs d'une quarantaine de communes. L'analyse démontre que la majorité des responsables communaux accordent de l'importance à leurs plans, les utilisent régulièrement et s'attachent à mettre en œuvre les mesures d'aménagement qu'ils prescrivent. Ces conclusions sont réjouissantes et contredisent certaines assertions communément rencontrées dans la littérature, selon lesquelles les plans directeurs tendent à être peu utilisés ou même ignorés par les responsables communaux. Pour la première fois en Suisse, l'analyse permet également de confirmer que l'utilisation des plans directeurs est étroitement liée à leur qualité. En effet, les plans de bonne qualité ont été jugés plus utiles par les responsables communaux contactés.

Dans l'ensemble, cette thèse de doctorat présente - pour la première fois - des données quantitatives et à large échelle sur les instruments d'aménagement utilisés par les communes suisses. De plus, elle propose une méthode innovante pour évaluer de manière systématique la qualité et la mise en œuvre des plans directeurs communaux. Au cours du projet, il est apparu clairement que l'utilisation des plans et des instruments d'aménagements est souvent limitée par le manque de moyens et la faible professionnalisation de certaines administrations communales. Les petites communes en particulier sont souvent dépassées par la complexité des enjeux actuels de l'aménagement du territoire et rencontrent des difficultés à promouvoir un développement urbain vers l'intérieur. Compte tenu de ces observations, il apparaît crucial de renforcer la professionnalisation et d'augmenter les moyens mis à disposition des administrations communales, et de les guider durant le développement et l'application des mesures d'aménagement. Dans ce contexte, les données collectées dans le cadre de cette thèse fournissent une base solide pour informer les processus de planification territoriale dans le futur.

D'autres études pourraient utiliser les données collectées en parallèle à des analyses SIG afin d'évaluer dans quelle proportion les communes qui combinent différents types de mesures d'aménagement (p. ex. mesures d'affectation du sol et mesures mises en œuvre par des mécanismes d'incitation économique) sont mieux à même de promouvoir la densification urbaine et de réduire l'étalement urbain. En complément, les résultats obtenus dans le cadre de cette thèse sont susceptibles d'aider les responsables politiques et administratifs à améliorer et adapter les politiques publiques de l'aménagement du territoire aux défis rencontrés par les communes de petite taille. Pour terminer, l'approche méthodologique développée dans le troisième article

pourrait permettre d'identifier des exemples concrets de plans directeurs de bonne qualité afin d'aider les responsables communaux à améliorer leurs plans.

GLOSSARY

English	German	French
Building code; building ordinance	Baureglement	Règlement d'affectation
Building permit	Baubewilligung	Permis de construire
Building zone	Bauzone	Zone à bâtir
Cantonal comprehensive plan	Kantonaler Richtplan	Plan directeur cantonal
Comprehensive plan	Gesamtrichtplan	Plan directeur
Concept of development	Entwicklungskonzept	Concept de développement
Conservation zone to limit urban extension	Freihaltezone	Zone à maintenir libre de toute construction
Density bonus	Dichtebonus	Bonus de densité
Federal law on spatial planning	Bundesgesetz über die Raumplanung (RPG)	Loi fédérale sur l'aménagement du territoire (LAT)
Growth-management policy	Raumplanerische Massnahme	Mesure d'aménagement du territoire
Increase in maximum utilization densities	Heraufsetzung der Nutzungsziffer	Rehaussement des indices d'utilisation du sol
Inventories of urban densification potentials	Evaluation der Verdichtungspotenziale	Évaluation du potentiel de densification du milieu urbain
Land hoarding	Baulandhortung	Thésaurisation des terrains à bâtir
Land readjustment	Landumlegung	Remaniement parcellaire
Land use	Landnutzung	Utilisation du sol
Land use plan	Nutzungsplan	Plan d'affectation du sol
Land-use regulations	Hoheitliche raumplanerische Massnahmen	Mesures d'affectation du sol traditionnelles
Local plan	Kommunaler Richtplan	Plan directeur communal
Masterplan	Masterplan	Masterplan
Minimum utilization densities	Minimale Nutzungsziffer	Indices d'utilisation du sol minimaux
Municipal merger	Gemeindefusion	Fusion de communes
Phased development	Etappierung der Bebauung	Développement du milieu bâti par étapes
Planning officer	Planungsbeamte	Fonctionnaire en charge de l'urbanisme
Private planning office	Privates Planungsbüro	Bureau de planification privé
Programme for the qualitative enhancement of new development projects	Programm zur Verbesserung der städteplanerischen Qualität neuer Bauprojekte	Programme pour l'amélioration de la qualité urbanistique des nouveaux projets de construction
Programme for the redevelopment of existing urban areas	Programm zur Renovation und strukturellen Verbesserung schon bestehender Bausubstanz	Programme pour la rénovation et l'amélioration de la structure du milieu bâti déjà existant
Public acquisition of land	Rückkauf von privatem Bauland	Achat public de terrains à des propriétaires fonciers privés
Reclassification (rezoning) into non-building zone	Rückzonung	Déclassement d'une zone à bâtir
Reserve of undeveloped building zones	Bauzonenreserve	Réserve de zones à bâtir
Settlement area / urban area	Siedlungsgebiet /Bebautes Gebiet	Zone urbaine / zone construite
Single-purpose local plan	Teilrichtplan	Plan directeur sectoriel
Spatial planning	Raumplanung	Aménagement du territoire
Spatial planning guidelines	Leitbild	Conception directrice
Special district plan	Sondernutzungsplan	Plan d'affectation spécial
Taxing added value	Mehrwertausgleich	Système de prélèvement de la plus-value

Upzoning	Aufzonung	Modification de l'affectation d'une zone à bâtir afin d'augmenter sa densité d'utilisation
Urban development	Siedlungsentwicklung	Développement urbain
Urban growth	Siedlungswachstum	Croissance urbaine
Urban sprawl	Zersiedelung	Étalement urbain

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CHAPTER 1: INTRODUCTION

1.1. General context: urban growth and urban sprawl

Urban growth has dramatically influenced land-use patterns in most regions of the world over the past two centuries, and occurs at a rapid pace (Bhatta, 2010). In Switzerland, for example, more land area was taken up for settlement and transport development between 1950 and 2000 than during the 10 000 years prior to 1950 (Jaeger, 2002, as cited in Jaeger, Bertiller, Schwick, & Kienast, 2010). This trend is expected to continue in the future (United Nations Population Fund, 2007; The World Bank, 2005) and the amount of built-up areas covered by cities on Earth's surface could increase by 1 200 000 km^2 up to 2030 (Seto, Güneralp, & Hutyra, 2012), an area equivalent to roughly 30 times the total land surface of Switzerland.

Under the pressure of urban growth, the Swiss landscape has undergone important transformations during the course of the past three decades. Land use statistics reveal that between 1985 and 2009, settlement and infrastructure areas increased by 23.4%, leading to the conversion of 584 km^2 of open land into newly built-up areas, a surface larger than the total area covered by Lake Geneva (SFSO, 2015). In the meantime, roughly 1 m^2 of agricultural land disappears every second (SFSO, 2013). Most importantly, the mean surface of built-up area per capita has increased continuously to reach 407 m^2 per inhabitant in 2009 (SFSO, 2013), exceeding the target of 400 m^2 per inhabitant set by the Swiss Federal Council to ensure the economical use of land (Swiss Federal Council, 2012). In fact, urban growth in Switzerland has been dominated for several decades by the low-density expansion of urban areas, a phenomenon known as urban sprawl. Urban development has been dispersed and open landscapes situated in-between cities and villages have become permeated by built-up areas. Consequently, urban sprawl is currently not restricted to the country's main urban centres such as Zurich or Geneva, but also affects suburban and traditionally rural areas (Mann, 2009).

Despite the fact that sprawled areas are among the most sought-after residential zones, due to their "closeness" to green areas and their generous plot sizing, the planning community increasingly recognizes that urban sprawl causes predominantly negative ecological, aesthetic and economic impacts (Schwick, Jaeger, Bertiller, & Kienast, 2012). For example, sprawl disrupts ecosystems, endangers native fauna and flora, permanently modifies the scenic beauty of traditional landscapes and increases infrastructure costs for mobility and energy provision. It represents a worldwide challenge for sustainable development, since land and soils are scarce resources and are subject to increasing competition (Jaeger & Schwick, 2014). In particular, urban sprawl reduces the amount of fertile arable soils and pasturelands available for meeting the increasing demand for food production, and limits the land area suitable for producing renewable energies (Haber, 2007; Jaeger, et al., 2010).

In developed countries, urban sprawl results in part from the emergence of new lifestyles characterized by higher demands in terms of living space, green surroundings and mobility (Jaeger, et al., 2010). However, many scholars consider sprawl to be reinforced by market failures, as well as by inappropriate planning policies and economic incentives, which cause inefficiencies in urban development and prevent fully internalizing the costs of sprawl (Levine, 2005; Nechyba & Walsh, 2004; Pflieger & Ecoffey, 2011; Talen, 2013).

For instance, Levine (2005) studied the impact of spatial planning on urban sprawl in the US and highlighted that many municipalities explicitly favour low urban densities in their land use regulations, thereby encouraging urban sprawl. In a Swiss case study, Pflieger and Ecoffey (2011) showed that urban sprawl causes increased costs for the provision of water services, but that these costs are not always borne by the consumers who induce them by living in low-density neighbourhoods.

In light of these conclusions and of the many negative repercussions of urban sprawl, it is crucial to better understand the planning and economic drivers of sprawl, and to develop tools to identify and mitigate uncontrolled urban growth. These needs are a major reason why the Swiss Government initiated a CHF 13 million national research programme on the topic of "soil as a resource". The presented PhD was part of one research project titled, “Controlling urban sprawl to limit soil consumption (SPROIL)”. SPROIL aimed at: (1) assessing whether current spatial planning policies and plans have the potential to effectively limit urban sprawl; (2) identifying the economic drivers of urban sprawl and deriving new financial incentives to curb it; (3) developing fact-driven predictive tools to identify fertile soils particularly at risk of getting built over. The present PhD thesis addresses the first of these three aspects and specifically evaluates the spatial planning plans and policies that have been applied by Swiss municipalities to manage urban growth in recent decades. The two other aspects of the SPROIL project were addressed by two other research teams (see Weilenmann, Seidl, & Schulz, 2017 for selected results).

1.2. Specific context: local spatial planning policies and plans in Switzerland

Spatial planning aims to coordinate land-use related activities and steer spatial development in the long run (Lendi & Elsasser, 1991). Planning policies and plans are therefore key instruments for achieving compact urban forms and limiting urban sprawl (Kawakami, Shen, Pai, Gao, & Zhang, 2013). In Switzerland, a wide range of policies and plans have been developed at different institutional levels to this purpose since federal, cantonal and local governments are jointly responsible for spatial planning (Newman & Thornley, 1996). However, the present thesis focuses on municipal policies and plans, because in practice, municipal authorities are in charge of implementing concrete planning measures at the local level (Muggli, 2014).

Since 1980, all Swiss municipalities are required by federal law to develop a land use plan (*Nutzungsplan/plan d’affectation*) that is binding on landowners (Gilgen, 2012). Besides, a large number of municipalities have adopted additional growth-management policies (i.e., planning policies aimed at steering urban development towards compact urban forms) such as spatial planning guidelines, masterplans or measures against land hoarding (Kaiser, Rudolf, Berli, Hersperger, Kienast & Schulz, 2016).

However, most of these policies have been applied inadequately or too cautiously to effectively curb urban sprawl (Schwick, et al., 2012). For example, Gennaio and colleagues (Gennaio, Hersperger, & Bürgi, 2009) conducted a study in four municipalities situated near Zurich (Agglo Obersee) and concluded that land use plans were not successful at controlling all aspects of urban sprawl. While they were effective at limiting urban development to building zones and at promoting increased building density in built areas, they were unable to affect low-density development outside of building zones.

Another case study focused on the development of five municipalities in the Limmat Valley and came to similar conclusions, emphasizing that the building zones designated in land use plans were often too large to clearly restrict urban sprawl (Hersperger & Bürgi, 2010). More recently, Viallon (2016) assessed in Oberaargau the application of further growth-management policies that aim at redistributing the added and reduced value created through planning measures (e.g., an increase in the real estate value of a land plot through its designation as building zone) in order to encourage rational land use (Viallon & Nahrath, 2016). His analysis revealed that existing redistributive instruments were only marginally used and were sometimes even applied to circumvent legal restrictions on the extension of building zones.

These case studies provide valuable insights about the effect of local policies and plans on urban growth, but their results can rarely be generalized due to the Swiss federalist structure and the resulting political heterogeneity. In addition, even though several publications have sought to identify and describe suitable policies for limiting urban sprawl at the municipal level (e.g., Haag, 2006; Stauffiger, 2006; Institut für Wirtschaftsstudien Basel, 2016), none of them have explored the prevalence of these policies countrywide. As a result, systematic data on how municipalities try to steer their urban development is lacking in Switzerland, while knowledge about the quality of plans and policies is extremely limited.

This doctoral thesis focuses on planning evaluation and explicitly addresses these research gaps by means of a Swiss-wide survey of local growth-management policies, and by in-depth analyses of local plans (*Richtpläne/plans directeurs*) in roughly 40 municipalities. Complementary to this, interviews with cantonal planning officers and questionnaires addressed to local planning officials were employed to better understand why some municipalities are more likely to adopt growth-management policies and are more successful in their implementation.

1.3. Scope of the thesis and research questions

The knowledge gaps highlighted in the previous paragraph are addressed via three main research questions. Prior to detailing them, the present section first positions the doctoral thesis in the general context of planning evaluation and clarifies the research boundaries.

According to Alexander (2011, p. 32), planning evaluation involves “the evaluation of planning systems and/or their institutions, which must address the relevant aspects of their performance and evaluate their identified outputs and impacts to determine to what degree this planning has been a success or a failure”. A complete evaluation of local spatial planning in the context of urban growth would imply assessing a large number of drivers, actors, processes and outputs (Fig. 1.1).

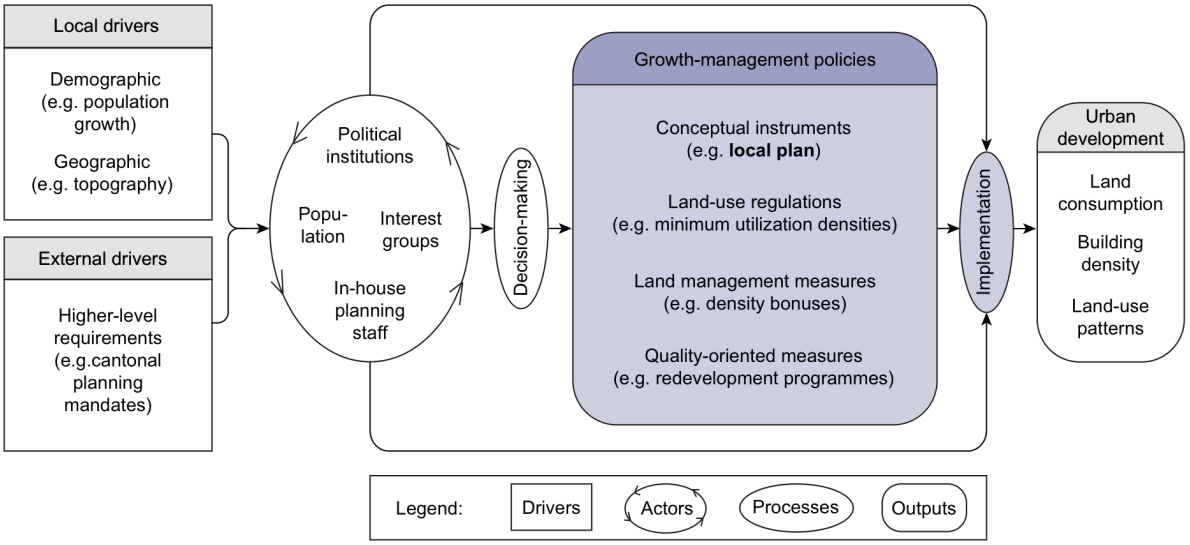

Figure 1.1. Schematic representatation of the drivers, actors, processes and outputs of the local planning process in the context of urban growth management (author's own elaboration). The aspects specifically addressed in this PhD thesis are represented by a violet background color.

First, it would require analysing the local and/or external drivers that trigger the depletion of open land caused by urban growth and that prompt local communities to engage in growth management. Local drivers may be, for example, demographic, geographic or socio-economic. Municipalities experiencing a strong population growth or that are geographically constrained tend to have less land amenable for development, which may encourage them to adopt growth-management policies in order to preserve their open landscape (Lubell, Feiock, & Ramirez De La Cruz, 2009; Saiz, 2010). Alternatively, external drivers such as cantonal planning mandates may oblige municipalities to better manage their urban development (Gilgen, 2012).

While local and external drivers are important for initiating policy discussion, the adoption of policies remains essentially political and is influenced by several local actors (Hersperger, Franscini, & Kübler, 2014) that should also be included in the analysis of local planning. In particular, different interest groups compete for open land and attempt to influence the local planning process in order to maximize their own interests (Lubell, et al., 2009; Ramírez De La Cruz, 2009). For example, environmental protection associations may support the adoption of growth-management policies in order to protect landscapes and ecosystems from urban growth, while private land developers may strongly oppose such measures, which restrict their long-term benefits. In addition, the outcome of the decision-making process also depends on local political institutions such as municipal authorities (e.g. Feiock, Tavares, & Lubell, 2008; Ramírez De La Cruz, 2009), as well as on local planning capacity and in-house planning staff (Göçmen & LaGro Jr, 2015; Hawkins, 2014).

Furthermore, planning evaluation implies assessing adopted growth-management policies (which may vary from conceptual instruments to quality-oriented measures; see Chapter 3 for more details), investigating how local actors influence their implementation and whether policies are successful at influencing urban development.

For example, policies may reduce land consumption, increase building density or affect the distribution of land use patterns (e.g. Gennaio, et al., 2009; Hersperger & Bürgi, 2010; Siedentop, Fina, & Krehl, 2016).

The evaluation of all drivers, actors, processes and outputs of local planning as presented in Fig. 1 would have been outside the scope of the present doctoral dissertation. Hence, this PhD thesis focuses specifically on (1) the evaluation of growth-management policies and plans, and (2) their implementation (displayed by a violet background colour on Fig. 1). Other specific elements of the planning process (i.e., the impact of cantonal planning mandates, planning capacity and population size) are accounted for in the analyses, but are not the primary subjects of this study.

The PhD is subdivided into two larger topics and three main research questions, each subdivided into detailed sub-questions labelled with letters.

Topic 1: Analysis of growth-management policies (in a sample of 630 Swiss municipalities):

1. Which growth-management policies do Swiss municipalities use to manage urban growth and to steer their urban development towards compact urban forms?

    A. What is the prevalence of growth-management policies in a large sample of small to large municipalities?

    B. How has the introduction of growth-management policies evolved over the past decades?

    C. What is the link between growth-management policies, population size (i.e., number of inhabitants) and planning capacity?

Topic 2: In-depth analysis of local plans (in a sub-sample of circa 40 Swiss municipalities):

2. What is the influence of cantonal planning mandates on the quality and implementation of local plans (*Richtpläne*) in the context of sustainable spatial development?

    A. Why do some cantons mandate local plans while others rely on voluntary planning and only enable them? How do cantonal planning officials assess the benefits and drawbacks of such planning mandates?

    B. How do cantonal planning mandates influence the policy focus and the formal quality of local plans? How do they influence the implementation of their policies?

3. How can the quality of local plans be assessed within the framework of plan evaluation and how does plan quality influence plan implementation?

    A. What is the quality of local plans?

    B. Are plans' policies implemented and do local planning officers consider their plans as being useful for steering spatial development in daily practice?

    C. Does the quality of local plans influence their implementation?

1.4. Overview of the thesis

This PhD thesis consists of six chapters and two appendices. The three main chapters (Chapters 3, 4 and 5) address each of the main research questions and consist of scientific publications submitted to international peer-reviewed journals. The first paper (Chapter 3) was submitted to the *Journal of Environmental Planning and Management* in October 2016 and is currently in revision (minor revisions received in December 2016). The second paper (Chapter 4) was submitted to *European Planning Studies* in December 2016, while the third paper (Chapter 5) was submitted to *Environment and Planning B: Urban Analytics and City Science* (formerly *Environment and Planning B: Planning and Design*) in January 2016. Appendix A entails a paper about selected growth-management policies written in French and published within the Forum für Wissen 2015 *Von der Siedlungsentwicklung zur Landschaftsgestaltung*, which took place in December 2015 at the Swiss Federal Research Institute WSL. Finally, Appendix B includes the cover page of a report written in the context of the SPROIL project in collaboration with the research project, "Determinants of Local Growth Management Regulations and Its Relation to Urban Sprawl. A Spatial Econometric Analysis at the Municipal Level" conducted by Jan Berli and Tobias Schulz.

In detail, the chapters of this thesis are organized as follows:

Chapter 2: Provides an overview of *current knowledge* regarding key aspects of this dissertation, including the definition of urban growth and urban sprawl, the impact of urban growth on different types of municipalities, the different means for managing urban growth, a description of spatial planning in Switzerland, and an introduction to planning evaluation.

Chapter 3: Includes the paper titled, "Planning for compact urban forms: Local growth-management approaches and their evolution over time" and answers research question 1. This chapter introduces the concept of "compact urban forms", details how growth-management policies were categorized in the context of the study and describes the Swiss-wide survey conducted to assess the prevalence of growth-management policies. Based on a representative sample of 630 municipalities, it provides detailed and large-scale data about how the use of growth-management policies has evolved in Swiss municipalities since the 1970s.

Chapter 4: Comprises the paper titled, "Impact of planning mandates on local plans: A multi-method assessment" and addressed the second main research question. This article focuses specifically on local plans that aim to coordinate long-term local spatial development and that are mandated by a selection of cantonal governments. In this study, a multi-method approach consisting of interviews, in-depth content analyses of 32 plans and questionnaires was used to assess whether cantonal planning mandates are efficient at increasing policy focus, formal quality and the implementation of local plans in the context of sustainable spatial development. In addition, the study explores the reasons that prompt cantonal governments to mandate local plans.

Chapter 5: Includes the paper "Evaluating quality and implementation of local plans: An integrated approach", which answers the third main research question. This chapter focuses on local plans but does not refer to the management of urban growth in particular. Instead, it considers the issue of plan evaluation and is more conceptual than the two previous papers (Chapters 3 & 4). In particular, this article critically reviews the traditional approaches for assessing plan quality and implementation, and discusses why these approaches are less appropriate for assessing local plans. In order to contribute to recent debates on planning evaluation, this chapter proposes a novel framework for assessing the quality of local plans, as well as an integrated approach for linking plan quality to plan implementation. The framework and the integrated approach are tested with a set of 37 local plans and their potential usefulness for planning practitioners is discussed in the context of local planning.

Chapter 6: Presents a synthesis of the thesis' main findings, discusses methodological and conceptual limitations, and concludes with an outlook on future research needs and implications for planning practice.

Appendix A: Entails the article "Développer l'urbanisation vers l'intérieur: Tour d'horizon des instruments communaux et de leur utilisation", which describes in detail the use of four growth-management policies in Swiss municipalities (i.e., local plans, minimum utilization densities, public acquisition of land, programmes for the redevelopment of existing urban areas).

Appendix B: Provides the cover page of the WSL report "Raumplanung in den Schweizer Gemeinden: Ergebnisse einer Umfrage". This document presents the detailed results of the Swiss-wide survey conducted in the context of the present PhD thesis and the associated project, "Determinants of Local Growth Management Regulations and Its Relation to Urban Sprawl. A Spatial Econometric Analysis at the Municipal Level".

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CHAPTER 2: STATE OF THE ART

2.1. Urban growth and urban sprawl

2.1.1. Definition and distinction between urban growth and urban sprawl

The terms *urban growth* and *urban sprawl* are often used as synonyms, although they have different meanings and implications. According to Bhatta (2010, p. 10), urban growth "is a sum of increase in developed land" and results from the conversion of land cover such as forest, grassland, or cropland to built-up areas. Urban sprawl is a specific form of urban growth, which typically has negative connotations. In an effort to quantify, describe and map urban growth, Wilson, Hurd, Civco, Prisloe and Arnold (2003) distinguished three main types of urban growth : *infill*, *expansion* and *outlying* growth, with *outlying growth* further separated into *linear branch*, *clustered branch* and *isolated* growth (Fig. 2.1.).

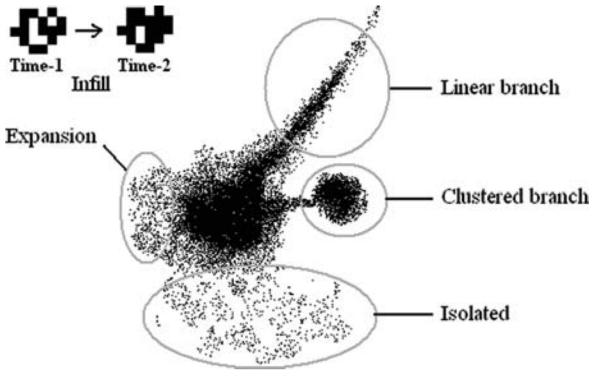

Figure 2.1. Schematic representation of the different formsof urban growth, according to a representation from Bhatta (2010, p. 11).

According to Wilson and colleagues (2003), these different forms of urban growth can be described as follows :

Infill: The conversion of an undeveloped parcel of land into a built-up area within an existing urban area. This kind of urban growth usually occurs where public facilities such as roads, sewers and water are already present. Infill development has been defined by Aly and Attwa (2013) as the encouragement to develop vacant, abandoned or underutilized land in already built-up areas, in order to reduce the conversion of open land beyond the borders of an existing urban area.

Expansion: Conversion of undeveloped parcels of land into built-up areas at the fringe of existing urban areas, which represents an expansion of the existing urban patches.

Outlying : Change from undeveloped to developed land occurring beyond the borders of existing urban areas. If this form of urban growth is dominated by the construction of new buildings surrounded by little developed land, it is defined by Wilson et al. (2003) as *isolated*.

> However, if the new buildings are connected to each other and form a new linear development, urban growth is said to form *linear branches*. Finally, *clustered branches* are a form of urban growth that can be neither classified as linear nor isolated, but formed of clusters or groups.

In their approach, Wilson and his team (2003) explicitly refrained from determining which patterns of urban growth should be classified as urban sprawl. Instead they argued that each individual should decide for themselves what they consider as urban sprawl, independent of the amount of open land converted into built-up areas. In fact not all forms of urban growth can be considered urban sprawl; and what is viewed as urban sprawl by one person might not be considered urban sprawl by another (Roca, Burns, & Carreras, 2004). Infill development, for example, is often seen as a sustainable form of urban growth and is generally considered as a remedy against urban sprawl (Bhatta, 2010). Thus, sprawl cannot be quantified solely according to the amount of open land converted into built-up areas.

The lack of a clear definition relating to the concept of "urban sprawl" limits the interpretation and comparison of results among the multiple studies assessing urban and land-use transformations in different regions of the world (Jaeger, Bertiller, Schwick, & Kienast, 2010). Based on a broad review of the many definitions attributed to the term "urban sprawl" in the international literature, Jaeger and colleagues (2010) concluded that the prevailing confusion mainly arises because most studies use the term "urban sprawl" ambiguously to (1) describe different kinds of urban development patterns, and (2) characterize their causes and consequences. To solve this issue Jaeger and Schwick proposed a new definition, which clarifies the terminology and clearly distinguishes the spatial phenomenon of urban sprawl from its causes and consequences (2014, pp. 295-296):

> Urban sprawl is a phenomenon that can be visually perceived in the landscape. A landscape suffers from urban sprawl if it is permeated by urban development or solitary buildings and when land uptake per inhabitant or job is high. The more area built over and the more dispersed the build-up area, and the higher the land uptake per inhabitant or job (lower utilization intensity in the built-up area), the higher the degree of urban sprawl.

According to this definition, the degree of urban sprawl depends on three main parameters: (1) the amount of built-up area, (2) the dispersion of the built-up area in the open landscape, and (3) the land uptake per person or job. This definition was tested widely in Europe and North America and has two main advantages that are of primary interest in the context of the presented study. First, it allows distinction between urban sprawl and other forms of urban growth which— under current planning norms—have positive repercussions, e.g. infill development. The latter is not considered as urban sprawl, since urban densification increases the number of people living and working in a given urban area, thereby decreasing mean land uptake per person and job. Second, this definition leaves room to define what is considered as an "urban area" (Jaeger, et al., 2010). In this PhD dissertation, the concept of "urban area" refers to any built-up area—ranging from large areas with urban character such as cities; to villages, hamlets and single isolated buildings in the open landscape—because the management of urban growth is an issue present across various spatial scales (see section 2.1.4. for a detailed discussion of this topic).

2.1.2. Causes of urban growth and urban sprawl

The causes of urban sprawl have been explored and debated for over 20 years. Overall in developed countries urban sprawl is considered a result of population growth (Bhatta, 2010), from the decay of central cities and the rise of mobility that followed the end of the Second World War, and from more recent socio-economic changes, which have encouraged the emergence of a new lifestyle calling for more private mobility and space (Schwick, Jaeger, Bertiller, & Kienast, 2012). In addition, scholars acknowledge that sprawl is accelerated by market and policy failures. In fact, market forces often do not account for the positive externalities of open space, landscape amenities and their associated ecosystem services. In addition, the economic market fails to account for the increased infrastructure costs induced by uncontrolled urban growth, and for the social costs of commuting, such as pollution and congestion (Brueckner, 2000). Finally, some authors have also suggested that urban sprawl might be reinforced by the legal structure and the division of political authority resulting from institutional complexity (Buzbee, 1999; Hirt, 2014; Muggli, 2014).

The first studies assessing the drivers of urban sprawl focused mainly on the USA, and based their explanation on the monocentric city model of Muth (Muth, 1969, as cited in Weilenmann, Seidl, & Schulz, 2017) and Mills (Mills, 1972, as cited in Weilenmann, et al., 2017), a standard model used to explain spatial structure in urban economics. According to this model, there is high competition for access to cities' central business districts, inducing an increase in land prices and development densities towards city centres (Paulsen, 2013). In contrast, land prices tend to decline with distance to the centres, lowering the incentive to use land rationally and inducing a decrease of building density. In line with this simplified model, urban growth mainly results from population growth, rising income and falling communication costs (Brueckner, 2000). Population growth in urban areas is the result of the natural increase in population, and of the migration into urban or peri-urban areas (Bhatta, 2010). In cities and their surroundings, inhabitants benefit from increased mobility, more job opportunities and entertainment possibilities, and can often find better basic and specialised services such as health care facilities. Rising personal income has allowed households to own a car and invest money in single-family houses "outside cities in the green", which consume a large amount of open space. In addition, the construction of highways has increased the accessibility of suburban locations, thereby causing the extension of city core areas into the surrounding open landscape (Ewing, 2008). In parallel, the decentralization of the population has led to the decentralization of other activities, such as industrial districts and service areas. The monocentric city model performs well at explaining the historical causes of urban growth. For example, Weilenman and colleagues (2017) recently confirmed that accessibility and income plays a key role in explaining the evolution of urban growth patterns in Switzerland.

However, scholars increasingly recognise that urban sprawl is caused by many more factors than just population growth, transportation costs, income and land prices. In fact, local inhabitants also choose residential locations situated far away from city centres to avoid the perceived disadvantages of central urban locations, such as noise, pollution and tax burdens (Nechyba & Walsh, 2004). For example, many urban residents move to suburban areas because they believe that green and quiet surroundings offer a higher quality of life than dense urban cores (Bhatta, 2010). In Switzerland this inclination has been confirmed in a study that assessed the residential preferences of the population by means of a survey (Tobias et al., 2016). In the questionnaire

respondents clearly indicated that they prefer living environments which resembled “villages” or “small cities”, and that they favour green neighbourhoods including forest patches, water bodies and open land.

The market failures that reinforce the above-mentioned socio-economic and cultural drivers of urban sprawl mainly consist of subsidies (e.g. in the sectors of transport and infrastructure provision, and in the land and housing market), which indirectly support high land consumption and prevent the internalisation of the costs of land development (Ewing, 2008). For example in the context of transportation infrastructures, costs are largely borne by the public sector. Therefore, “the result (of these subsidies) is the over-provision of transportation infrastructure relative to what it would be if user fees existed to capture more or all of the direct costs—not to mention externalities—of transportation infrastructure use. […]. Sprawl and discontiguous urban growth are logical outcomes.” (Hanson, 1992, p. 62). Moreover, car owners do not bear the entire costs engendered by the negative impacts of private traffic, such as noise and pollution. As a consequence, commuting costs do not substantially reduce the attractiveness of suburban locations.

In many countries including the USA (Ewing, 2008), Germany (Nuissl & Rink, 2005) and Switzerland (Estermann, 2016; Seidl, 2015), the fiscal regime also contributes to favouring dispersed urban settlements. In fact, house ownership is subsidized indirectly via tax reliefs on investments made in private properties. This phenomenon, coupled with reduced land prices in suburban regions, encourages the low-density development of suburban and traditionally rural areas.

Scattered urban development may also be encouraged by inefficient or poorly designed spatial planning policies. Talen (2013) and Hirt (2014), for instance, reported that conventional zoning may contribute to sprawl because it has detrimental impacts on urban patterns at local scale. In particular, traditional building codes tend to favour single-use subdivisions characterized by large residential neighbourhoods where commercial and mixed-use buildings are not allowed. Such regulations create significant barriers to the emergence of compact urban forms essential to limit urban sprawl.

Compact urban development is often additionally impeded by institutional fragmentation (Estermann, 2016). In Switzerland as in the US and in many other countries with federal government, most land-use decisions are taken by local governments, and competition with neighbouring municipalities has a strong influence on their policy decisions. In fact, municipalities commonly depend on local taxes and seek to attract new investors and inhabitants in order to increase their income (Nuissl & Couch, 2007). As a result they are often reluctant to adopt strong policies against uncontrolled urban growth, or they even actively promote low-density development. This phenomenon prevails in small municipalities that are more vulnerable to the influence of powerful local investors and landowners (Siedentop & Fina, 2012). A case study conducted in the context of the present PhD dissertation by Thaler (2014) documented this trend in three municipalities situated, along a central to peripheral gradient, in the Zurich metropolitan area. Expert interviews and archive documents revealed that since the 1950s urban development in the three municipalities had mostly been driven by local influential individuals who were important land investors and developers, and had very good connections to local authorities and landowners. This situation led to large-scale development in the three villages and to the appearance of typical sprawl-related urban patterns.

The influence of institutional fragmentation and local autonomy on spatial planning is a widely discussed topic in Switzerland and has been further studied by Muggli (2014). Cantons and municipalities have repeatedly been blamed for leniently implementing the Federal Law on Spatial Planning, and for thereby failing to limit land consumption. In his study, Muggli assessed the extent to which federalism and direct democracy have an impact on urban sprawl. He noticed that current municipal and cantonal borders rarely correspond with today's planning issues. Additionally he acknowledged that small municipalities are often overwhelmed by the complexity of spatial-planning tasks, and that direct democracy might sometimes allow powerful interest groups to influence local urban development substantially. However, he concluded that neither federalism nor direct democracy can be held responsible for increased urban sprawl, because both processes can contribute to consensus building and leave room for innovation, two key conditions for sustainable urban development. Muggli insisted on the need to increase planning capacity and know-how in small municipalities, and suggested municipal mergers and regional coordination (e.g. *Agglomerationsprogramme*) to this purpose.

2.1.3. Negative impacts of urban growth and urban sprawl

The negative repercussions of urban sprawl are manifold, and can broadly be classified into three categories: environmental, economic, and social impacts (EEA & FOEN, 2016; Jaeger et al., 2015). A recent report from the European Environment Agency and the Swiss Federal Office for the Environment provides a comprehensive overview of these impacts (EEA & FOEN, 2016). It identifies 42 different environmental effects, divided into nine main themes (e.g. land cover, geomorphology, local climate, energy and climate change, air pollution, noise and light, water, flora and fauna, landscape scenery and land use), twelve economic impacts, and eight impacts linked to social issues and quality of life. A complete review of these different impacts would be beyond the scope of the present dissertation. Instead, some important impacts identified by the EEA and the FOEN (2016) are briefly illustrated in the following paragraphs.

Regarding environmental impacts, urban sprawl has been blamed for e.g. increasing air and water pollution and decreasing species richness. In a study conducted in Michigan, USA, Tu and colleages (2007) noticed that urbanized watersheds entailed high concentrations of water pollutants, and that the increase of pollutants' concentration over time was stronger in suburban and rural areas affected by urban sprawl than in central cities. In Switzerland, urban sprawl was found to have strong repercussions on the distribution of vascular plants and birds (Concepción et al., 2016). In fact, scattered urban patterns foster the proliferation of non-native and ruderal plants, and favour common, generalist bird species at the expense of specialist birds such as ground-nesting species, which are less likely to nest in buildings and other man-made substrates.

In the category of economic impacts urban sprawl is, for example, recognized to increase infrastructure and maintenance costs. Pflieger and colleagues (2011) demonstrated that the annual costs of water provision per capita in the agglomeration of Lausanne, Switzerland, vary from €118 to €169 per inhabitant in densely populated urban areas, to a range of €408 to €420 in less dense areas. These differences mainly result from economies of scale related to maintenance costs. In addition, urban sprawl leads to the loss of fertile and productive soils, which are vital for food production (Haber, 2007). This process reduces self-sufficiency and thereby increases dependence on imported food products and increases the costs of food supply.

Finally, urban sprawl may also increase inequalities and affect social cohesion. In some urban areas scattered urban development coupled with good transportation infrastructures encourages better-off inhabitants to settle in suburban locations in order to benefit from green surroundings and avoid noise and pollution. As a consequence, marginalized communities with fewer resources tend to be left behind and become concentrated in city centres, creating patterns of residential segregation (Cassiers & Kesteloot, 2012). Urban sprawl may additionally have negative impacts on the populations living in suburban locations. For example, Frumkin (2002) suggested that long automobile commuting trips, which are favoured by sprawled urban patterns, are a source of stress and increased health issues such as back pain and cardiovascular diseases.

2.1.4. Scaling issues of urban sprawl

A large number of international studies have assessed urban sprawl at the scale of metropolitan areas, without considering the impact of this phenomenon beyond these agglomerations. For example, Hamidi and Ewing (2014) examined urban sprawl in the 162 largest urbanized areas in the United States, whereas Nazarnia and colleagues (2016) compared the extension of sprawl in Montreal, Quebec city and Zürich.

Recent analyses have however revealed that urban sprawl might also affect large territories not commonly considered as urban areas. European-wide studies have suggested that while urban sprawl is mainly concentrated around main city centres, and along large transportation corridors and coastlines (Hennig et al., 2015), its patterns may vary according to the organization of national urban systems (Siedentop & Fina, 2012). Siedentop and Fina (2012) observed that urban growth mainly occurred in clusters in countries that are demographically and economically dominated by their capital area or a few large cities, such as Austria, Ireland, Latvia or the United Kingdom. In contrast, they noticed that "countries with a rather polycentric urban system such as Denmark, Germany, Italy, and the Netherlands experience a more evenly distributed pattern of urban expansion" (Siedentop & Fina, 2012, p. 2780).

A study by Jaeger and Schwick (2014) showed that the Swiss polycentric urban system, characterized by a large number of interconnected mid-sized cities, has also led to dispersed patterns of urban development, and that urban sprawl increased by 155% in Switzerland between 1935 and 2002. Although this increase was strongest in suburban areas surrounding large and medium-sized cities, it also affected traditionally rural or agricultural municipalities, but to a lesser extent. In an article about the institutional causes of urban sprawl in Switzerland, Mann (2009) referred to the extension of building activities in rural landscapes as "rural sprawl".

The new areas resulting from scattered urban development—often described as sub- or peri-urban areas, urban fringes or in-between territories— have distinct specificities, which have to be taken into account in policy making (Hersperger, Langhamer, & Dalang, 2012; Wandl, Nadin, Zonneveld, & Rooij, 2014). The fact that these regions are neither distinctly urban nor rural, but rather something "in-between", implies that their needs cannot be addressed with policies specifically developed towards managing urban growth in "urban" areas. Many municipalities that are nowadays strongly affected by urban sprawl are situated in traditionally rural regions, and have too few inhabitants and financial resources to possess strong municipal administration with in-house planning staff able to take firm actions against urban sprawl. To further explore this topic, Mann

(Mann, 2009) interviewed local representatives of municipalities situated in sprawl-prone areas and observed that none of them were aware of the need to preserve open space. He therefore suggested that incentives and planning measures developed to steer the process of spatial development towards less land consumption should be better directed towards local administrations. In fact, it is crucial to understand the challenges faced by municipalities situated at the interface between rural and urban areas in order to motivate their authorities to restrict urban sprawl.

2.2. Means to limit urban growth and urban sprawl

To limit urban sprawl, public policies aim to concentrate settlement areas and steer urban growth towards compact urban forms characterized by clear boundaries, high population and building densities, and mixed land-uses (Burton, Jenks, & Williams, 2003; Ye, Mandpe, & Meyer, 2005). In this context, special attention is being paid to the integrated planning of transport and settlement development (EEA & FOEN, 2016), since accessibility has been identified as a major driver of urban sprawl (Weilenmann, et al., 2017). When referring to the typology developed by Wilson and colleagues to characterize urban growth (Wilson, et al., 2003, see section 2.1.1. of this thesis), compact urban development corresponds to infill development as well as to the compact and spatially limited expansions of existing urban areas.

According to Alexander and Tomalty (2002), the advantages of compact urban forms include: (1) more efficient land-use in existing urban areas and less development pressure on surrounding open landscapes, (2) reduced car use and commuting distances, (3) more mixed land uses, leading to an increase in quality of life (4) reduced consumption of water and energy due to high building densities and a small share of single-family homes, (5) greater efficiencies in the provision and use of infrastructural systems, (6) improved quality of life for a wide variety of people—including seniors, children and handicapped people—by providing services and amenities closer to residential areas, and (7) improved variety of housing types adapted to people in various life stages (e.g., divorced singles, single parents, elderly people and students).

A wide range of growth-management policies have been developed to steer urban development towards compact urban forms, these policies can be divided into three broad categories: ‘regulations’, ‘economic interventions’, and ‘institutional changes, management and advocacy’ (Nuissl & Couch, 2007). Comprehensive overviews of these policies can be found in Pendall, Puentes, and Martin (2006), Nuissl and Couch (2007), EEA and FOEN (2016), and Institut für Wirtschaftsstudium Basel (2016).

The first paper of the present thesis (Chapter 3) is specifically dedicated to growth-management policies that are commonly applied at local scale, whereas a selection of policies applied at local through to national institutional levels is presented in Table 2.1.

Spatial planning is the main policy field in which regulations aimed at managing urban growth can be found (Nuissl & Couch, 2007). Planning policies such as density controls or urban growth boundaries (Table 2.1.) intend to steer the quality, timing and location of urban development, and are usually enforced in legally binding spatial plans which can be found at different levels of governance. In most countries municipalities have to

develop a land use plan covering their entire territory. In many federal states including Germany and Switzerland, these local land use plans are framed by coarser plans prepared by medium tiers of administration, such as *Länder* in Germany and *cantons* in Switzerland. The specificities of spatial planning in Switzerland are further detailed in section 2.3.1.

Economic interventions aim to "influence the behaviour of those actors who potentially bring about urban sprawl in such a way that 'sprawling' behaviour becomes less tempting to them" (Nuissl & Couch, 2007, p. 228). To this purpose economic interventions may use financial incentives (e.g., subsidies towards urban regeneration, see Table 2.1.) or disincentives (e.g., tax on added land value) in order to make positive behaviours more profitable and negative behaviours more costly. In addition, economic interventions intend to correct incentives that lead to market distortions (e.g., the abolishment of tax deductions for commuting between homes and workplaces) and to internalize the negative externalities of urban sprawl (e.g., congestion tax) (Seidl, 2015).

Finally, policies of institutional change, management and advocacy are persuasive rather than restrictive, and are based on the idea of commitment to a common goal (Nuissl & Couch, 2007). For example, they may provide information to those actors whose decisions determine urban development, such as elected officials or the general public, in order to encourage behaviours that lead to less land consumption (e.g. campaigns against urban sprawl and for lifestyle changes, see Table 2.1.).

Table 2.1. Growth-management policies : selected examples.

Measure	Intended impact on urban sprawl	Source or example
Regulations		
Density controls	Increase the density of built-up areas	Nuissl & Couch, 2007
Clear separation of building zones and non-building zones (e.g. green belt, urban growth boundaries)	Restrict urban development and set clear limitations for urban areas	EEA & FOEN, 2016; Siedentop et al., 2016; Gennaio et al., 2009
Setting targets, limits and benchmarks for sprawl	Limit land uptake per capita	Schwick et al., in preparation
Economic intervention		
Subsidies towards urban regeneration	Strengthen the attractiveness of inner urban cores to encourage inhabitants to settle in city centres rather than in low-density suburban areas	Nuissl & Couch, 2007
Charges for the use of roads or congestion taxes	Discourage the use of cars and make car users aware of the true socio-environmental costs of motorised traffic	EEA & FOEN, 2016
Abolishment of tax deductions for commuting between homes and workplaces	Make commuters aware of the true socio-environmental costs of commuting	EEA & FOEN, 2016
Reduction or adaptation of tax reliefs on investments made in home ownership	Reduce the incentive to build single-family houses in order to favour economical use of land	Seidl, 2015
Transferable Development Rights	Concentrate urban development in areas that are already widely urbanized and accessible (e.g., urban municipalities) and restrict land consumption in vulnerable or less accessible areas (e.g., rural municipalities) by setting a cap for new building zones, assigning development rights and creating a market for the trading of these development rights	Menghini, 2013
Introduction of redistributive land policy instruments (e.g., “tax on added land value”)	Compensate for the increase in property values resulting from planning, development or infrastructure activities	EEA & FOEN, 2016; Viallon, 2016
Institutional change, management and advocacy		
Introduction of regional planning agencies adapted to present functional areas (e.g., “Agglomerationsprogramme” in Switzerland)	Apply a strategic vision over functional areas and control the competing development demands of local authorities	Muggli, 2014; Nuissl & Couch, 2007
Municipal mergers	Create larger municipalities, thereby encouraging economies of scale, specialisation in local governments, and increased planning performance (e.g., an increase in planning capacity through the recruitment of in-house planning staff)	Muggli, 2014
Campaigns against urban sprawl and for lifestyle changes	Increase the awareness of the general public and local administrations with regard to the negative impacts of sprawl and the long-term benefits of lifestyle changes towards a more sustainable way of living	Nuissl & Couch, 2007; EEA & FOEN, 2016

2.3. Spatial planning in Switzerland

2.3.1. Organization and specificities

The organization of the Swiss spatial planning system is shaped by the country's federalist structure, with its important division of power between the federal state, the 26 cantons and the 2495 municipalities (Mueller & Hersperger, 2015). In their typology of planning systems Newman and Thornley (1996) classified Switzerland within the German family, since the federal, cantonal and municipal institutional levels are jointly responsible for spatial planning, but have distinct areas of responsibilities. At federal level, the government enforces the Federal Law on Spatial Planning and coordinates cantonal planning activities (VLP-ASPAN, 2012). The cantons are in charge of the implementation of spatial planning and enforce cantonal laws on spatial planning and regulations about the construction of buildings and roads (Gennaio, et al., 2009). They also develop cantonal comprehensive plans (*Richtpläne*) that specify the general organisation of land-use in the cantons, and the future direction of spatial development. These plans are binding for cantonal authorities and have to be approved by the Federal Council (VLP-ASPAN, 2012). Most of the cantons delegate the responsibility of specifying how land should be used in practice to the municipalities. For this purpose the municipalities develop land use plans (*Nutzungspläne*), which are binding for landowners and specify precisely how land can be used at the level of individual lots.

Municipalities therefore constitute the institutional level with the greatest decision-making power regarding the practical implementation of local planning (Hersperger, 2013; Mann, 2009; Rérat, Söderström, Piguet, & Besson, 2010). The responsibility for local planning in Switzerland is therefore split among the 2495 municipalities. Swiss municipalities are rather small by European standards, with an average population of 3'154 inhabitants, compared with an average of 40'303 in the Netherlands, 32'700 in Sweden, 7'362 in Italy, 7'089 in Germany, 3'582 in Austria and 1'753 in France (Eurostat, n.d.).

The basic instrument of municipal spatial planning is the land use plan and its associated building ordinance (*Baureglement*). Land use plans demarcate the boundaries between building and non-building zones, a key aspect of the Swiss planning system. The building zones are divided into different classes, depending on their targeted land use. The building ordinance specifies the conditions and restrictions that apply in each zone, and defines specific building regulations. In particular, they specify the allowed or required building densities. Land use plans and their corresponding building ordinance usually undergo a general revision every 10-15 years (Gennaio, et al., 2009). In addition to the land use plan, municipalities can develop other instruments such as special district plans (*Sondernutzungspläne*), local plans (*kommunale Richtpläne;* in English also known as a *municipal comprehensive plan*) and diverse planning strategies and concepts. Unlike land use plans, special district plans do not regulate the whole municipal territory but are restricted to a specific district (Gilgen, 2012), for which they provide more details. They may specify, complement or even replace some of the land use plan prescriptions (Gilgen, 2012, Hersperger & Cathomas, 2015). The local plan, which consists of a map and a written text, covers the whole municipal territory. It describes the municipal spatial development objectives and specifies how the municipality plans to attain and coordinate them. The local plan has a coarser resolution than the land use plan and is only binding for the municipal authorities. In Switzerland only the land use plan is

mandatory for all municipalities. It represents the minimal standard in terms of municipal spatial planning, but requirements regarding content may vary from one canton to another. Likewise, the obligation to develop other complementary planning documents such as municipal local plans depends on the cantonal affiliation.

The municipal authorities are key actors in spatial planning at a local scale (Hersperger, Franscini, & Kübler, 2014). They hold the legislative and executive power, and have to approve all decisions concerning spatial planning. In large municipalities, authorities can usually rely on in-house planning staff responsible for the management of the main planning tasks (Kaiser et al. 2016). Private planning consultants may however also play an important role (Kaiser et al. 2016). Large municipalities regularly call on their expertise in cases involving complex issues. A large proportion of small municipalities outsources the entire administrative management of their local planning to such consultants. In fact, small municipalities often have less planning capacity due to the lack of trained planners in their administration and to a high turnover among local authorities, both at the executive and legislative level.

Another special feature of local spatial planning in Switzerland is the high level of public participation due to the principle of direct democracy (Muggli, 2014). In many municipalities, any revision of the land use plan has to be approved by the population in a public vote (Hersperger, 2013). Specific stakeholder groups, such as local political parties or house-owner associations, may also play an important role in local planning. These policy actors "seek to actively influence the substance of policy decisions and thereby reorient policy objectives to better fit their own preferences" (Hersperger, et al., 2014, p. 1302). They may form coalitions to ensure their own interests are taken into account in policy processes.

2.3.2. Recent debates and current challenges

Switzerland benefits from a tradition of implementing policy with strong regulations on land development (Price et al., 2015). The Swiss Federal Law on Spatial Planning, which was introduced in 1980, already stipulated that land has to be used economically, and that settlements extensions should be limited (Loi fédérale sur l'aménagement du territoire, LAT, 1979). To this purpose, the Federal Law entails an article specifying that building zones should only be as large as required to accommodate expected population growth for a time period of 15 years (Hersperger, et al., 2014).

However, built-up areas and building zones have grown apace since the 1980s, and the Federal Law on Spatial Planning has failed to prevent their large-scale extension (Jaeger & Schwick, 2014). This evolution mainly took place because initially designated building zones were too large, owing to unrealistic population projections and to the will of many municipalities to encourage urban growth in order to attract new taxpayers (Hersperger, et al., 2014). According to Müller-Jentsch and Rühli (2010), these oversized building zones represent the main weakness in Swiss planning policy, along with strong property rights and the close proximity of municipal planning authorities to local landowners. As a result Swiss planning policy currently faces two related issues: (1) the reserve of undeveloped building zones (i.e., plots of land designated as building zones, but not yet developed) is too large, and (2) there is a severe imbalance in the supply and demand of undeveloped building zones between urban and rural areas (Menghini, 2013).

In urban areas building densities are already high and most undeveloped building zones are well connected to private and public transport systems, two key conditions for a compact urban development (ARE, 2012). However, the amount of undeveloped building zones is too low to meet the demand brought about by the expected population growth of the next decades. In contrast, areas situated far away from urban centres (i.e. mostly peri-urban, rural and tourism-oriented areas) have very large undeveloped building zones, and these are only marginally connected to public transport networks (ARE, 2012; Fahrländer Partner, 2008; Menghini, 2013). Consequently, the actual distribution of undeveloped building zones strongly impedes future compact urban development.

These conclusions, coupled with growing public concerns about the effects of urban sprawl—which people mostly perceive through the expansion of new built-up areas on the outskirts of existing settlements and the increase of buildings and infrastructures in the open landscape— led to intense political debates at the turn of the last decade (Hersperger, et al., 2014). A transfer of some responsibilities from the municipal level to cantonal or federal levels was suggested in order to strengthen spatial planning and better control the management of building zones (Hersperger, et al., 2014). In this context the Swiss population accepted an amendment of the Federal Constitution in 2012 to limit the proportion of second homes to 20% of the housing stock of any municipality (Grêt-Regamey, Altwegg, Sirén, van Strien, & Weibel, in press). The primary intent of this amendment was to limit the construction of second homes in touristic municipalities, and thereby avoid the loss of large unspoiled mountain areas to sprawl. In 2013 the Swiss population also accepted a revision of the Federal Spatial Planning Law with a clear majority of 63%. The revised text specifies in particular that: (1) added property values created through planning measures (e.g., the increase of the real estate value a plot experiences due to its assignment to a building zone) have to be levied through a tax amounting to at least 20% of the increase in property value, and (2) undeveloped building zones for which there is no predicted demand in the next 15 years have to be reclassified as non-building zones (Jaeger & Schwick, 2014).

This revision aims to reduce the size of undeveloped building zones, promoting compact urban development through infill redevelopment and densification, and encourage developers and authorities to use land more economically. However, the implementation of the Law on Spatial Planning, and especially these new amendments, faces several challenges. First, property rights are very strong in Switzerland, and any reduction of property value resulting from the rezoning of a building zone into a non-building zone must be compensated for (Article 5 of the Federal Law on Spatial Planning). This represents a major financial burden for most municipalities and severely impedes the effective reduction of undeveloped building zones (Menghini, 2013). Second, infill redevelopment and densification are complex processes that overwhelm the vast majority of small and medium-sized municipalities, which have limited financial capacity and cannot rely on trained in-house planning staff for their administration (VLP-ASPAN, 2015). In fact compact urban development implies finding innovative solutions to increase the density of existing built-up areas, for example through land readjustment. Such measures are more complicated to implement and may lead to more conflicts than the ancient practice consisting of simply designating new building zones at the fringes of settlement areas.

In order to better support municipalities in fulfilling their planning tasks and effectively steering their urban development towards compact urban forms, the Swiss Spatial Planning Association (VLP-ASPAN) offers different courses and counselling services for municipal authorities. In parallel, research teams are developing innovative decision support platforms and visualization tools that could help local authorities and stakeholders consider and explore trade-off decisions in spatial development (e.g., Drobnik, Huber, & Grêt-Regamey, 2016; Hayek, von Wirth, Neuenschwander, & Grêt-Regamey, 2016). Regarding the reduction of undeveloped building zones and their financing, several innovative planning instruments have been proposed and recently discussed (Institut für Wirtschaftsstudium Basel, 2016; Estermann, 2016). Among them transferable development rights (TDR) have gained attention in the last years. This instrument implies setting a cap for building zones and creating a market for the trading of development rights among property owners. According to Menghini (2013, p. 3), TDR is:

> "a market-based instrument, which allows transferring development rights. The results of such transfers may be seen as a form of rezoning. In a TDR market, land-owners in so-called 'sending areas' can sell their right to build on a parcel of land, to landowners in 'receiving areas'. This results in less land consumption in the former and increased density in the latter, since in the receiving area there might be denser development compared to the ordinary density in the sending area".

This mechanism could help finance the reduction of undeveloped building zones in rural areas and increase the availability of well-connected building zones in urban areas, since landowners in rural municipalities could sell their development rights to property owners in urban municipalities. To date the principle of TDR has not yet been applied in Switzerland, but the instrument has gained more political acceptance and may be implemented in the future (Institut für Wirtschaftsstudium Basel, 2016).

2.4. Planning evaluation

The current discussions which aim to find new instruments to manage urban growth more efficiently are highly valuable. Yet a wide range of growth-management policies have been present in Switzerland for over four decades. Although spatial planning has been criticized for not having been able to manage urban growth and prevent urban sprawl in the past decades (Muggli, 2014), Hersperger and Cathomas (2015) showed that positive examples of a successful compact urban development do exist at local scale. In particular, they revealed that several municipalities—located in different regions of the country, ranging from small villages to large cities—have succeeded in steering their urban development towards compact urban forms by using well-established growth-management policies such as special district plans (*Sondernutzungspläne*), minimum utilization densities (*minimale Ausnützungsziffer*), the reclassification of building zones into non-building zones (*Rückzonungen*), and urban growth boundaries (*Sieldungsgebietsfeststelung*). It is therefore crucial to assess the quality, effectiveness and use of existing policies in order to identify further examples of best practice, improve existing planning processes and policies, and guide future policy decisions.

2.4.1. Aim and relevance of planning evaluation

Evaluation plays a key role in this context, because it improves decision-making, fosters continuous learning, and increases the legitimacy of planning activities—both at local and higher levels of government (Guyadeen & Seasons, 2016). In line with Guyadeen and Seasons (2016), Cousin and colleagues (2014) suggested that planning evaluation has two main functions: (1) improving government management, and (2) promoting accountability by informing decision makers, taxpayers, and the general public about the effectiveness of government planning initiatives.

Regarding the improvement of government management, evaluation can "act as a source of information and knowledge by enabling planners to examine prior strategies, obtain a clear sense of how existing or historical initiatives performed and determine the applicability to their situation" (Guyadeen & Seasons, 2016, p. 217). In the context of spatial planning in Switzerland, evaluation could help planners understand why some municipalities have succeeded at increasing the density of their built-up areas and limiting their urban expansion, where others have failed to reach these goals. For example, planning evaluation may allow the identification of effective growth-management policies, improving the implementation of these policies and developing new instruments that are more effective in tackling urban sprawl.

In contrast to this first function of planning evaluation—which is primarily aimed at the planners themselves—the second function, i.e., the promotion of accountability, is rather directed towards the sponsors and beneficiaries of planning activities (e.g. the general public, taxpayers and decision makers). Government planners need to justify their decisions and demonstrate the benefits of their efforts, since they are responsible for furthering the common good and use public funds to reach their goals (Waldner, 2004). In this context, planning evaluation is useful to increase the legitimacy of planning and improve citizens' understanding and recognition of its added value (Oliveira & Pinho, 2010). Planning evaluation has gained attention since the 1990s, particularly in local governments, under the influence of the New Planning Management (NPM) movement, which calls for an improvement of public activities and policies through increased evaluation and performance measurements (Gerber, 2016; Guyadeen & Seasons, 2016; Mueller & Hersperger, 2015).

2.4.2. Measuring success in planning: main approaches and challenges

Evaluation can be carried out during three phases of the planning process: (1) *ex ante* evaluation occurs at the beginning of the process to compare possible alternatives and choose the most suitable solution to steer urban development; (2) *ongoing* evaluation takes place during the planning process and aims to adapt policy decisions and policies according to changes in the planning context, and (3) *ex post* evaluation is used at the end of the planning process to determine whether planning was successful and whether plans and policies achieved their expected outcomes (Oliveira & Pinho, 2010).

The planning literature also distinguishes between evaluating the outputs and the outcomes of the planning process (Laurian et al., 2010). Outputs can be described as the plans, policies and decisions produced directly by planning efforts, whereas outcomes are the impacts of the planning process and its outputs on planning actors and land-use development (e.g.. an increase in the density of built-up areas, or a change in land-use patterns) (Mandarano, 2008). Over recent decades much attention has been paid to assessing planning outputs. For example, Brody and colleagues (Brody, Carrasco, & Highfield, 2006) measured the adoption of growth-management policies such as conservation easements and density bonuses in Florida (USA), Talen and Knaap (2003) examined the prevalence of similar policies in Illinois (USA), and more than 45 studies evaluated the quality of local plans in countries including the USA, Canada, New-Zealand, Australia, the UK and Holland (Berke & Godschalk, 2009; Lyles & Stevens, 2014).

In contrast, the literature dedicated to assessing the outcomes of the planning process is much more sparse (Guyadeen & Seasons, 2016; Laurian, et al., 2010). Evaluating planning outcomes is challenging, mainly because of the methodological issue of *multicausality* (Talen, 1996)—also described as the *attribution* or *causality* question (Laurian, et al., 2010)—which refers to the difficulty of distinguishing the outcomes of the planning activity from other factors (Carmona & Sieh, 2004). In fact, planning outcomes often do not only result from the implementation of plans and policies, but may also be influenced by multiple other factors such as political, legal and financial constraints. It is therefore difficult to identify causal relationships between planning documents and outcomes (Seasons, 2003), especially since planning documents are tailored to a specific situation and evaluation cannot always rely on replicated intervention or control groups (Laurian, et al., 2010). Resultantly, there is little agreement about what constitutes successful planning and there is no consensus on how to measure implementation success (Kinzer, 2016).

Two main approaches currently prevail in characterizing and assessing planning successes: a conformance and a performance approach (Alexander & Faludi, 1989; Guyadeen & Seasons, 2016; Lyles, Berke, & Smith, 2016; Oliveira & Pinho, 2010). The conformance approach considers that the prescriptions of plans and policies should be reflected in actual development (Laurian et al., 2004; Mastop & Faludi, 1997; Talen, 1997). In this case planning is deemed successful if (1) policies and plans are carried out, and/or (2) they influence planning outcomes on the ground (Alexander & Faludi, 1989; Oliveira & Pinho, 2010). For example Lyles and colleagues (Lyles, et al., 2016) followed the conformance approach to study whether local plans were successful at promoting hazard mitigation in the USA. To this purpose they analysed the content of more than 100 local plans and recorded which policies they contained to mitigate natural hazards. In a second step, they addressed a questionnaire to local planning officials and asked them whether plans' policies had been completed. They considered plans successfully implemented if most of their policies had been completed. Alternatively, Loh (2011) performed a GIS-based comparison of planned and actual land-uses to assess plan conformance in four municipalities in Michigan (USA). She considered plans as successfully implemented if existing and planned land-uses corresponded (e.g., agricultural use vs. agricultural land), whereas she considered plans not successfully implemented when existing and planned land-uses did not correspond (e.g., urbanized use vs. agricultural use).

Alternatively, the performance approach focuses more specifically on the planning process and considers plans successfully implemented if they are read and are useful in supporting decision-making, regardless of whether they influence planning outcomes on the ground (Faludi, 2000; Mastop & Faludi, 1997). Norton (2005) used this approach in North Carolina, and conducted telephone and postal surveys with local elected officials to assess whether local plans influenced their policy decisions, such as the adoption of new ordinances or capital improvement programmes.

The previous paragraphs have demonstrated that planning evaluation is complex, and that the methods and approaches dedicated to assessing the outcomes of the planning process are highly debated in planning literature. In this doctoral dissertation, *ex post* evaluation is used to assess the use and the quality of two specific outputs of the planning process: growth-management policies and plans. In a further step, the outcomes of local plans are assessed using both performance and conformance approaches, in order to evaluate whether local plans are efficiently implemented in Switzerland.

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CHAPTER 3: PLANNING FOR COMPACT URBAN FORMS: LOCAL GROWTH-MANAGEMENT APPROACHES AND THEIR EVOLUTION OVER TIME (PAPER I)

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Submitted to *Journal of Environmental Planning and Management* and currently in revision (minor revisions received in December 2016)

Abstract: Urban growth is a key issue for spatial planning as it influences urban patterns and disrupts open landscapes. To effectively steer urban growth towards compact urban forms, many growth-management policies have been developed over recent decades. However, few studies have assessed how municipal policy mixes have evolved over time. In our representative Swiss-wide survey we evaluated the prevalence and the time of introduction of 18 policies. Our results indicate that large municipalities use a broad range of reinforcing policies over decades. In contrast, small municipalities mostly rely on conventional land-use regulations. The lack of innovative, incentive-based policies casts doubt on small municipalities' ability to effectively manage urban growth. However, our analyses reveal recent efforts by small municipalities to diversify approaches to growth-management and adopt innovative policies. These efforts should be supported by guiding small municipalities in their policy choices, and providing support to those lacking planning capacity.

Keywords: urban growth; local land-use planning, growth-management policies; planning capacity; Switzerland

3.1. Introduction

Urban growth increasingly poses serious challenges to sustainable environmental management (Antrop, 2004; Hamidi & Ewing, 2014; Llausàs, Buxton, & Beilin, 2016; Slemp et al., 2012). Valuable farmland is lost, natural ecosystems are disrupted, and infrastructure costs are inflated. Moreover, intensified commuting increases traffic congestion and pollution (Ewing, 2008; Hortas-Rico & Solé-Ollé, 2010).

Compact urban forms—characterized by clear boundaries, high population densities and mixed land uses—are commonly presented as effective solutions to accommodate urban growth since they preserve adjacent landscapes (Burton, Jenks, & Williams, 2003; Grant, 2006; Ye, Mandpe, & Meyer, 2005). In Europe, such compact urban forms are promoted by the "Compact City" model (Dieleman & Wegener, 2004; Jabareen, 2006), and in the USA by "New urbanism" and "Smart Growth" movements (Grant & Tsenkova, 2012; Knaap & Talen, 2005). Downs (2005, p. 368) identifies six main principles of *Smart Growth*: (1) restricting urban extension, (2) increasing urban density, (3) encouraging mixed land uses and pedestrian-friendly urban designs, (4) redistributing the costs of new development to land consumers, (5) promoting public transportation, (6) and revitalizing existing urban areas. In line with these principles, growth-management policies have been developed worldwide.

While growth-management policies are manifold, they all aim to steer the location, timing and quality of urban development. These policies can be grouped into distinct growth-management approaches depending on their effect on urban development and their implementation mechanism. Municipalities should rely on several reinforcing growth-management approaches, since single approaches may have unintended consequences (Bengston, Fletcher, & Nelson, 2004). For example, it is recognized that conventional zoning may lead to social inequities, and often correlates with low urban densities, single land-uses and urban sprawl (Levine, 2005; Talen, 2013). As a result, planning scholars advocate supporting conventional zoning and other traditional growth-management policies with more innovative and incentive-oriented measures (see Gerber, 2016). Consequently, it is crucial to understand whether municipalities appropriately combine policies in order to assess whether they are prepared to effectively steer their urban development towards compact urban forms.

Previous studies have concluded that growth-management approaches vary spatially and depending on the type of policy (Brody, Carrasco, & Highfield, 2006; Edwards & Haines, 2007; Talen & Knaap, 2003). However, data on the evolution of growth-management policies are very rare at the local level (McLaughlin, 2012). A notable exception can be found in Glaeser and Ward (2009), who investigated the adoption of four policies over time and observed that they all increased dramatically.

Various factors explain why municipalities engage in growth management, ranging from demographic and geographical constraints to politics (Lewis & Neiman, 2002). According to the "Property rights model", municipalities adopt growth-management policies to prevent the depletion of public goods (Libecap, 1993; Lubell, Feiock, & Ramirez De La Cruz, 2009). However, even though a shortage of open land or public infrastructures may trigger the policy discussion, growth-management policies remain primarily the result of political debate. Consequently, the "Interest groups model" postulates that the adoption of policies depends on the outcome of the competition among different interest groups who bargain to maximize their property rights

(Lubell, et al., 2009; Ramírez De La Cruz, 2009). More recently, scholars have acknowledged that the kind of policies adopted by municipalities also depends on local political institutions (e.g., Feiock, Tavares, & Lubell, 2008; Lubell, et al., 2009; Ramírez De La Cruz, 2009) and planning capacity (Brody, et al., 2006; Göçmen & LaGro Jr, 2015; Hawkins, 2014). Moreover, several analyses have revealed that larger municipalities use significantly more policies than their smaller counterparts (e.g., Feiock, et al., 2008; O'Connell, 2009; Ramírez De La Cruz, 2009). In response to the lack of research focusing on rural areas, there have been some attempts to study growth-management policies specifically in rural settings (Edwards & Haines, 2007; Locke & Rissman, 2015). However, most of the abovementioned studies have been conducted in the USA and have not assessed the evolution of growth-management approaches over time.

The goal of the present study is, therefore, to examine the prevalence of growth-management policies in a large sample of small to large Swiss municipalities, to analyse the evolution of their introduction over the past decades, and to explore the link between the growth-management policies in place, population size and planning capacity. We build our study on a unique dataset, which provides information about the time of introduction of 18 growth-management policies. Switzerland represents a promising case to gain knowledge on the issue of growth-management, since urban growth has dramatically increased in recent decades and represents a challenge for municipalities far beyond the borders of main urban centres (Jaeger & Schwick, 2014; Mann, 2009).

The paper is organized as follows. Section two briefly presents the Swiss planning system, and section three describes how we have classified growth-management policies into distinct growth-management approaches. Section four introduces data collection, sampling and analytical techniques, while section five presents our main results. Section six discusses our main findings and section seven concludes with recommendations for science and practice.

3.2. Spatial planning in Switzerland

Most of Switzerland's population, infrastructure and agriculture are concentrated on just one third of the overall territory (42,000 km^2) because of the country's mountainous character. This region, known as the Central Plateau, is highly urbanized. The Swiss urban system is nevertheless polycentric, consisting mainly of small or medium-sized cities (VLP-ASPAN, 2012). About 65% of Swiss municipalities have fewer than 2,000 inhabitants, and even Zürich, the country's largest city, has only 370,000 inhabitants (2010). About 39% of the population lives in municipalities classified as medium-sized (2,000 – 9,999 inhabitants), 28% – large (10,000 – 49,999 inhabitants), 17% – very large (> 49,999 inhabitants), and 16% – small (< 2,000 inhabitants).

The Swiss spatial planning system is shaped by the country's federalist government structure, where power is distributed between the federal state, 26 cantons and 2,495 municipalities (Mueller & Hersperger, 2015). These three institutional levels are jointly responsible for spatial planning, but have distinct areas of responsibility. The federal government specifies the framework legislation and coordinates the spatial planning activities of the cantons (VLP-ASPAN, 2012). Individual cantons are in charge of spatial planning on their territory. They enact cantonal laws on spatial planning and cantonal comprehensive plans (*Richtpläne*) to steer future spatial

development. Most cantons delegate the responsibility of specifying how land should be used to municipalities. These hold, therefore, the greatest decision-making power regarding local development (Mann, 2009).

The basic instrument of municipal spatial planning is the land use plan (*Nutzungsplan*), binding to landowners, and its associated building ordinance (*Baureglement*). Land use plans specify the boundaries between building and non-building zones, which is a key element of spatial planning in Switzerland. In addition to the land use plan, municipalities can develop other instruments such as municipal comprehensive plans[1] (*kommunale Richtpläne*). Only municipal land use plans and building ordinances are required by law for all municipalities.

Municipal authorities are key actors in spatial planning (Hersperger, Franscini, & Kübler, 2014). In large municipalities, authorities can usually rely on well-organised administrative units. Small municipalities often have less planning capacity due to the lack of specialists in their administration and to a high turnover among politicians, at both executive and legislative levels.

3.3. Classification of growth-management policies into growth-management approaches

We studied growth-management policies that are widely used throughout Switzerland but not required by national law. For their selection, we relied on several sources related to Swiss planning: reference books (Gilgen, 2006; Gilgen, 2012), specialised publications (i.e., Bühlmann & Perregaux DuPasquier, 2013; Weidmann, 2014) and case studies on growth-management policies at the municipal level (Haag, 2006; Stauffiger, 2006). The resulting selection of 18 growth-management policies ranges from specific instruments (e.g., municipal comprehensive plans, masterplans) to measures that must be implemented within broader planning programmes (e.g., measures against land hoarding, density bonuses). A detailed description of the 18 policies is available in supplementary material 3.A.

For this analysis, these growth-management policies were classified according to their growth-management approach, taking into consideration their intended impact on urbanisation. Our classification is adapted to Switzerland but well embedded within the internationally accepted principles of the "Compact city", "New urbanism" and "Smart growth" movements (e.g., Downs, 2005; Grant & Tsenkova, 2012; Jabareen, 2006). Building on a Swiss Federal Office for Spatial Development report (ARE, 2009), four mutually exclusive growth-management approaches were derived: conceptual instruments, land-use regulations, land management measures and quality-oriented measures (Fig.3.1). In the following paragraph, we identify the mechanism used to implement the policies. For this purpose, we refer to Nuissl and Couch (2007) and distinguish between regulations and economic intervention or management.

Conceptual instruments provide an overview of current spatial development, describe future objectives and explain how the municipality plans to attain and coordinate them. More concrete instruments are required to implement their prescriptions. *Land-use regulations* precisely define where specific land uses are acceptable and under what conditions. They aim to contain urban development and increase its density, and attempt to steer

[1] In paper I, the *kommunaler Richtplan/plan directeur communal* is called *municipal comprehensive plan*, whereas it is called *local plan* in papers II and III

new development to appropriate locations. They are implemented through top-down regulations backed by negative sanctions in case of non-compliance. *Land management measures* also address densification, containment and steering of urban development. However, they aim to tackle planning inefficiencies attributed to land-use regulations by managing urban growth instead of by strictly controlling it. They also intend to redistribute the costs and benefits created through planning measures. Land management measures encourage compliance to policy goals using innovative implementation mechanisms, such as economic intervention (e.g., incentives, direct investment) and management (e.g., participatory planning approaches). Finally, *quality-oriented measures* aim to enhance the quality of residential environments in order to increase quality of life and foster acceptance of densification processes. They are also implemented through economic intervention and management.

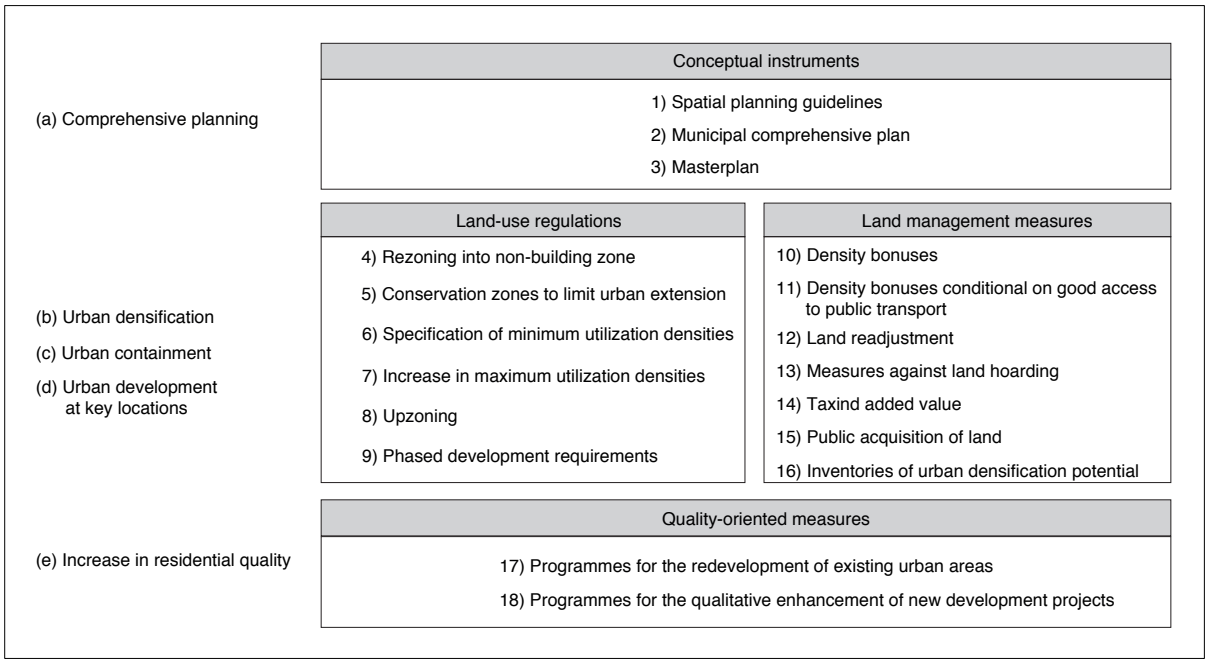

Figure 3.1. Growth-management policies are classified into four growth-management approaches, according to their impact on urban development. The five principles of compact urban development defined by the Swiss Federal Office for Spatial Development are listed next to the corresponding growth-management approaches. A detailed description of the policies is provided in supplementary material 3.A.

3.4. Research design and methods

3.4.1. Survey questionnaire development and administration

We developed a questionnaire addressed to Swiss municipalities to collect data on the introduction of 18 local growth-management policies and on planning capacity. In the questionnaire, respondents first indicated whether each of the 18 policies were in place in their municipality at the time of the survey (2014). For policies that were in place, respondents were then asked to specify the decade in which the policies in question had been introduced. The decade 1970-1979 was chosen as the starting point because it lies before the enactment of the Federal Law on Spatial Planning in 1980. To measure planning capacity, respondents were asked to indicate whether or not their municipality had an administrative unit dedicated to spatial planning tasks.

We addressed our questionnaire to the main spatial planning officer. When the municipality had no planning officer, we sent our questionnaire to the main municipal clerk. We excluded the 45 municipalities in the canton of Geneva from our study since they have almost no decision-making power with respect to spatial planning. The questionnaire was translated into the three main Swiss languages (i.e., German, French and Italian). A glossary was also developed to precisely define the planning terms and their synonyms used in different Swiss regions.

In February 2014, we sent an e-mail with a link to the online questionnaire to all municipalities, followed by an e-mail reminder five weeks later. In April 2014, a printed version of the questionnaire was sent to municipalities that had not completed the online survey. The survey was finally closed in June 2014. In total, 1,312 online and 307 printed questionnaires were completed, with a response rate of about 70%.

3.4.2. Sampling procedure

Since the size of municipalities is rather unevenly distributed (many small municipalities, few large ones), we performed a stratified random sampling with proportional allocation (Gregoire & Valentine, 2008). This ensured that the sample encompassed municipalities of 1) all population sizes and 2) all types (centres, suburban and rural municipalities). To define classes of population size, we relied on previous work from Steiner and Kaiser (2013) and used the following classes: very large (> 49,999 inhabitants), large (10,000 – 49,999 inhabitants), medium-sized (2,000 – 9,999 inhabitants) and small (< 2,000 inhabitants) municipalities. To determine municipality types, we built upon a typology developed by the Swiss federal administration to classify municipalities according to morphological and functional characteristics (Goebel and Kohler, 2014). This resulted in eight sampling strata: very large centres, large centres, medium-sized centres, small centres, medium-sized suburban, small suburban, medium-sized rural, and small rural municipalities. Subsequently, we randomly selected in each stratum 25% of the municipalities. However, for very large centres, we included all 8 municipalities that returned a questionnaire in our sample.

Since preliminary analyses indicated that the type of municipality (i.e., centres, suburban, rural) had little effect on the amount and kind of growth-management policies used (see supplementary material 3.B for details), we then aggregated the categories of medium-sized municipalities, as well as the categories of small municipalities. Our final sample contains 630 municipalities split into 8 very large, 36 large, 180 medium-sized and 406 small municipalities. Except for very large municipalities, this sample is representative of the distribution of municipalities in Switzerland, including 25% of all municipalities within each size scale across the country. Sampled municipalities are evenly distributed across the three main geographical regions of the country (Fig. 3.2).

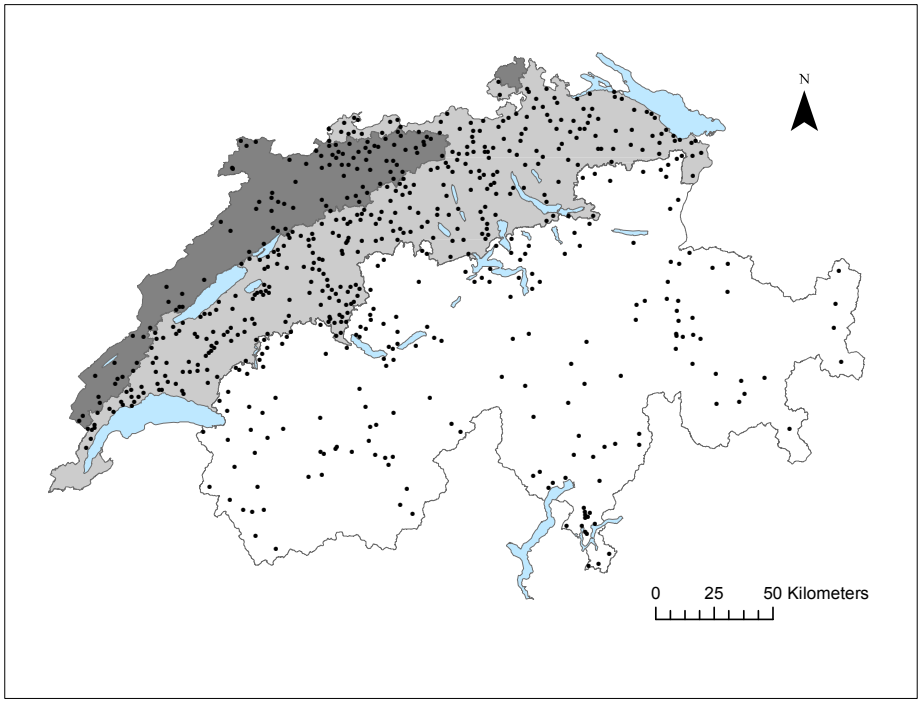

Figure 3.2. Distribution of the 630 sampled municipalities in the three main geographical regions of Switzerland (dark grey: Jura Mountains, light grey: Central Plateau, white: Alps). The sampling density is highest in the Central Plateau since most of the municipalities are concentrated in the lowlands.

3.4.3. Analysis

3.4.3.1. Influence of population size on the number of growth-management policies in place in 2014 and on planning capacity

We performed a Kruskal-Wallis test to assess the influence of population size on the number of growth-management policies in place in 2014. This procedure is a rank-based nonparametric test suitable for more than two independent samples (Conover, 1999). Next, a post-hoc analysis was carried out to evaluate pairwise comparisons according to Dunn (1964), including a Bonferroni correction for multiple comparisons.

We conducted a Fischer's exact test to evaluate the influence of population size on planning capacity (Agresti, 2013). This test was selected because our contingency table contained cells with small expected cell counts. We used the R function *fisher.test* in the *stats* package (R core team, 2016), which allows the Fischer's exact test to be adapted to contingency tables larger than 2x2, based on the work of Mehta and Patel (1986) and Clarkson, Fan, and Joe (1993). Subsequently, we conducted a post-hoc analysis by performing 2x2 Fischer's exact tests for each pairwise comparison with a Bonferroni correction (McDonald, 2014).

3.4.3.2. Growth-management approaches

To assess local growth-management approaches, we determined the extent to which municipalities had used the policies included in each growth-management approach, as of 2014. The *proportion of policies in place in 2014* variable was standardized, since the number of policies included in growth-management approaches varied from

N = 7 for land management measures, to N = 2 for quality-oriented measures. This was achieved by calculating the median number of policies in place in 2014 for each growth-management approach. We then divided these figures by the total number of policies included in the corresponding growth-management approach and then multiplied by 100, placing each of them on a scale from 0 to 100%. This allowed for the comparison of the proportion of policies in place of each growth-management approach.

We performed a Friedman test to determine whether there were significant differences in the use of growth-management approaches. The Friedman test is a rank-based nonparametric procedure that is well adapted to the analysis of more than three related samples (Conover, 1999). Subsequently, we conducted a post-hoc analysis according to Nemenyi's procedure for multiple joint samples (Demšar, 2006). Calculations were performed with the R function *posthoc.friedman.nemenyi.test* in the *PMCMR* package (Pohlert, 2014). This procedure was followed for the overall sample, and for each municipality category (i.e., very large, large, medium-sized and small municipalities). It should be noted that for very large municipalities, the small sample size (N = 8) could contribute to the low number of significant differences among growth-management approaches. This is given the fact that statistical power is reduced in case of small sample size, thereby increasing the risk of Type II errors (failure to detect a difference that is present).

3.4.3.3. Evolution of growth-management approaches

For each growth-management approach, we determined when the policies that were in place in 2014 had been introduced. For this purpose, we calculated the proportion of policies that were introduced during each of the five decades from the 1970s to the 2010s (up to the year 2014) out of the total number of policies that were in place in 2014. The *proportion of policies introduced* variable was also standardized to allow for meaningful comparisons across growth-management approaches. This was done by calculating—for each growth-management approach and each municipality category—the number of policies that were introduced in each decade, dividing these sums by the total number of policies, and multiplying by 100 to place them on a scale from 0 to 100%.

3.5. Results

3.5.1. Influence of population size on the number of growth-management policies in place in 2014 and on planning capacity

The median number of policies in place in 2014 amounted to five in the overall sample, out of a total of 18 policies considered in the analysis (Fig. 3.3.). However, the number of policies varied greatly among municipalities, from 0 to 17. The large interquartile range in the corresponding boxplot further confirms the high variability of the number of policies in place.

The median number of policies decreased with decreasing municipality population size, from very large (11 policies) to large (10), medium-sized (7) and small municipalities (4). Tests confirmed significant differences between these four categories of municipalities ($\chi^2(3) = 147.45$, $p < 2.2e^{-16}$). In particular, they revealed

statistically significant differences between the following categories of municipalities: very large and small (p = 1.5e-5), large and medium-sized (p = 3.8e-4), large and small (p < 2e-16), and medium-sized and small (p < 2e-16).

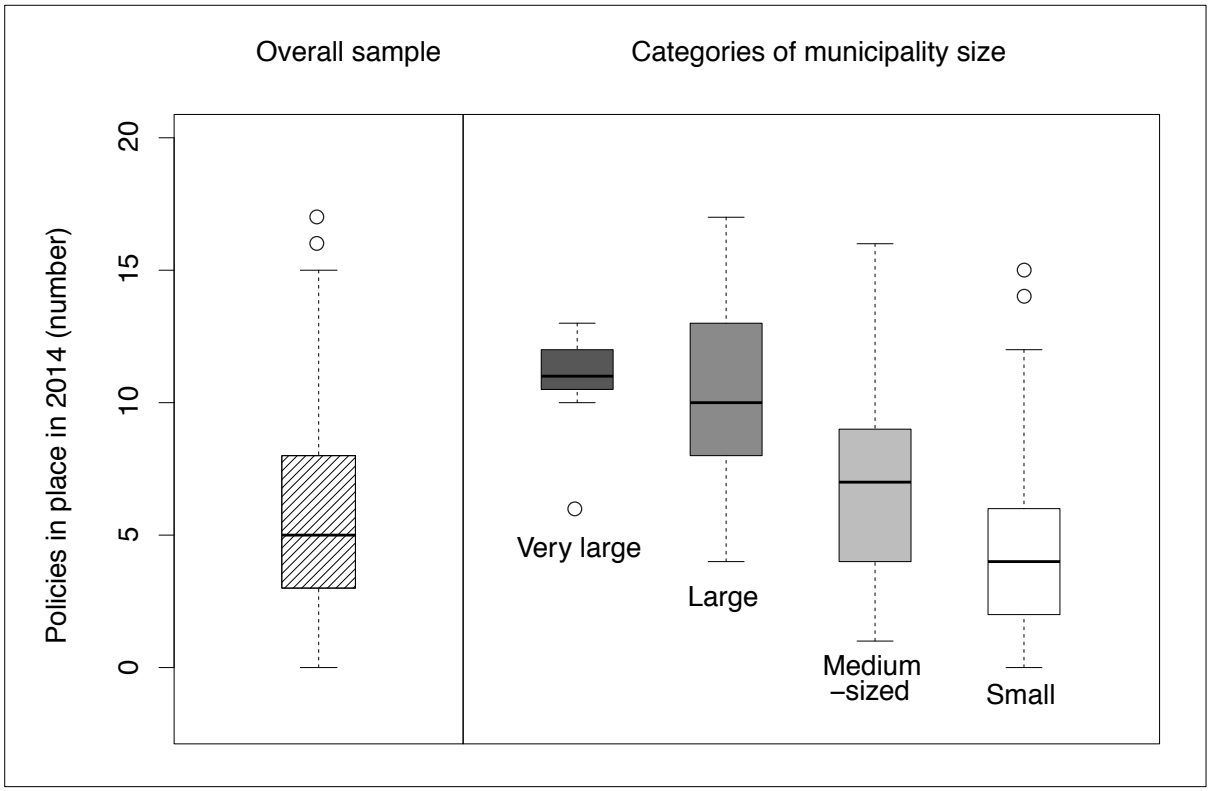

Figure 3.3. Distribution of the number of policies used by municipalities in the overall sample and in each category of municipality size, in 2014. Eighteen policies were considered in the analysis. The median number of policies in place decreased from very large to small municipalities.

The proportion of municipalities with administrative planning units was highest for very large municipalities (100% had planning units) and decreased with decreasing population size, from 92% for large municipalities to 66% for medium-sized and 19% for small municipalities. A global test confirmed significant differences between municipality size categories (p < 2.2e-16). Pairwise comparisons revealed significant differences between the following categories: very large and small (p = 2.4e-16), large and medium-sized (p = 0.01) large and small (p < 2.2e-16), and medium-sized and small municipalities (p < 2.2e-16).

3.5.2. Growth-management approaches

In 2014, Swiss municipalities have mostly relied on conceptual instruments (standardized median number of growth-management policies in place = 33%, which means that 1 out of 3 conceptual instruments was in place in an average municipality) and land-use regulations (median = 33%) to steer their urban development (Fig. 3.4, overall sample). In contrast, land management (median = 14%) and quality-oriented measures (median = 0%) were infrequently used. Tests confirmed a significant difference between the four growth-management approaches ($\chi^2(3) = 207.48$, $p < 2.2e^{-16}$) and revealed that most pairwise differences were statistically significant (see horizontal bars in Fig. 3.4). In particular, they confirmed that municipalities used significantly higher

proportions of land-use regulations (33%) than land management measures (14%) (p = 2.9e-14). The proportion of policies used within each growth-management approach varied widely among municipalities, as indicated by the large inter-quartile ranges and long whiskers in boxplots.

Growth-management approaches varied from very large to small municipalities (Fig. 3.4). Tests confirmed significant differences between growth-management approaches in all municipality size categories ($\chi^2(3) = 14.5$, $p = .002$ for very large municipalities, $\chi^2(3) = 30.9$, $p =$ 9e-7 for large municipalities, $\chi^2(3) = 78.3$, $p <$ 2.2e-16 for medium-sized municipalities, and $\chi^2(3) = 7154.5$, $p <$ 2.2e-16 for small municipalities) and revealed several significant differences between pairs of growth-management approaches (see horizontal bars in Fig. 3.4).

Very large municipalities used conceptual instruments and quality-oriented measures (median proportion = 100%) to a high degree, while using less frequently land-use regulations (50%) and land management measures (43%). Tests reported no significant difference between the proportion of land-use regulations and land management measures in place. Large municipalities used conceptual instruments (100%), land-use regulations (50%) and land-management measures (43%) similarly to very large municipalities. However, they used a smaller proportion of the quality-oriented measures (50%). Medium-sized municipalities used a rather high proportion of the conceptual instruments (67%) and a moderate proportion of the land-use regulations (50%) and the quality-oriented measures (43%). In contrast, they used fewer land management measures (29%). Tests confirmed that medium-sized municipalities used significantly higher proportions of land-use regulations than land management measures (p = 8.7e-6). Finally, small municipalities used much higher median proportions of conceptual instruments (33%) and land-use regulations (33%) than land management (14%) and quality-oriented measures (0%). As was found for medium-sized municipalities, they used significantly higher proportions of land-use regulations than land management measures. Boxplots for conceptual instruments and quality-oriented measures indicate that distributions are highly skewed (i.e., their median values often coincide with their upper or lower quartile). This is because the number of policies included in these two approaches was very low (N = 3 for conceptual instruments and N = 2 for quality-oriented measures).

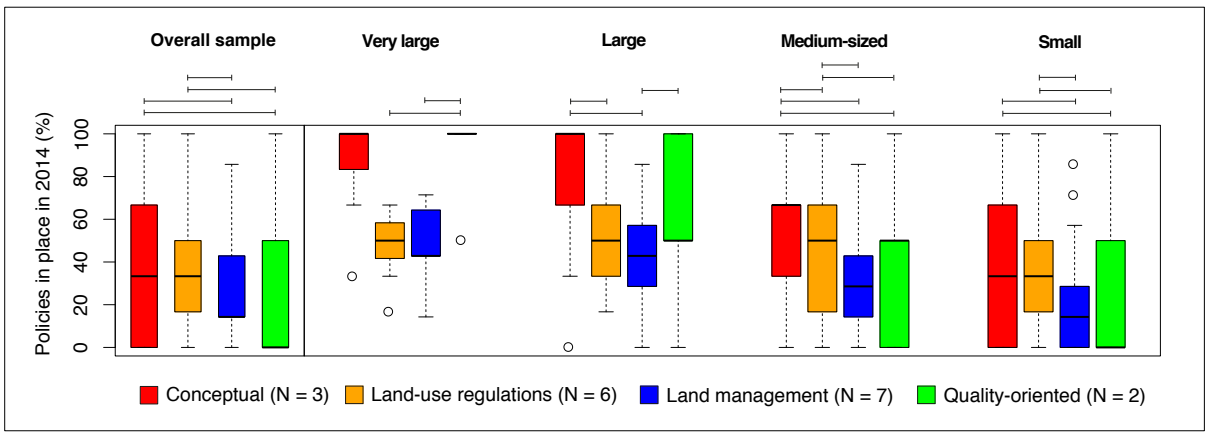

Figure 3.4. Proportion of policies used for each growth-management approach, in the overall sample and in each municipality size category, in 2014. For example, very large municipalities used 100% of the conceptual instruments included in the study (median), 50% of the land-use regulations, 40% of the land management measures and 100% of the quality-oriented measures. Horizontal bars represent significant differences between growth-management approaches (Nemenyi post-hoc test for multiple joint samples, $p \leq .05$). (N = number of policies included in each growth-management approach).

3.5.3. Evolution of growth-management approaches

The development of growth-management approaches varied over time among different municipality size categories (Fig. 3.5). Very large municipalities started introducing policies earlier than other municipalities. About 24% of the land-use regulations and 14% of the land management measures that were in place in 2014 had already been introduced before 1980. All planning approaches reached their introduction peak in the course of the 1990s and 2000s.

Large municipalities, in contrast, introduced small proportions of policies until the 1990s. Between 1990 and 2014, the proportion of the introduced conceptual instruments remained more or less constant (about 30% of the introduced policies in each decade), while most land-use regulations and land management measures were introduced between 2010 and 2014. The evolution of quality-oriented measures showed a slightly different pattern. This approach developed later and most of its policies were introduced in the 2000s (41% of the introduced policies), before showing a slight decline between 2010 and 2014 (33%). Medium-sized municipalities also introduced low proportions of policies until the 1990s. Between 1990 and 2014, the proportion of the introduced conceptual instruments and land-use regulations increased steadily. The same holds true for land management and quality-oriented measures until 2010, at which time the proportion of policies that were introduced in these two growth-management approaches increased dramatically (54% and 55%, respectively). In other words, half of the land management and quality-oriented measures that were in place in 2014 had been introduced within the previous 4 years. Finally, small municipalities present distinct trends for the different growth-management approaches. Conceptual instruments and land-use regulations started being introduced in the 1980s, and the largest proportions of these policies were introduced in the 2000s for conceptual instruments (33% of the policies were introduced in this time period) and between 2010 and 2014 for land-use regulations (36%). While land management and quality-oriented measures were introduced later, their introduction increased dramatically between 2010 and 2014 (50% and 55%, respectively, were introduced in this time period).

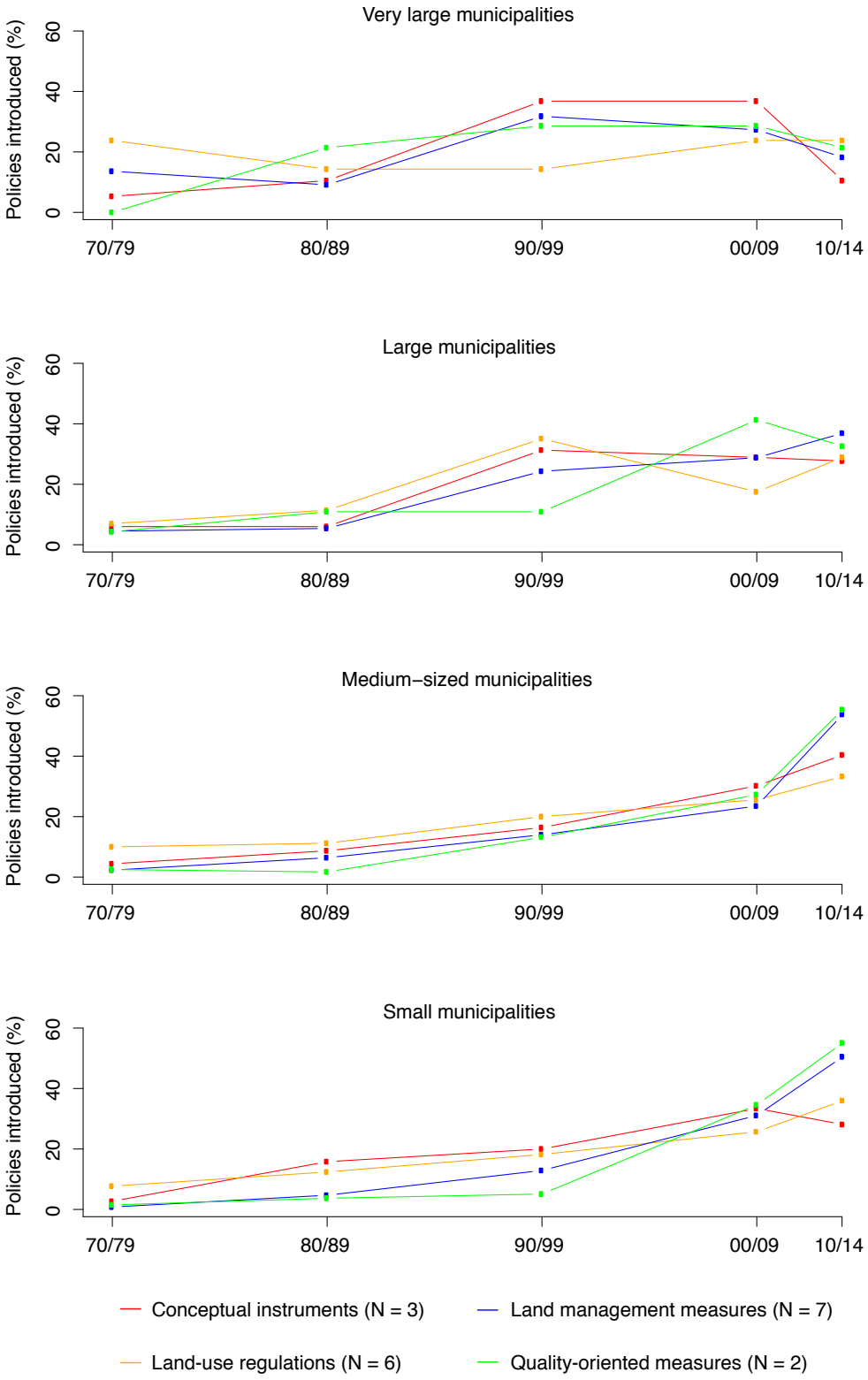

Figure 3.5. Proportion of introduced policies for municipality size categories along five time periods and for each growth-management approach (conceptual instruments, land-use regulations, land management measures, quality-oriented measures). 100% indicates the total number of policies in place in 2014 for each municipality size category and each planning approach. For example, in very large municipalities, 5% of all conceptual instruments in place in 2014 were introduced between 1970 and 1979, an additional 10% between 1980 and 1989, an additional 37% between 1990 and 1999, an additional 37% between 2000 and 2009, and an additional 11% between 2010 and 2014. (N = number of policies included in each growth-management approach).

3.6. Discussion

3.6.1. High variation in growth-management approaches based on municipality size

Our analysis shows that growth-management approaches vary widely from small to large municipalities, with large and very large municipalities using more diversified approaches than their smaller counterparts. They use a very high proportion of the range of conceptual instruments and quality-oriented measures, which provide them with a valuable basis to tackle the complexity of present planning challenges. Indeed, municipal comprehensive plans and masterplans allow municipalities to coordinate planning tasks over the long term. In addition, programmes for the redevelopment of existing urban areas and the qualitative enhancement of new development projects demonstrate the rising importance attached to building quality. Moreover, very large and large municipalities use similar proportions of land-use regulations and land-management measures. This indicates that although innovative policies implemented through economic intervention (e.g., incentives) and management (e.g., participatory planning) have increased over the past decades, they have not replaced traditional land-use regulations, but have rather supplemented them. This finding is in line with Gerber (2016) conclusions, based on interviews conducted in 19 Swiss cities. He found that the recent changes towards more management-oriented land-use planning have affected local practices, but without replacing traditional growth-management approaches. In contrast, medium-sized and small municipalities seem to rely mainly on well-established growth-management approaches to steer their urban development, such as conceptual instruments and land-use regulations (e.g., specification of minimum utilization densities, designation of conservation zones). Smaller municipalities are much more reluctant to use innovative land-management and quality-oriented measures that are implemented through economic intervention and management. This might compromise their ability to efficiently promote compact urban forms.

Two main factors may explain why medium-sized and small municipalities favour conceptual instruments and land-use regulations. First, these growth-management policies have a long tradition in urban planning practices (Chapin, 2012; Nuissl & Couch, 2007; Porter, 2008). In Switzerland, land use plans were made compulsory for all municipalities when the 1979 Swiss Federal Law on Spatial Planning came into force (Gilgen, 2012). New policy instruments with broader policy goals and more emphasis on incentive-based approaches and stakeholder participation have been developed more recently (Bengston, et al., 2004; Chapin, 2012; Nuissl & Couch, 2007). In Switzerland, this paradigm shift took place mostly in the 1990s (Hersperger, et al., 2014). Second, the role of professional planners has evolved together with the development of these new growth-management approaches. Earlier growth-management policies relied mostly on specific rules and requirements, and planners were considered mainly as technical experts (Gilgen, 2012; Hawkins, 2014). The emergence of more incentive-oriented and participatory growth-management approaches (e.g., density bonuses) has led to the redistribution of costs and benefits of urban development among stakeholders, which has increased the potential for dispute (Downs, 2005). During recent decades, planning has therefore become a more complex task and planners have increasingly been assigned the role of mediators between opposing interest groups (Hawkins, 2014). Incentive-oriented and participatory growth-management approaches, therefore, require better trained municipal planning staff (Hawkins, 2011; Hawkins, 2014). This is often beyond the capacity of medium-sized and small municipalities and may account for their reluctance to use innovative growth-management policies.

The fact that most medium-sized and small municipalities do not use diversified growth-management approaches is particularly worrying since they represent about 95% of the countries' municipalities. This suggests that most Swiss municipalities are not prepared to efficiently steer their urban development towards compact urban forms.

3.6.2. Recent dramatic increase in land management and quality-oriented measures

The present study clearly shows that land-management and quality-oriented measures have already been introduced in large and very large municipalities for some decades. Gerber (2016) argues that such growth-management approaches—implemented through economic intervention and management—have been encouraged since the mid-1990s by the introduction of New Public Management reforms in municipal administrations. However, this managerial turn mainly occurred in municipalities of more than 10,000 inhabitants, while small municipalities did not apply these principles extensively (Steiner & Ladner, 2006).

Nevertheless, our analysis reveals that the introduction of these growth-management approaches by medium-sized and small municipalities has increased dramatically since 2010. This clearly indicates that smaller municipalities have recognized the need to use more diversified growth-management approaches to efficiently steer their urban development. This shift towards more incentive-oriented and participatory growth-management approaches has occurred because the Swiss planning context has changed in the course of recent years (Bühlmann & Perregaux DuPasquier, 2013; Gerber, 2016). In fact, the increasing number of issues related to the low-density extension of urban areas prompted a major revision of the Swiss Federal Law on Spatial Planning in 2013. The revised law clearly sets the focus on infill redevelopment and densification, and requires taxing the added value created through planning measures. It is undoubtedly premature to judge the concrete impact of this legislative change on municipal planning. However, it seems reasonable to postulate that the unprecedented public debate that took place within the context of this revision encouraged local authorities to adapt some greenfield planning practices into compact urban development, even within small municipalities.

It is encouraging that medium-sized and small municipalities have also started introducing more land-management and quality-oriented policies in recent years. This shows that local planning practices may evolve towards further reinforcing growth-management approaches in the future.

3.6.3. Large municipalities have greater planning capacity and use more growth-management policies

Our analysis confirms results from the USA (e.g., McDonald & McMillen, 2004) indicating that population size plays a crucial role in managing urban development. Specifically, larger municipalities have greater planning capacity and use more growth-management policies than their smaller counterparts. In addition, our findings regarding planning capacity are in line with the work of Steiner and Kaiser (2013), who observed that general administrative capacity increased in Swiss municipalities with increasing population size.

Smaller municipalities may be limited in pursuing growth management because they often have restricted financial and administrative capacity. Furthermore, they compete with other municipalities to attract good taxpayers with low-density settlements (Hersperger & Bürgi, 2007) and may only be marginally concerned

about their spatial development because of their rural location. In contrast, large centres usually use reinforcing growth-management policies because they aim to retain economic activities within their boundaries and protect their open landscapes (Nuissl & Couch 2007). Moreover, they are in a better position to negotiate with land developers and private landowners, and have well-qualified staff that researchers find necessary for the successful adoption of policies with regard to sustainable development (Brody, Kang, & Bernhardt, 2010; Göçmen & LaGro Jr, 2015; Hawkins, 2014; Jepson, 2004). In conclusion, diverse factors may influence the number of growth-management policies used by municipalities. However, low numbers are not necessarily indicative of a negative attitude towards compact urban development and a smart mix of reinforcing policies may be more effective at managing urban growth than a large number of such policies.

A few limitations of this study warrant discussion. First, our results are based on self-declaration by local spatial planning officers. Data on early introduction periods in particular may be less reliable due to memory limitations. Second, our study concentrated on the introduction of policies but did not assess whether they are implemented consistently and have a significant impact at the local scale. In the planning literature, recent efforts have concentrated on plan evaluation (Lyles & Stevens, 2014) and on the influence of single growth-management policies on urban growth (e.g., Kline, Thiers, Ozawa, Yeakley, & Gordon, 2014; Siedentop, Fina, & Krehl, 2016). In contrast, relatively few studies have assessed whether distinct growth-management approaches have a long-term influence on urban development. Research and practice would especially benefit from better insight into the interplay between growth-management approaches and implementation mechanisms across types and sizes of municipalities.

Our conclusions are more likely to hold for other federalist countries characterized by a high level of municipal autonomy, a broad range of municipal contexts and a strong recognition of the importance of private property rights. Such countries may include, for example, Germany and Austria, which were classified in the Germanic family of nations, along with Switzerland, by Newman and Thornley (1996). Our findings may not apply, however, to countries with a more centralistic planning tradition, such as Great Britain and France, or to former socialist countries that have experienced strong changes in their property rights regimes in recent decades.

3.7. Outlook and policy implications

This paper suggests that local planning practices are evolving in response to the changes affecting the planning context. In Switzerland, this shift is characterized by limiting greenfield development and promoting infill redevelopment and urban densification. The necessity to promote more compact urban forms is likely to prevail in the next decades. It is therefore crucial to support municipalities that have less planning capacity in their policy choices and provide them with help during the implementation of growth-management policies. Knowledgeable and committed local planning authorities are a prerequisite for the introduction of diversified growth-management approaches capable of effectively steering urban development. Such capacity building could be achieved through the promotion of intercommunal cooperation or municipal mergers, and through the establishment of counselling organizations. It is only with context-specific, well-implemented and reinforcing growth-management policies that it will be possible to effectively achieve sustainable urban development.

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3.9. Supplementary material 3.A: Definitions of the 18 growth-management policies

1) *Spatial planning guidelines* describe the development objectives of the municipality regarding spatial planning. They specify how these objectives should be reached, who is in charge of implementing the appropriate measures and within what timeframe. Spatial development guidelines are not binding and not enforceable in legal terms.

2) The *municipal comprehensive plan* consists of a document—composed of a map and a written text—that covers the whole municipal territory and describes how the municipality plans to attain and coordinate its spatial development objectives. The comprehensive plan specifies where and when activities that have a spatial impact should be carried out on municipal territory. The municipal comprehensive plan is binding on municipal authorities but not on private landowners.

3) *Masterplans* are coordination and management instruments dedicated to the realization of concrete projects (e.g., redevelopment of former industrial areas). They integrate different policy aspects (e.g., social, economic and environmental issues) and various stakeholders in the planning process to foster communication and cooperation. Masterplans are not binding and not enforceable in legal terms, but their guiding principles can be included in municipal comprehensive plans or special district plans.

4) *Rezoning into non-building zone* involves redesignating specific building plots as non-building zones. Upon the decision of the planning authorities, this instrument is implemented within the land use plan and bans land development. It applies only to land plots already designated as building zones.

5) The designation of *conservation zones to limit urban extension* (e.g., nature conservation zones) pursues the explicit goal of limiting the extension of urban areas by preventing further land development. Upon the decision of the planning authorities, this instrument is implemented in the land use plan and bans land development. It applies to land plots not designated as building zones.

6) *Specification of minimum utilization densities*—measured by the floor-area ratio—applies to all building plots within a specific class of building zone. Upon the decision of the planning authorities, this instrument is implemented in the building ordinance and obliges developers to build at higher densities.

7) *Increase in maximum utilization densities*—measured by the floor-area ratio—applies to all building plots within a specific class of building zone. Upon the decision of the planning authorities, this instrument is implemented in the building ordinance and allows developers to build at higher densities.

8) *Upzoning* is defined as rezoning selected building plots from a given building zone into a building zone allowing higher utilization densities. It is applied on a case-by-case basis. Upon the decision of the planning authorities, this instrument is implemented in the land use plan and allows developers to build at higher densities.

9) *Phased development requirements* define the sequence in which building plots must be connected to public facilities (e.g., electrical, water, sewer and road systems) and new buildings must be built within special districts. This instrument can only be applied upon the agreement of both planning authorities and land developers. It is implemented in a special district plan and encourages developers to use building land rationally.

10) *Density bonuses* allow for increases in maximum utilization densities—measured by the floor-area ratio—for specific districts, in exchange for compliance with additional planning requirements (e.g., stricter architectural requirements, or the provision of affordable housing units). This instrument can only be applied if planning authorities and land developers both agree. It is implemented in a special district plan and allows developers to build at higher densities than those stated in the land use plan.

11) *Density bonuses conditional on good access to public transport* increase the maximum utilization densities—measured by the floor-area ratio—for building plots that are well connected to public transport. Upon the decision of the planning authorities, this instrument is implemented in the building ordinance or a special district plan and allows developers to build at higher densities.

12) *Land readjustment* is a procedure that implies the reorganisation of land to make building land economically suitable for construction and development. It includes a new allocation of property rights within a defined perimeter for land consisting of scattered and irregular plots. This instrument can be implemented in various forms and requires different implementation approaches depending on the canton. It encourages developers to use building land rationally.

13) *Measures against land hoarding* aim to prevent building plots that are designated as building zones from being left unused and unbuilt. This instrument can be implemented in various forms and requires different implementation approaches depending on the canton (e.g., obligation to build associated with a municipal pre-emption right, designation as a building zone only if the land plot is rapidly developed, contracts between the landowner and the municipality). It encourages developers to use building land rationally.

14) *Taxing added value* that is created through planning measures aims to redistribute the benefits created through spatial planning measures (e.g., increases in the real estate value of a land plot through its designation as a building zone) to the public community. This taxing can consist of a direct contribution through taxing mechanisms, or an indirect contribution (e.g., contract involving a contribution to the financing of public infrastructure), depending on the canton. It encourages developers to use building land rationally.

15) *Public acquisition of land* refers to when the municipality purchases private land in order to better steer spatial development towards the desired planning outcome. This instrument can only be applied if planning authorities and land owners agree. It aims to use building land rationally.

16) *Inventories of urban densification potential* systematically identify all areas that could be densified within the existing urban area and evaluate the needs that could be met in these areas in the foreseeable future. Areas with densification potential consist of brownfield areas, gaps between existing buildings, unbuilt building zones and existing buildings whose utilization density could be increased (i.e., by conversion, extension or addition of storeys).

17) *Programmes for the redevelopment of existing urban areas* aim to improve the quality of the urban environment in existing urban areas (e.g., by creating new urban parks, redeveloping high-density residential districts or renovating urban core areas). This instrument can only be applied if planning authorities and land developers/owners agree.

18) *Programmes for the qualitative enhancement of new development projects* aim to promote the qualitative enhancement of urban design and architecture in new construction projects in high-density districts. Such programmes can be implemented through diverse instruments, such as architectural competitions and design reviews. This instrument can only be applied if planning authorities and land developers/owners agree.

3.10. Supplementary material 3.B: Preliminary analyses

To assess whether municipality type (i.e., centre, suburban, rural) had a significant impact on the number of policies in place in 2014, we performed a Kruskal-Wallis test between all initial municipality categories (i.e., very large centres, large centres, medium-sized centres, small centres, medium-sized suburban, small suburban, medium-sized rural, small rural). The Kruskal-Wallis test showed that the median number of policies in place was significantly different between categories of municipalities ($\chi^2(7) = 143.25$, $p < 2.2e^{-16}$). Subsequently, pairwise comparisons were performed using Dunn's (1964) procedure with a Bonferroni correction for multiple comparisons. This analysis showed no statistical difference between medium-sized municipality types (medium-sized centres / medium-sized-suburban: p = 1; medium-sized centres / medium-sized rural: p = 1; medium-sized suburban / medium-sized rural: p = 1) or between small municipalities types (small centres / small suburban: p = 1; small centres / small rural: p = 1; small suburban / small rural: p = 1). To validate these results, we fixed a negative binomial model to test the influence of (a) population size and (b) type of municipality on the number of policies in place. We chose this method since the response variable (number of policies in place in 2014) was a count data variable showing over-dispersion without excess zeros. The model (logLik = -3106, AIC = 3116.6, theta = 7.9) confirmed that population size had a significant influence on the number of policies in place (p < 2.2e-16), but that the type of municipality (i.e., centres, suburban, rural) had no significant impact.

CHAPTER 4:
IMPACT OF PLANNING MANDATES ON LOCAL PLANS: A MULTI-METHOD ASSESSMENT (PAPER II)

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Submitted to *European Planning Studies* in December 2016

Abstract: An increasing number of subnational government bodies mandate municipalities to establish a vision for their future development with a local plan. Outside the United States, few studies have assessed whether these mandates succeed at increasing formal quality, policy focus and implementation of local plans. In addition, the reasons that prompt governments to impose mandates remain unclear. To tackle these issues, we used a multi-method approach combining interviews, plan content analysis and questionnaires to compare mandated and voluntary planning in Switzerland. Our analysis reveals that mandates only have limited impact on local plans. In particular, they do not produce higher quality plans than voluntary planning and do not improve implementation of policies. To increase the quality of local plans, we suggest that planning mandates contain more provisions regarding the formal structure and the content of the plans. It is also proposed that planning mandates be paired with financial incentives and technical assistance to increase local commitment and capacity. However, such accompanying measures are costly and would consume considerable resources from planning agencies. Future studies should examine how to find a compromise between mandated and voluntary planning to focus subnational and local capacity towards delivering well-crafted local plans at key locations.

Keywords: planning evaluation; policy focus; plan quality; comprehensive plan; intergovernmental coordination

4.1. Introduction

The role of plans in the planning cycle has been a topic of continuous debate over the past decades (Alexander, 2011; Baer, 1997; Elinbaum & Galland, 2016). Questions have been raised concerning whether plans are indeed needed (Neuman, 1998), and whether they should be mandatory and, if so, how they should be conceived and evaluated (Hoch, 2007; Laurian et al., 2010; Talen, 1996). The answers to these questions are far from straightforward, and have always been framed with respect to the particular context of the planning process, divergent planning traditions under consideration within those contexts and the levels of governance. Nevertheless, no matter the scope and context, plans have remained one of the main tools to guide future growth and development of communities (Guyadeen & Seasons, 2016).

At the local level, municipalities are increasingly expected to adopt proactive planning approaches beyond zoning and to be actors in their own development (Gerber, 2016; Normann & Vasström, 2012). To support these efforts, many national and subnational governments have adopted legislation that requires or encourages local communities to develop local plans (Bunnell & Jepson Jr, 2011; Gilgen, 2012). Local plans are first and foremost a vision to steer the long-term development of municipalities. They include goals, policies, and strategies to guide local decisions towards achieving the desired spatial development, are developed in a participatory process involving local stakeholders, must be accepted by the community and be adopted by its elected officials. (Randolph, 2004). They may be sectorial—focusing on selected themes such as transportation or energy—or comprehensive—in which case they strive to coordinate a wide range of goals (Gilgen, 2012). The latter are known in the international literature as "municipal comprehensive plans", "general plans", "master plans" (US, China), or "official community plans" (Canada) (Norton, 2008; Randolph, 2004; Stevens, 2013).

The impact of planning mandates on local plans is contested among scholars. Empirical studies about natural hazard mitigation and planning for affordable housing have demonstrated that mandates overcome local political opposition to planning and thereby encourage municipalities to plan for issues they would not tackle without mandates (Berke, Roenigk, Kaiser, & Burby, 1996; Hoch, 2007). A research project carried out in five US states at the beginning of the 1990s clearly showed that state mandates increase the quality of local plans for natural hazard mitigation (Burby et al., 1993; Dalton & Burby, 1994). Conroy and Berke (2004) further explored the topic by analysing 42 plans across the United States, and showed that mandates can improve the quality of sustainable development policy focus. In addition, it is argued that planning processes leading to the development of local plans can trigger local discussion and support the creation of a common vision for future development among stakeholders (Gilgen, 2012). However, empirical studies have also shown that mandates might lower local enthusiasm for planning and yield plans that only comply to minimal legal requirements (Berke, Cooper, Aminto, Grabich, & Horney, 2014; Hoch, 2007). A study by Bunnell and Jepson (2011) on the communicative and persuasive qualities of plans in four US states even found that planning mandates can have a negative impact on their creativity and originality. In line with these mixed opinions, the reasons that prompt governments to impose planning mandates remain unclear.

The study designs employed by previous research may have often been too narrow to uncover why some governments impose mandates while others do not. Most previous investigations have relied on plan content

analysis (Berke, et al., 2014; Berke, et al., 1996; Bunnell & Jepson Jr, 2011) or a combination of plan content analysis and phone interviews with local officials (Conroy & Berke, 2004; Hoch, 2007) to study planning mandates and their impact on local plans. With the exception of the studies by Burby et al. (1993) and Dalton and Burby (1994), there have been few attempts to adopt more integrative research approaches. Multi-method study designs can provide valuable insights because they can combine quantitative and qualitative methods and integrate expert assessment with planners' knowledge. In addition, the integration of different analytical techniques makes it possible to compensate for the limitations of single methods and conveys a more comprehensive picture than either would alone (Morse, 2003). For example, interviews with officials can help uncover the reasons that drive the enactment of mandates, while plan content analysis and questionnaires can provide quantitative results regarding the impact of mandates on plan quality and policy implementation.

There is a high level of agreement with respect to how to measure the quality of plans (Lyles & Stevens, 2014). Regarding plan quality evaluation, Norton (2008) emphasizes that one should distinguish between plans' policy focus and their formal quality. Policy focus relates to their policy message, and previous research efforts have examined the ability of plans to foster sustainable development (Berke & Conroy, 2000; Conroy & Berke, 2004) and smart growth (Edwards & Haines, 2007), or manage urban growth and sprawl (Brody, Carrasco, & Highfield, 2006; Norton, 2005b, 2008). Formal quality refers to how the policy message is conveyed, documented and justified. A recent plan quality evaluation by Stevens (2013) has, based on previous work from Berke and colleagues (Berke, Godschalk, & Kaiser, 2006), identified the following eight dimensions of plan formal quality. The *fact base* provides a description of the municipality's actual conditions, while *goals* describe how the municipality plans to develop in future. *Implementation* and *monitoring* contain provisions regarding to how the plan's policies should be implemented—and respectively evaluated—to reach the municipality's goals. The *interorganizational coordination* entails provisions related to how policies should be coordinated with other plans or organizations. Finally, *participation* describes the public participation process set up during the plan's development, while *organization and presentation* evaluates the plan's user-friendliness. Based on these dimensions, Stevens, Lyles and Berke (2014) have suggested standardized criteria for plan quality evaluation, which form the starting point for our assessment.

Despite considerable research on plan evaluation (Guyadeen & Seasons, 2016), most efforts to evaluate the quality of local plans and the impact of planning mandates have focused on the United States. In their meta-analysis of more than 40 plan quality studies, Lyles and colleagues (2014) listed only eight such studies conducted outside the United States, i.e., in New-Zealand, Canada, Australia, the United Kingdom and the Netherlands. In Europe, research has focused rather on the evaluation of cantonal comprehensive plans (Mueller & Hersperger, 2015) or strategic spatial plans (Abis & Garau, 2016), and more generally on conceptual issues of planning evaluation (De Montis, 2016; Faludi, 2000; Oliveira & Pinho, 2009; Soria & Valenzuela, 2013).

Even less effort has been put into investigating whether mandates have an impact on policy implementation, even in the United States. For example, while Burby et al. (1993) compared hazard mitigation plans in US states with and without mandates and demonstrated that a high proportion of policies were implemented, they did not pursue their analysis to assess whether implementation was higher in states with mandates than without. In general, the relationship between planning mandates, plan quality, and policy implementation remains under-

researched.

To contribute to our understanding of the impact of planning mandates on local plans, the present study focuses on Switzerland—a federalist country where several cantonal governments (analogous to state-level in the US) mandate or enable local plans—and compares mandated and voluntary planning. We consider that a federalist country is good ground for studying the impact of planning mandates as it facilitates the comparison of local planning under different cantonal legislations. We apply a multi-method approach, combining interviews with planning officers at the cantonal-level, content analysis of planning documents, and questionnaires addressed to local officials, to study the impact of mandates on Swiss local plans. Specifically we address: (1) why some cantons mandate local plans while others rely on voluntary planning and only enable them, and how cantonal officials assess benefits and drawbacks of such mandates; and (2) the impact of cantonal mandates on the policy focus and the formal quality of local plans, and on the implementation of their policies. The policy focus of interest is sustainable spatial development, with an emphasis on compact urban development, landscape preservation and encouragement of low-impact mobility.

The sections of the present paper are organized as follows. Section two briefly introduces the specificities of the Swiss planning system. Section three describes the study area and details the study design and methods, while section four presents the results. Finally, section five discusses the main findings and suggests recommendations for science and practice, while section six summarizes the main conclusions.

4.2. Spatial planning in Switzerland

Switzerland is a federalist country organized into 26 cantons spanning over four linguistic regions (i.e., German, French, Italian, and Romansh). The Swiss planning system shares common characteristics with other federalist countries, such as Germany or Austria, whereby planning unfolds both top-down and bottom-up. In this manner, federal, cantonal, and local governments have distinct responsibilities but are jointly responsible for spatial planning (Newman & Thornley, 1996). Consensus building is therefore at the core of Swiss planning, unlike in the US planning system, which is characterized by a less structured planning framework and greater criticism towards state intervention (Schmidt & Buehler, 2007). In Switzerland, cantons have considerable autonomy and make provisions regarding land-use planning which is usually delegated to local governments (VLP-ASPAN, 2012). All municipalities are required to develop a Land Use Plan (*Nutzungsplan*) binding to landowners, but cantonal authorities have full authority to decide whether they require municipalities to develop a local plan (*Richtplan*), whether they rely on voluntary planning and only enable local plans, or whether they do not regulate this issue at all. In this regard, Swiss legislation reflects the US situation, where about half of the states do not mandate local plans, but only enable local governments to develop them (Pendall, 2001).

4.3. Research design and methods

4.3.1. Study area

To ensure consistency of terminology, we restricted the study to the German-speaking cantons of Switzerland. We further excluded cantons that do not explicitly require or enable the development of local plans, promote other instruments to steer local planning, or were not willing to cooperate in the study. As a result, we selected 11 cantons whose legislation either mandates (Glarus, Nidwalden, St.Gallen, Thurgau, Zug, and Zürich) or enables (Bern, Basel-Landschaft, Basel-Stadt, Schwyz, and Aargau) the development of local plans (Fig. 4.1., in grey). This area covers 14,771 km^2, entails 1,046 municipalities and has a population of 4,634,144 inhabitants (57% of total Swiss population – BFS, 2014). The geographical and socio-economic characteristics of the selected cantons vary from small and densely populated urban cantons (e.g., Basel-Stadt with three municipalities and a population density of 5,080 inhabitants/km^2 over 37 km^2), to large cantons spreading over rural and mountainous regions (e.g., Bern, with 362 municipalities and a population density of 170 inhabitants/km^2 over 5,960 km^2).

The distribution of local plans in the study area was assessed in a Swiss nationwide survey of local planning instruments conducted in 2014 by Kaiser et al. (2016). This study clearly showed that cantonal mandates have an influence on which proportion of municipalities develop a local plan. In cantons with planning mandates, the proportion of municipalities that had a local plan in place varied from 75% (Zürich) to 100% (Glarus and Zug). In contrast, this proportion ranged from 15% (Basel-Landschaft) to 60% (Schwyz) for cantons without a mandate, which the exception of Basel-Stadt were all three municipalities have developed a local plan, even though they are not required to. The survey further indicated that municipalities with a high number of inhabitants developed local plans more often than their smaller counterparts, and that the use of local plans has constantly increased since the 1970s. In the study area, most mandates were imposed shortly after the introduction of the Federal Law on Spatial Planning at the beginning of the 1980s. The last planning mandate (i.e., Glarus) was enacted in 2010.

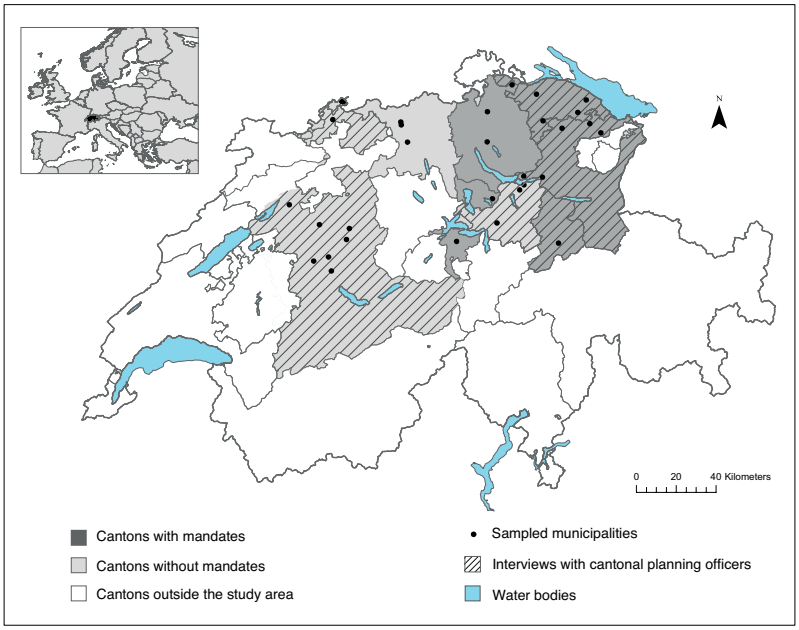

Figure 4.1. Study area, and identification of cantons with and without mandates for local plans. Cantons without mandates rely on voluntary planning and enable local plans instead of requiring them.

4.3.2. Multi-method study design

To study the impact of cantonal mandates on local plans, we used a combination of interviews, plan content analysis, and questionnaires. Each approach aimed to tackle specific sub-questions and was conducted with a particular sampling strategy (Fig. 4.2.). The different methods were used sequentially and final results were triangulated to obtain a comprehensive understanding of the impact of mandates and the reasons behind their enforcement.

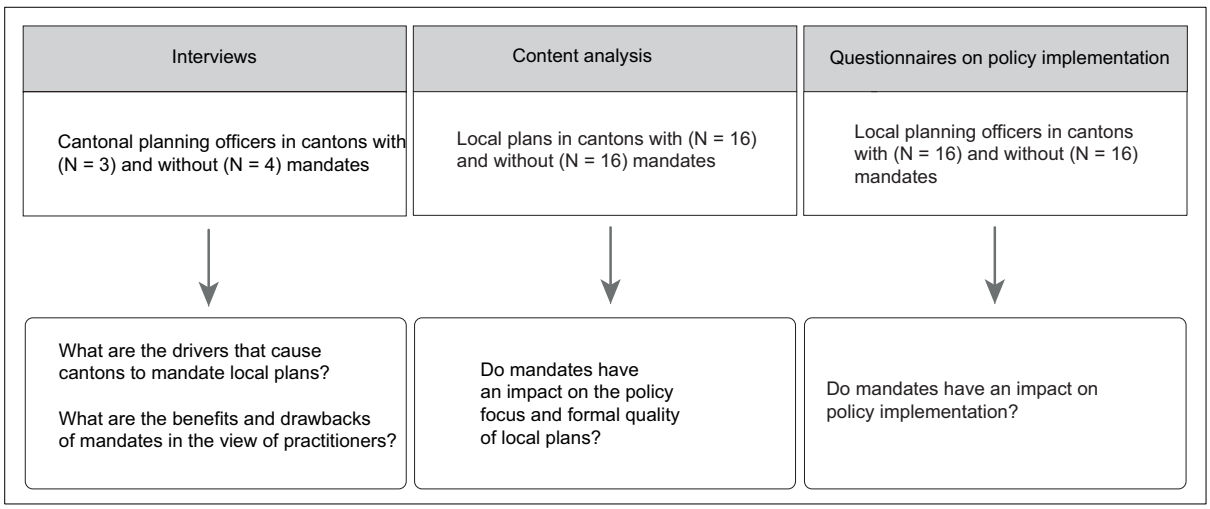

Figure 4.2. Description of the multi-method approach, the specific sampling strategies and the research questions.

4.3.3. Interviews with cantonal planning officers

We conducted semi-structured interviews with cantonal planning officers to explore why some cantons mandate local plans while others rely on voluntary planning and only enable them. We compared and contrasted the answers of planning officers from three cantons that mandate local plans (Thurgau, St-Gallen, Glarus) with those from four cantons that only enable them (Bern, Basel-Landschaft, Schwyz, Basel-Stadt). First, planning officers were asked why their canton requires/does not require the development of local plans. Subsequently, they were asked to assess six statements regarding potential benefits and drawbacks of planning mandates that are either commonly found in the international literature, or we deemed as especially relevant to the Swiss context. Potential benefits relate to: (1) overcoming local opposition to planning (Berke, et al., 1996; Hoch, 2007), (2) encouraging the development of high quality plans (Burby, et al., 1993; Conroy & Berke, 2004; Dalton & Burby, 1994), (3) triggering local discussion and long-term decision-making (Gilgen, 2012). Conversely, potential drawbacks relate to: (1) lowering local enthusiasm for planning (Berke, et al., 2014; Hoch, 2007), imposing a high burden on municipalities (own suggestion given the high number of Swiss municipalities that are very small and have limited financial and planning capacity), and (3) lowering plan creativity and originality (Bunnell & Jepson Jr, 2011).

4.3.4. Content analysis of local plans

To select local plans from a broad range of municipalities, we applied stratified random sampling (Gregoire & Valentine, 2008). Two criteria, 1) presence or absence of a cantonal mandate, and 2) municipal population size (< 1,000 inhabitants; 1,000 – 4,999; 5,000 – 9,999; ≥ 10,000), yielded eight sampling strata. In each sampling stratum, we randomly selected four municipalities and requested their plans. Most plans were adopted after the year 2000, but some dated from the 1980s or 1990s (Supplementary material 4.A).

Based on a federal report (ARE, 2009) and previous work by Norton (2008), we defined 16 evaluation protocol items in three categories (compact urban development, landscape preservation, and encouragement of low-impact mobility) to describe the focus areas of sustainable spatial development (Supplementary material 4.B). For the analysis of formal quality, we used Stevens's protocol (2013), with additions or adaptations (see Supplementary material C, column "Source" for more details) in order to better match the Swiss planning context and clearly distinguish between policy focus and formal quality. Our resulting protocol entailed seven dimensions of formal quality measured in 36 items (Supplementary material 4.C).

Prior to the actual analysis, two coders were trained and a draft protocol was tested on five local plans not included in the present study and subsequently refined. Each protocol item was coded either with a 1, meaning that the item was present, or a 0, indicating the item was not present. The two coders independently analysed the plans. We subsequently determined the coding reliability by calculating Krippendorff's alpha (Krippendorff, 2013) and following the procedure recommended by Stevens, Lyles and Berke (2014) to decide which items were sufficiently reliable to be included in the final analysis. Specifically, plan quality dimensions were classified depending on (1) the number of items included in each dimension, and (2) the degree to which the items were distributed throughout the plans. Lower and upper standards of alpha scores were then defined

(Supplementary material 4.D). For items with alpha scores above upper standards, differences among coders were reconciled and the items were included in subsequent analyses. For items with alpha scores between upper and lower standards, differences among coders were reconciled based on a reassessment of the protocol. Items with alpha scores below lower standards were dropped from subsequent analyses unless they were deemed crucial for the study. In this case, differences among coders were reconciled based on a reassessment of the protocol.

We used a standardization process to enable the comparison between the dimensions of policy focus and formal quality. For each plan and dimension, we totalled the number of items present, divided the sum by the number of items in the dimension and multiplied the number by 100 to obtain index scores ranging from 0 to 100.

Two sample t-tests were then performed to assess the impact of cantonal planning mandates on policy focus and formal quality (Albert & Rizzo, 2012), by comparing scores between mandating and non-mandating cantons (i.e., cantons relying on voluntary planning and thus only enabling local plans). Since variables were non-normally distributed, we performed a sensitivity analysis by using a Mann-Whitney U test that yielded the same conclusions as the t-tests (Conover, 1999).

4.3.5. Questionnaires on policy implementation

To study whether policies were implemented more effectively in cantons that mandate local plans than in cantons that only enable them, we sent a questionnaire to the main planning officers of the 32 municipalities, addressing two aspects of implementation. Planning officers were asked to estimate the proportion of policies they expected to be implemented before the end of their plan's lifespan (i.e., on a scale from 0 to 100%), and how often the progress of implementation was assessed (i.e., never, seldom, occasionally or continuously). In total, 29 questionnaires were returned, for a response rate of 91%. We used Fisher's exact tests to measure the impact of mandates on these two parameters, because the contingency tables contained cells with low expected frequencies (Agresti, 2013). The tests were performed with the function *fisher.test* in the R *stats* package (R Core Team, 2016), which makes it possible to adapt the algorithm to large contingency tables, based on the work of Mehta and Patel (1986) and Clarkson, Fan & Joe (1993).

4.4. Results

4.4.1. Reasons for mandating local plans

Interviews with cantonal planning officers revealed that cantons have distinct reasons for passing legislation mandating or only enabling local plans. Among cantons with planning mandates, planning officers from Thurgau and St. Gallen highlighted the goal of promoting local long-term strategic planning, since municipal governments are more aware of the specificities of and challenges faced by their communities than regional or cantonal planning authorities (in some cantons, municipalities are grouped into planning regions that are required to develop a regional plan). Furthermore, they stressed that local plans were beneficial to all municipalities, even those with low rates of urban growth, since they encourage local actors to include diverse

issues (e.g., landscape protection, nearby recreation, public finances) when reflecting on future development. In the third canton that mandates local plans (Glarus), the mandate was actively promoted by the main planning officer on the occasion of a large municipal merger in 2010, when 25 municipalities were merged into three large municipalities. In this case, the mandate was expected to empower the newly formed municipalities to develop a culture of long-term strategic planning over geographically and economically heterogeneous areas.

In the four cantons that only enable local plans, most planning officers did not precisely know why cantonal authorities had not mandated local plans. In any case, the balance of power between local and cantonal governance levels appears to have played an important role. This was explicitly confirmed for Schwyz, where the planning officer declared that cantonal authorities were reluctant to reduce the traditionally high level of planning autonomy in the municipalities. He also stated that local plans would not be relevant for the numerous municipalities in his canton that are situated in mountainous regions, have few inhabitants and experience low rates of urban development.

While planning officers provided various reasons justifying why cantonal governments may or may not pass legislation mandating local plans, they generally agreed on the potential benefits and drawbacks of planning mandates. Their opinions regarding the six suggested statements are summarized in Table 4.1. Interestingly, there appears to be no major difference between planning officers from mandating and non-mandating cantons. All agreed that cantonal mandates can overcome local political opposition to planning and can assure that all municipalities engage in a long-term planning process. Many agreed that mandates trigger local discussions and enable the development of a common vision to guide long-term decision-making. In this regard, interviewees often perceived the planning process leading to the development of a local plan as being as valuable as the plan itself since it facilitates the identification and coordination of divergent planning interests. In contrast, in the opinion of planning officials, mandates do not encourage the development of higher quality plans because most mandates do not entail detailed provisions. Rather, planning officers claimed that plans' overall quality mainly depends on local political will, and that open and constructive discussion between cantonal and local authorities is more important than mandates towards ensuring that plans are of high quality.

Regarding the potential drawbacks of planning mandates, planning officers' opinions were more mixed. This was especially true concerning the tendency of mandates to lower local enthusiasm for planning. Most interviewees acknowledged that the obligation to develop a local plan imposes a burden on municipalities. However, planning officers made a distinction between financial and administrative burdens. Overall, they highlighted that, while most local authorities can rely on the expert knowledge of private planning consultants, they often lack financial and in-house planning capacity to precisely tailor the planning process to the needs of their community. Finally, most planning officers clearly denied that mandates lower planning creativity and originality. Instead, they reported that local plans tend to be similar because of municipalities' limited financial capacity, and because of their lack of interest in planning. Consequently, private planning consultants are prompted to use templates and deliver standardized plans.

Table 4.1. Opinions of the seven cantonal planning officers regarding potential benefits and drawbacks of mandates for local plans. The following symbols identify the orientation of planners' opinions: (+) indicates general agreement with the statement, (-) indicates general disagreement with the statement, (+/) indicates partial agreement with the statement, and (•) indicates no particular opinion.

Canton	Mandate	Potential benefits			Potential drawbacks		
		Overcome local political opposition to planning	Encourage the development of high quality plans	Trigger local discussion and long-term decision-making	Lower local enthusiasm for planning	Impose a burden on municipalities	Lower plans' creativity and originality
Thurgau	Yes	+	-	+/-	+/-	+/-	-
St. Gallen	Yes	+	-	+	•	+/-	-
Glarus	Yes	+	-	+	-	+	-
Bern	No	+	+/-	+	+	+/-	-
Schwyz	No	+	-	+	•	+	-
Basel-Stadt	No	+	•	+	-	+/-	-
Basel-Landschaft	No	+	•	+	•	-	+

4.4.2. Impact of mandates on policy focus and formal quality

Overall, robust results were achieved, as evidenced by the large proportion of alpha scores that indicate a high level of agreement among coders. Only item 1.2.4 was dropped from the analysis since it overlapped with item 1.2.1. All other items with low alpha scores were deemed important for subsequent analyses and were reassessed and reconciled.

Mandates were found to improve the policy focus of local plans in regard to some aspects of sustainable urban development (Table 4.2.). Local plans in mandating cantons entailed significantly more provisions related to compact urban development (mean score = 69.6) and landscape preservation (mean score = 68.8) than plans in non-mandating cantons (mean score of 39.2 for compact urban development and 37.5 for landscape preservation). However, mandates had no significant impact on the content of local plans regarding low-impact mobility. Overall, mandates were found to encourage the development of local plans that are comprehensive and tackle all three aspects of a sustainable urban development. Local plans reached a score of approximately 70 on all three indicators in cantons with mandates compared to those without, which only scored relatively high on low-impact mobility (65.6). These results suggest that municipalities tend to focus on selected topics and fail to coordinate a wide range of goals if they are not required to do so. Results also reveal that Swiss municipalities pay particular attention to low-impact mobility.

Table 4.2. Policy focus scores of local plans in cantons with and without mandates.

	Mean scores		Test statistic	
Policy focus	Mandate	No mandate	t	p-value
Compact urban development	69.6	39.2	-3.02	0.005*
Landscape preservation	68.8	37.5	-2.60	0.014*
Low-impact mobility	70.3	65.6	-0.47	0.640
Overall score	**69.6**	**45.9**	**-2.56**	**0.016***

*statistically significant

Mandates did not show any significant impact on the formal quality of local plans (Table 4.3). Whether mandates were in place or not, local plans scored highest on the dimension *interorganizational coordination*, with average scores on the dimensions *goals* and *implementation*, and low scores on the dimensions *fact base*, *monitoring and evaluation*, *public participation*, and *organization and participation*. These results indicate that municipalities acknowledge that they must coordinate their actions with other municipal, regional and cantonal activities to realize the goals stated in their local plans. However, development goals are less precisely detailed, and local plans often lack clear provisions regarding the practical implementation of policies. In addition, municipalities' geographical, socio-economic and land-use conditions are generally insufficiently described. The same applies to the description of the public participation process that led to the plan's development. Finally, most local plans are not presented and organized so as to be easily accessible to a broad audience, and they generally lack any indications regarding the plan's long-term monitoring and evaluation.

Table 4.3. Formal quality scores of local plans in cantons with and without mandates.

	Mean scores		Test statistic	
Formal quality	Mandate	No mandate	t	p-value
Fact base	42.0	35.2	-0.67	0.50
Goals	53.1	66.7	1.16	0.26
Implementation	54.2	50.0	-0.46	0.65
Monitoring	25.0	35.6	0.97	0.34
Interorganizational coordination	90.6	82.2	-1.13	0.27
Participation	48.8	38.7	-0.87	0.39
Organization and presentation	40.2	49.5	1.29	0.20
Overall score	**51.9**	**50.6**	**-0.20**	**0.84**

4.4.3. Impact of mandates on policy implementation

Mandates did not have a significant impact on the proportion of policies likely to be implemented (Fig. 4.3. A), or on the assessment of their implementation progress (Fig. 4.3. B), as confirmed by Fisher's exact tests ($p = 0.98$ for policies' implementation, and $p \approx 1$ for the assessment of implementation progress). Regardless of whether mandates exist, most local planning officers (ca. 35%) expected that about half of their plan's policies (41 - 60%) would be implemented before the end of the plan's lifespan. Policy implementation progress was assessed occasionally (ca. 35%) or seldom (ca. 30%). Continuous assessment took place in municipalities with and without mandates (ca. 25%).

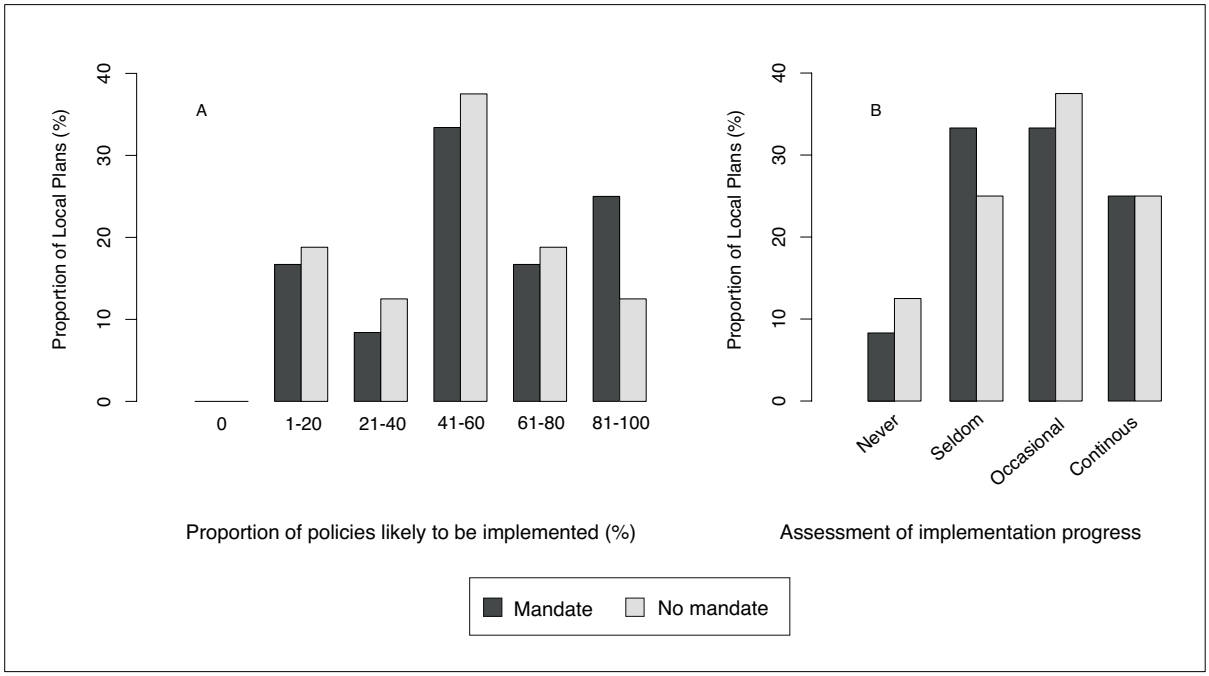

Figure 4.3. (A) Proportion of policies likely to be implemented and (B) frequency of assessing implementation progress in cantons with and without mandates.

4.5. Discussion

4.5.1. Impact of mandates on local plans and on policy implementation

Overall, mandates had a limited impact on local plans and on the implementation of their policies in the study area. In particular, plans developed under cantonal mandates did not exhibit higher formal quality than those developed voluntarily. In both cases, local plans were rarely written and designed so as to be user-friendly and accessible to a broad audience. The main geographical, natural and socio-economic features of the municipalities in question were often insufficiently described which, in turn, did not adequately foster and communicate a strong sense of place. Furthermore, development goals were reported in very technical terms. Consequently, most plans lacked a unifying storyline to inspire and encourage local action. Inspirational and imaginative plans are however key elements to facilitate the bridging of divergent attitudes and beliefs, and to strengthen local commitment towards common goals (e.g., Berke, et al., 2006; Bunnell & Jepson Jr, 2011). In addition, the examined local plans often lacked clear implementation and monitoring provisions, irrespective of whether they were mandated or not. For example, many plans did not specify which organizations were responsible for policy implementation, did not entail cost estimations and did not contain any indications regarding plan monitoring. These omissions are especially troubling because "implementation and monitoring measures are critical for ensuring that plan policies are actually applied to municipal decisions in the intended manner in order to achieve plan goals […]" (Stevens, 2013, p. 483).

Our observations are in line with other recent findings. For example, Lyles and colleagues (2014) reported that mandates had only a very limited impact on the quality of hazard mitigation plans in the United States, and Bunnell and Jepson (2011) determined that mandates may even decrease the persuasiveness and communicative

quality of plans. Many earlier studies, however, report the contrasting conclusions. For instance, Berke and French (Berke & French, 1994) and Burby et al. (Burby, et al., 1993) found that mandated plans addressed hazard mitigation better. These contradictions may result in part from the characteristics of the planning mandates under study. Berke and French (1994) and Burby et al. (1993) studied mandates with precise requirements and strong enforcement mechanisms. In contrast, in our sample most cantonal mandates lack detailed provisions regarding the content of local plans such that municipalities lacked necessary guidance and incentives to develop high quality plans.

The lack of strong enforcement requirements may also explain why municipalities in mandating cantons did not implement policies more consistently or assess their implementation progress more often than municipalities in non-mandating cantons. Plan implementation success is, however, not limited to measuring the proportion of implemented policies, but also implies assessing whether plans guide local decisions (Lyles, Berke, & Smith, 2016). This aspect was not tackled in the present study but should be addressed in future research to broaden our understanding of the impact of government mandates on policy implementation.

Finally, the impact of mandates on the policy focus of local plans proved to be quite complex. Plans developed under a mandate entailed more policies to foster compact urban development and landscape preservation than in plans developed voluntarily. In non-mandating cantons, municipalities tended to restrict the scope of their plans to specific topics, in particular to the promotion of low-impact mobility. Political commitment to this issue may be high because traffic-reducing measures and actions to promote human-powered mobility have a clear and direct impact on the daily life of local communities. Furthermore, they are relatively straightforward to implement and can often be realized during the term of elected officials. The fact that compact urban development and landscape preservation were better addressed in mandating cantons reveals that mandates strengthen policy focus for sustainable spatial development, and support similar conclusions drawn in the context of sustainable development (Conroy & Berke, 2004) and hazard mitigation (Burby & May, 1997). However, these conclusions need to be put into perspective in light of the variety of cantonal legislation in the study area. In three of the non-mandating cantons (i.e., Basel-Landschaft, Basel-Stadt and Schwyz), municipalities are obliged to tackle all aspects of sustainable spatial development if they choose to develop a plan. Consequently, the policy focus of their local plans was comparable to that indicated by scores observed in mandating cantons. Had we restricted our sample to these cantons, we would likely have found no difference between mandated and voluntary planning. Conversely, municipalities in the two remaining non-mandating cantons (i.e., Bern and Aargau) have the option to develop single-purpose plans. For this reason, many local plans in our sample of non-mandating cantons focused on transportation or landscape protection. This explains, in part, why non-mandating cantons were found to produce plans with a narrower policy focus. In reality, the impact of cantonal mandates is less clear-cut, and the characteristics of the planning legislation play a key role in explaining planning outcomes in non-mandating cantons.

4.5.2. Reasons for adopting cantonal mandates for local plans

Clearly, there is no strict rule to explain why cantons impose planning mandates or rely on voluntary planning. The decision to mandate or only enable local plans depends ultimately on the geographical, economic and political context of the cantons, and on the balance of power between cantonal and local governments.

Three main aspects shaped cantons' decisions to mandate or enable local plans in the study area. Generally, cantonal governments were willing to promote long-term strategic planning at the local scale because many issues—such as landscape protection, traffic mitigation, settlement densification or finance planning—are relevant to most municipalities and are efficiently coordinated in the context of a local plan. However, cantonal governments were reluctant to restrict the high level of planning autonomy traditionally granted to municipalities. Finally, cantonal governments saw less need for a mandate if regional planning structures were already present (Gilgen, 2012). In the canton of Bern, for example, the 362 municipalities are grouped into planning regions that share common geographical and economical characteristics, and each region is required to develop a regional plan. As a result, many planning issues are already coordinated at this regional scale, and municipalities are not required to prepare local plans. In contrast, the cantons of Thurgau and St. Gallen do not rely on strong regional planning structures and favour local plans instead.

Interviews with cantonal officials also revealed that local planning commitment plays a key role in determining the relevance and the success of mandates. For example, the three municipalities of Basel-Stadt all prepared local plans even though they were not required to. They have traditionally benefitted from very limited planning autonomy because of their position within the international agglomeration of Basel (owing to its location near the French and German borders). For this reason, they have been strongly committed to planning once they were granted permission to develop their own local plans. Conversely, canton officials reported that a lack of local planning interest often results in low-quality plans, even when plans are mandated. Norton (2005a) studied this issue in detail in the context of a mandate for coastal resource protection in North Carolina, USA, and showed that the mandate failed to reach its goals because it did not build local commitment. Earlier research efforts have also concluded that governments mandating local plans should build local commitment and planning capacity through funding, technical assistance, guidelines and promotion activities (e.g., Berke & French, 1994; Burby, et al., 1993).

Building local commitment and planning capacity requires significant resources and commitment on the part of government planning agencies. While resources might be sufficient in cantons with a limited number of municipalities, it is not necessarily the case in larger cantons. A comparison between Glarus and St. Gallen—which both mandate local plans—provides a good illustration. The canton of Glarus imposed a mandate for local plans in 2010, and its three municipalities had developed and enforced a plan by mid-2016. The cantonal planning official personally supervised the development of the local plans, attended numerous local planning meetings and supported local authorities throughout the planning process. Instead, the canton of St. Gallen has 77 municipalities and has been mandating local plans for more than 20 years. However, a number of municipalities still had no local plan in place by 2016, and some others had not amended their plans since the 1980s or 1990s. Of course, the differences in these two cantons may be explained, in part, by the fact that many

municipalities in St. Gallen are smaller and have less planning capacity than those in Glarus. However, this may also indicate that mandates are easier to administer if they concentrate cantonal planning capacity towards a restricted number of municipalities.

In light of these observations, we question the pertinence of imposing cantonal-wide mandates without providing planning agencies with appropriate resources to build local commitment and planning capacity. Previous research has already shown that mandates tend to generate weak plans if they are not properly funded and administered (Hoch, 2007), and that voluntary planning may be a viable alternative to planning mandates—as long as municipal governments are offered strong incentives and technical assistance (Pendall, 2001). Our study did not specifically assess the influence of mandate characteristics (e.g., in terms of technical assistance from governmental agency, financial incentives) on local plans. As a result, we cannot assert that mandates with substantial resources for local commitment and capacity building yield better plans than mandates with fewer resources in Switzerland. Nevertheless, the interviews conducted with planning officers give strong indications that this may be the case, especially with reference to the comparison of St. Gallen and Glarus. Future studies could explore this issue empirically to clarify the importance of resource allocation in the context of planning mandates for local plans.

4.5.3. Implications for planning practice

In order to increase the impact of local plans, cantonal governments should set clear goals and precise requirements regarding the content of plans, irrespective of whether they mandate or only enable them. In particular, they should require municipalities to describe their situation and specificities better in order to strengthen a sense of place and foster strong commitment towards community goals. In addition, municipalities should include detailed implementation provisions for each plan and assemble them into an action plan, as illustrated in Stevens (2013). In parallel, cantonal governments could possibly strengthen local commitment and capacity building through educational efforts, increased public participation, financial incentives and technical assistance. As suggested by Lyles, Berke and Smith (2014), cantonal planning authorities could also select cutting-edge local plans to provide examples of best practice.

It should be noted that such accompanying measures are costly and demand increased planning capacity on the part of planning agencies. Depending on the number of municipalities, it might therefore prove difficult and counterproductive to impose canton-wide mandates. Consequently, it may be needed to concentrate efforts on priority areas and restrict the number of municipalities subjected to mandate planning, in order to foster the development of high quality local plans where they are most needed. This implies finding a middle way between mandated and voluntary planning. As an example, the canton of Bern has recently imposed a new single-purpose mandate for energy planning, which is only directed at municipalities that are highly populated or experience rapid urban development.

4.5.4. Methodological aspects and future research

The multi-method approach applied in the present study proved to be especially useful for analysing the impact of government mandates on local plans because it included expert assessment and planning officers' expertise, both at local and cantonal levels. It facilitated fruitful discussion about the pertinence of mandated and voluntary planning, which went beyond the analysis of policy focus, formal quality and implementation. However, as this approach was time-consuming and required polyvalent operators with in-depth knowledge of different analytical techniques, its applicability to further research may be limited. In any case, the protocol and procedure developed by Stevens and colleagues to study local plans in North America (Stevens, 2013; Stevens, et al., 2014) were very useful and were easily applied to the Swiss planning context.

We acknowledge that some methodological aspects warrant discussion to help generalize findings and guide future studies. Even though our results are rather clear, the analysis of additional Swiss local plans may be useful towards confirming and expanding the present findings. In addition, it is possible that plan quality is slightly overestimated in our sample because local officials' willingness to grant us access was influenced by their belief their plans were of good quality. Furthermore, our conclusions may not be limited to planning mandates for sustainable spatial development, but also apply to other policy areas requiring coordination between cantons and municipalities, such as energy efficiency and environmental protection. Further research could tackle this issue. Finally, we recommend that future studies explore the suggested strategy of a middle way between mandated and voluntary planning.

4.6. Conclusion

Planning mandates for local plans are valuable instruments to coordinate planning between cantons and municipalities, but often fail to yield expected policy outcomes. We used a multi-method approach to study and compare the effects of mandated and voluntary planning on Swiss local plans. Results showed limited evidence that mandates increase policy focus, formal quality or the implementation of local plans compared to voluntary planning. To remedy this situation, cantons should provide clearer requirements and more guidance when imposing planning mandates. Where limited cantonal planning capacity is an issue, we suggest adapting mandates to the local context and finding a compromise between mandated and voluntary planning. More research is needed to understand how to carefully allocate resources and to design stipulations to support the development of high quality plans in the most relevant and vulnerable locations.

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4.8. Supplementary material 4.A: Results of the content analysis for the individual plans

					Policy focus				Formal quality							
Municipality	Planning mandate	Canton	Population	Plan adoption	Compact urban development	Landscape preservation	Low-impact mobility	Overall score	Fact base	Goals	Implementation	Monitoring	Inter. coor.	Participation	Organization and presentation	Overall score
M1	Yes	St. Gallen	74581	2012	100	100	100	100	14.3	0	50	66.7	83.3	60	57.1	50
M2	Yes	St. Gallen	26542	2010	100	100	100	100	14.3	50	83.3	33.3	100	0	14.3	41.7
M3	Yes	Zürich	25801	1996	71	75	100	80	14.3	0	16.7	0	100	20	42.9	33.3
M4	Yes	St. Gallen	12698	2010	86	100	75	87	100	100	50	0	100	100	57.1	75
M5	Yes	Glarus	9836	2014	100	100	75	93	71.4	100	50	66.7	100	60	57.1	69.4
M6	Yes	St. Gallen	6144	2010	100	100	75	93	85.7	100	100	33.3	100	100	57.1	83.3
M7	Yes	Zug	5828	2008	71	75	75	73	85.7	50	33.3	66.7	100	80	71.4	72.2
M8	Yes	Thurgau	5086	2011	71	100	75	80	28.6	50	50	33.3	100	40	42.9	50
M9	Yes	St. Gallen	4541	2011	86	75	100	87	57.1	100	66.7	33.3	100	60	28.6	61.1
M10	Yes	St. Gallen	3483	2005	57	25	25	40	42.9	0	33.3	0	50	0	42.9	30.6
M11	Yes	Nidwalden	3110	2011	86	75	100	87	57.1	50	66.7	0	100	40	14.3	50
M12	Yes	Thurgau	1941	1993	43	25	75	47	28.6	50	50	0	83.3	20	28.6	38.9
M13	Yes	Zürich	886	1983	29	25	25	27	14.3	50	33.3	33.3	66.7	80	28.6	41.7
M14	Yes	Zürich	756	2011	57	50	50	53	14.3	50	66.7	0	100	80	57.1	55.6
M15	Yes	Thurgau	621	1994	43	25	25	33	14.3	50	100	33.3	83.3	20	14.3	44.4
M16	Yes	Thurgau	507	1994	14	50	50	33	28.6	50	16.7	0	83.3	20	28.6	33.3
NM1	No	Basel-Stadt	20799	2014	86	75	100	87	14.3	50	33.3	0	100	60	57.1	47.2
NM2	No	Basel-Landschaft	18839	2005	71	75	75	73	14.3	100	50	100	100	40	85.7	63.9
NM3	No	Schwyz	14785	2014	100	100	75	93	71.4	100	83.3	100	100	80	85.7	86.1
NM4	No	Bern	11651	2010	57	100	100	80	42.9	100	75	33.3	100	40	78.6	66.7
NM5	No	Schwyz	8126	2003	57	25	75	53	57.1	100	83.3	33.3	100	80	57.1	72.2
NM6	No	Aargau	7407	2007	14	0	75	27	14.3	050	33.3	33.3	83.3	60	42.9	44.4
NM7	No	Schwyz	6585	2003	43	25	75	47	57.1	100	83.3	33.3	100	80	57.1	72.2
NM8	No	Bern	6084	2008	28.6	50	33.3	83.3	28.6	50	50	33.3	83.3	40	71.4	52.8
NM9	No	Bern	4079	1990	43	0	25	27	14.3	50	16.7	0	50	0	28.6	22.2
NM10	No	Bern	2958	1996	14	50	50	33	42.9	50	50	33.3	83.3	0	28.6	41.7
NM11	No	Aargau	1399	2011	14	0	75	27	71.4	100	66.7	66.7	100	20	42.9	63.9
NM12	No	Basel-Stadt	1150	2004	57	50	75	60	14.3	50	33.3	0	100	60	57.1	47.2
NM13	No	Bern	900	2002	29	0	50	27	14.3	50	16.7	0	50	40	42.9	30.6
NM14	No	Aargau	845	2011	14	0	75	27	71.4	100	66.7	66.7	100	0	42.9	61.1
NM15	No	Bern	635	2012	14	0	0	7	0	0	16.7	0	16.7	20	0	8.3
NM16	No	Bern	471	2003	0	50	25	20	42.9	50	66.7	33.3	66.7	0	42.9	44.4

4.9. Supplementary material 4.B: Protocol to assess the policy focus of local plans

Does the plan include policies to address the following issues?

	Source[a]	Alpha[b]	Decision[c]
1.1. Compact urban development			
1.1.1. Restrict the extension of the urban area	This study	0.69	Reassess
1.1.2. Define the sequence in which building plots must be connected to public facilities and new buildings must be built (phased development requirements)	This study	0.82	Reconcile
1.1.3. Secure high density and high quality of new development areas	This study	1	Reconcile
1.1.4. Densify existing urban areas	This study	0.94	Reconcile
1.1.5. Redevelop and increase the quality of the existing urban fabric	This study	0.77	Reconcile
1.1.6. Encourage the development of mixed-use areas	This study	0.89	Reconcile
1.1.7. Encourage social equity within urban areas	This study	0.65	Reassess
1.2. Landscape preservation			
1.2.1. Protect valuable ecosystems, landscapes, species	This study	0.8	Reconcile
1.2.2. Preserve fertile soils for agricultural uses	This study	0.86	Reconcile
1.2.3. Create nearby recreational areas outside of the urban area, or increase the quality of existing ones	This study	1	Reconcile
1.2.4. Environmental protection	This study	0.54	Drop
1.2.5. Coordinate the transition between urban areas and open landscapes	This study	0.78	Reconcile
	This study		
1.3. Low-impact mobility	This study		
	This study		
1.3.1. Implement traffic reducing measures	This study	0.81	Reconcile
1.3.2. Coordinate urban development with transport development	This study	0.63	Reassess
1.3.3. Promote public transportation	This study	1	Reconcile
1.3.4. Promote human-powered mobility	This study	0.72	Reconcile

[a]Source of protocol items; [b]Value of Krippendorff's alpha; [c]Decision regarding the reliability of protocol items: "reconcile" means that scores from both coders were simply reconciled to be included in the analysis; "reassess" means that the item had to be clarified and the scores reassessed before being reconciled and included in the analysis; "drop" means that the item was dropped from the final analysis.

4.10. Supplementary material 4.C: Protocol to assess the formal quality of local plans

	Source[a]	Alpha[b]	Decision[c]
2.1. Fact base			
2.1.1. Does the plan include a separate section that precisely describes the municipality's general situation (e.g., topography, landscapes, economic development, urban development, public infrastructure)?	This study	0.54	Reconcile
2.1.2. Does the plan include, for the main planning issues, a detailed description of the municipality's general situation in this specific planning realm?	This study	0.49	Reconcile
2.1.3. Does the plan include, for most policies, a short description of the municipality's general situation regarding the specific issue?	This study	0.47	Reconcile
2.1.4. Does the plan include a description of the size of the present population?	Stevens, 2013	0.89	Reconcile
2.1.5. Does the plan include a description of the composition of the present population (e.g., broken down by age or gender) or a description of the present utilization of building zones?	Stevens, 2013	0.79	Reconcile
2.1.6. Does the plan include a description of the size of the future population?	Stevens, 2013	0.88	Reconcile
2.1.7. Does the plan include a description of the composition of the future population (e.g., broken down by age or gender) or a description of the future utilization of building zones?	Stevens, 2013	0.53	Reconcile
2.2. Goals			
2.2.1. Are the overall development/planning goals clearly identified?	This study	0.89	Reconcile
2.2.2. Are the specific goals of the policies clearly identified?	This study	0.94	Reconcile
2.3. Implementation			
2.3.1. Does the plan generally identify the specific organizations that are responsible for plan implementation?	Stevens, 2013	0.94	Reconcile
2.3.2. Does the plan specify for each policy whether it is ready for implementation, or whether more discussion is necessary?	This study	1	Reconcile
2.3.3. Are timelines for implementation generally specified?	Stevens, 2013	0.89	Reconcile
2.3.4. Are concrete policies generally presented along with cost estimations for their implementation?	This study	1	Reconcile
2.3.5. Does the plan contain at least one example of a conflict, or is it stated at least once that some actions have to be coordinated, weighted against another action or compensated for?	This study	0.36	Reassess
2.3.6. Does the plan contain at least one example of an action being prioritized over another?	Stevens, 2013	0.55	Reassess

2.4. Monitoring			
2.4.1. Are policies generally quantified based on measurable objectives and/or indicators?	Stevens, 2013	0.84	Reconcile
2.4.2. Does the plan contain a section or subsection that specifically addresses monitoring?	Stevens, 2013	0.94	Reconcile
2.4.3. Does the plan generally identify organizations with responsibility for monitoring?	Stevens, 2013	0.75	Reassess
2.5. Interorganizational coordination			
2.5.1 Are the main planning documents and concepts of higher institutional levels at least briefly listed (e.g., cantonal comprehensive plan, concepts)?	This study	0.22	Reassess
2.5.2. Are the main planning documents and concepts of the municipality at least briefly listed (e.g., zoning plan, building ordinances)?	This study	0.31	Reassess
2.5.3. Are the main planning documents and concepts the local plan builds on described in detail, or is it precisely explained how the local plan conforms to these documents (independently of whether these documents come from higher institutional levels or from the municipality)?	This study	0.35	Reassess
2.5.4. Does the plan include at least one example of intergovernmental coordination (e.g., coordination with the canton)?	Stevens, 2013	0.72	Reconcile
2.5.5. Does the plan include at least one example of coordination within the municipality (e.g., with another local plan)?	Stevens, 2013	0.37	Reassess
2.5.6. Does the plan include at least one example of intercommunal coordination?	This study	0.31	Reassess
2.6. Participation			
2.6.1. Are organizations and individuals that were involved in plan preparation identified?	Stevens, 2013	0.77	Reconcile
2.6.2. Are the different steps of the plan's development described?	This study	0.88	Reconcile
2.6.3. Does the plan include a separate section that describes the public participation process during the development of the plan?	Stevens, 2013	0.77	Reconcile
2.6.4. Was the broader population invited to participate in plan development already at the beginning of the planning process (e.g., workshops to set development goals in a participatory way)?	This study	0.40	Reassess
2.6.5. Is there an explanation of the participation techniques that were used?	Stevens, 2013	0.66	Reassess
2.7. Organization and presentation			
2.7.1. Does the plan include an executive summary?	Stevens, 2013	1	Reconcile
2.7.2. Does the plan include a table of contents?	Stevens, 2013	0.75	Reconcile
2.7.3. Does the plan include a glossary of terms and definitions?	Stevens, 2013	1	Reconcile
2.7.4. Are illustrations used (e.g., diagrams, pictures)?	Stevens, 2013	0.7	Reconcile
2.7.5. Are the different elements the plan is composed of listed (e.g., development concepts, plans, portfolio of concrete policies)?	This study	0.77	Reconcile

2.7.6. Does the plan include a sub-section describing the reasons that led to the development of the plan (e.g., need for more urban development, cantonal planning mandate)?	This study	0.63	Reconcile
2.7.7. Are the sections that are binding on planning officials (e.g., concrete policies) clearly distinguished from the sections that are not binding (e.g., description of the municipality, general development goals)?	This study	0.49	Reconcile

[a]Source of protocol items; [b]Value of Krippendorff's alpha; [c]Decision regarding the reliability of protocol items: "reconcile" means that the scores from both coders were simply reconciled to be included in the analysis; "reassess" means that the item had to be clarified and the scores reassessed before being reconciled and included in the analysis; "drop" means that the item was dropped from the final analysis.

4.11. Supplementary material 4.D: Standards for the interpretation of alpha scores (adapted from Stevens, Lyles, & Berke, 2014)

Plan quality dimensions	Upper standard	Lower standard
1: Few items, highly discrete (Goals; Monitoring)	0.80	0.67
2: Many items, highly discrete (Policy Focus; Implementation; Participation)	0.70	0.58
3: Few items, highly distributed	0.50	0.42
4: Many items, highly distributed (Fact base; Interorganizational coordination[1]; Organization and presentation)	0.40	0.33

[1] The dimension *interorganizational coordination* was classified by Stevens et al. in group 3 (few items, highly distributed). Since we added some items to this dimension, we reclassified it as group 4 (many items, highly distributed).

CHAPTER 5:
EVALUATING THE QUALITY AND IMPLEMENTATION OF LOCAL PLANS: AN INTEGRATED APPROACH (PAPER III)

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Submitted to *Environment and Planning B : Urban Analytics and City Science* in January 2017

Abstract: Most previous research efforts to evaluate the quality and implementation of plans have considered plans as either communication-oriented documents providing a vision to guide long-term development, or as action-oriented blueprints, the provisions of which should be strictly implemented. However, this distinction is less adapted to local plans, which present characteristics of both types of plan. Moreover, few studies have assessed whether high-quality plans are better implemented than plans of lower quality. In this article, we propose an integrated approach to link plan quality to plan implementation and a framework to assess the quality of local plans. We apply our approach and framework to a set of Swiss local plans, and our findings indicate that while local plans are both communication- and action-oriented, policies and implementation provisions remain their key components. Furthermore, the quality of the plans was found to influence their perceived usefulness for steering local development in daily planning practice but not to increase the implementation of their policies. Our integrated approach and framework could be used by local planners to evaluate the quality and implementation of their plans, improve plan-making processes and better communicate about the relevance and impacts of their plans.

Keywords: Planning evaluation, performance, conformance, communicative policy act, plan content analysis

5.1. Introduction

Plans represent a core element of planning activity, both as the output of the plan-making process and as the input for subsequent discussions and land use-related decisions (Norton, 2008). In this context, plan evaluation becomes a crucial step to ensure that planning yields expected results. Moreover, evaluation helps increase the accountability of public institutions and strengthen public confidence in planning decisions (Guyadeen & Seasons, 2016). In this sense, scholars have developed analytical approaches to evaluate plan quality (e.g., Baer, 1997; Stevens, 2013) and their implementation (e.g., Berke et al., 2006; Lyles, Berke, & Smith, 2016; Talen, 1996).

Effective plan evaluation acknowledges that plans may have different purposes and uses (Baer, 1997; Lyles et al., 2016). Over time, two directions have dominated evaluation efforts: plans seen as *visions* and as *blueprints* (Norton, 2008). *Visions* (e.g., strategies or strategic plans) are communication-oriented documents that aim at defining common goals, guiding future development and inspiring people for action (Hopkins, 2001). In contrast, plans as *blueprints* (e.g., project or land use plans) are action-oriented and focus on which precise actions should be pursued to reach specific outcomes (e.g., urban densification, hazard mitigation) (Baer, 1997).

However, Norton (2008) highlighted that in the context of local planning, plans usually do not fit into the dichotomous *vision*/*blueprint* classification. Local plans—also known as "comprehensive", "general", "master", and "community" plans in the international literature—often aim to (a) provide a vision to steer the long-term development of municipalities and (b) define policies to steer local development towards achieving this vision (Norton, 2008; Randolph, 2004; Stevens, 2013). They should serve as a guideline in the face of changing local conditions, such as political turnovers affecting municipality goals, or new higher-level requirements, which may, for example, restrict the issuance of building permits. Therefore, local plans should provide a repository where the needs and the resources of the municipality are detailed and where the decisions and alternatives discussed or agreed upon during the planning process are described. In this respect, Norton (2008) suggested viewing local plans as *communicative policy acts*. Thus, it is crucial to develop evaluation approaches going beyond the strict *vision*/*blueprint* distinction to assess the quality and implementation of local plans.

Interestingly, little effort has been put into investigating whether plan quality influences implementation (Guyadeen & Seasons, 2016; Lyles & Stevens, 2014). Among the few authors who approached this issue at a local level, Brody and Highfield (2005) observed that plans containing specific implementation provisions—such as monitoring programs—succeeded better at containing wetland development in Florida (U.S.), while Berke et al. (2006) concluded that the quality of local sustainability plans affected their implementation in New Zealand. In contrast, Norton (2005a) found that plan quality did not influence the use of plans by local official for decision-making processes in North Carolina (U.S.). The limited attention directed towards the influence of plan quality on implementation is a major gap in planning evaluation and restricts the understanding of the impact and relevance of plans.

To contribute to recent debates on planning evaluation, this paper proposes an integrated approach that allows the linking of plan quality to plan implementation and a framework to evaluate the quality of local plans. The approach and framework are applied to a set of Swiss local plans (*Richtplan*) to answer the following research

questions. First, what is the quality of local plans? Second, are local plans successfully implemented? Third, does the quality of local plans influence their implementation?

5.2. Current methods for evaluating plan quality and implementation

5.2.1. Measuring plan quality:

Irrespective of whether plans are implemented at a state, regional, or local scale, their evaluation should be adapted to their purpose (Lyles et al., 2016). To evaluate the quality of plans viewed as *visions*, one should use communication-oriented dimensions of plan quality and assess whether their design is accessible to the wider public and whether they entail a narrative storyline to motivate stakeholders and improve their commitment towards the goals of the plans (Bunnell & Jepson, 2011). Plans conceived as *blueprints* entail a list of policies to guide policy-making, and their evaluation generally implies using action-oriented dimensions of plan quality to check whether the plans contain provisions to ensure consistent implementation (Baer, 1997; Hopkins, 2001). According to this view, good plans should precisely describe who is in charge of implementing the policies and over what timescale.

Because local plans entail a long-term vision as well as precise implementation provisions, they are both communication- and action-oriented, and their evaluation implies assessing both dimensions of plan quality. However, with the exception of two recent studies (Berke, Spurlock, Hess, & Band, 2013; Lyles, Berke, & Smith, 2014), previous research efforts have not specified whether the dimensions of plan quality they examined were communication- or action-oriented. Early scholars who developed plan-evaluation protocols examined three main dimensions: a "fact base" to describe the local context at the time of the plan's development (e.g., geographical and socio-economic conditions); "goals" to identify future desired conditions; and "policies" to determine practical strategies aimed at attaining the goals (Berke & French, 1994; Deyle & Smith, 1998). Godschalk et al. (1999) added the following four dimensions: "implementation" and "monitoring" to describe how policies should be implemented – respectively evaluated – to reach the desired goals; "interorganizational coordination" to specify how policies should be coordinated with other plans or agencies; and "participation" to document the public participation process set up during the development of the plan. Recently, Stevens (2013) built on the dimensions mentioned above to assess the quality of local plans in British Columbia (Canada) and added an "organization and presentation" dimension to judge the user-friendliness of plans.

Over recent decades, more than 47 peer-reviewed studies (Lyles & Stevens, 2014) have used all or part of these dimensions of plan quality to evaluate how local, state, and regional plans address specific policy issues, such as the mitigation of natural hazards (Berke & French, 1994) or the promotion of affordable housing (Hoch, 2007), smart growth (Edwards & Haines, 2007), and sustainable development (Conroy & Berke, 2004). However, the evaluation protocols used in most of these studies are contingent on the purpose of the plans under study, and they are not adapted for comparisons across policy issues. For example, Edwards and Haines (2007, p. 55) evaluated whether local plans entailed policies to "create walkable communities" and "provide a variety of transportation choice". While these items are suitable to the analysis of smart growth, they would not apply to other policy issues such as affordable housing or hazard mitigation. Hence, it would be useful to have protocols

applicable across a broad range of plans. Norton (2008) recognized this need and suggested distinguishing between the policy focus and formal quality of plans. According to his definition, policy focus relates to the policy message conveyed by the plan, such as the mitigation of natural hazards or the management of urban sprawl (i.e., "policies" dimension in Stevens' protocol), whereas formal quality relates to how the policy message is expressed, justified, and implemented (i.e., other plan quality dimensions in Stevens' protocol). Following this distinction, protocols designed for the evaluation of the formal quality of plans should be independent of the policy issue at stake in order to be used across a broad range of plans.

5.2.2. Measuring plan implementation:

In line with the two main purposes attributed to plans in the literature (i.e., visions or blueprints), the assessment of plan implementation follows either a performance or a conformance approach (Alexander & Faludi, 1989; Guyadeen & Seasons, 2016; Lyles et al., 2016; Oliveira & Pinho, 2010). The performance approach is applied when plans are considered visions, and it focuses on the planning process (Faludi, 2000). It considers plans to be successfully implemented if they are useful in supporting decision-making regardless of whether they influence planning outcomes such as urban densification or hazard reduction (Laurian et al., 2004; Mastop & Faludi, 1997). At a local level, Norton (2005b) followed this approach to study whether local plans shaped the land-use decisions of locally elected officials in North Carolina, and Lyles, Berke and Stevens (2016) assessed whether plans were effective at coordinating hazard mitigation with other planning goals.

The conformance approach considers plans as *blueprints,* of which the prescriptions should be reflected in actual spatial development (Laurian et al., 2004; Mastop & Faludi, 1997; Talen, 1997). Consequently, this approach assumes that plans are successfully implemented if (1) their policies are executed and/or (2) they influence the outcome of planning on the ground (Alexander & Faludi, 1989; Oliveira & Pinho, 2010). For example, Lyles et al. (2016) assessed the proportion of policies actually implemented in the context of hazard mitigation. Alternatively, Loh (2011) compared planned and actual land uses in four municipalities in Michigan (U.S.).

Some recent studies have argued for combining performance and conformance approaches (e.g., Oliveira & Pinho, 2010). Guyadeen and Seasons (2016) referred to this pragmatic line of research as an integrative approach. For example, in the context of local planning, Lyles et al. (2016) relied on a survey of local officials to evaluate the performance and conformance of local hazard mitigation plans in the United States. At a regional scale, Feitelson et al. (2017) combined both performance and conformance approaches to evaluate regional land use plans in Israel and noted that high conformance is not necessarily linked to high performance. Similarly, at a national scale, Altes (2006) studied national urbanization policies in the Netherlands and showed that performance and conformance are independent because the plan under study did not influence decision-making regarding housing stagnation (i.e., poor performance) but succeeded at steering urban development as expected (i.e., high conformance).

5.3. Integrated approach towards assessing the quality and implementation of local plans

Based on the concepts presented in sections one and two, we developed an integrated approach resting upon two elements:

(a) The framework for assessing plan quality (for details, see section 5.3.1) comprising the following:

- An analysis of the communication- and action-oriented dimensions of plan quality
- A classification of local plans according to their scores on communication- and action-oriented dimensions into the three main types of plans described in the literature (i.e., *visions*, *blueprints*, and *communicative policy acts*)

(b) The assessment of the relationship between plan quality and plan implementation: this is accomplished by relating communication- and action- oriented scores of the plans (plan quality) with their performance and conformance.

5.3.1. Framework for assessing plan quality:

Stevens' protocol (2013) was used as the starting point of framework development because it assesses both the communication- and action-oriented dimensions of plan quality. His protocol was adapted to the Swiss planning context and to the purpose of the study. To allow a comparison across plans addressing different policy issues, we focused on the formal quality of the plans and did not include any protocol item related to the policy focus of the plans. Consequently, we removed from Stevens' protocol (2013, p. 485) all "policy" items (e.g., "Does the plan contain at least one specific policy or action related to food and/or agriculture?") and summarized several of the detailed "fact base" and "goal" items (e.g., "Does the plan include a descriptive statement about air quality/water bodies in the community?") into more general statements applicable across policy issues (e.g., "Does the plan include a section that precisely describes the municipality's general situation?"). After the adjustments made to Stevens' (2013) protocol, our final evaluation protocol contained 36 items grouped into seven dimensions of plan quality. A list of the plan quality dimensions as well as the corresponding protocol items are reported in supplementary material 5.A.

Dimensions that aim at describing the local context, detailing the long-term goals, and documenting and justifying the planning process were classified as communication-oriented (Fig. 5.1). Dimensions providing provisions for effective implementation were categorized as action-oriented. The "interorganizational coordination" dimension was divided into two groups because three of its items are communication-oriented (i.e., 5.a.1.-5.a.3), whereas the three others are action-oriented (i.e., 5.b.1-5.b.3).

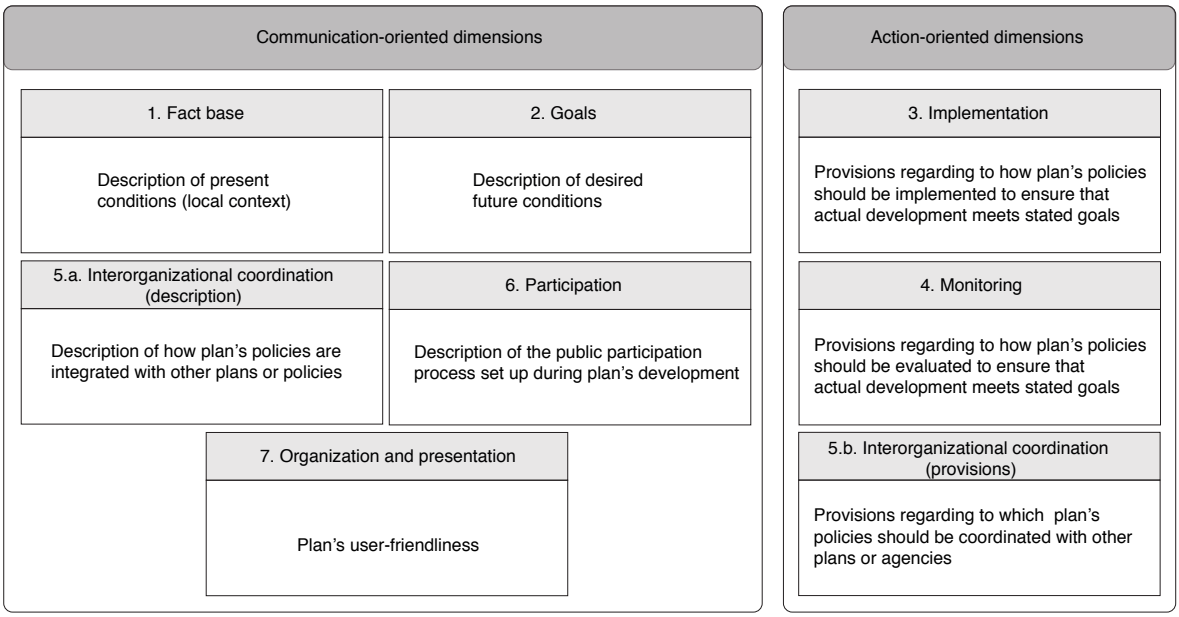

Figure 5.1. Dimensions of plan quality.

Finally, we used a system of coordinates to visually represent the quality of the plans according to their overall score on communication- (x-axis) and action-oriented dimensions (y-axis), both measured on a scale from 0 (low quality) to 100 (high quality) (see Supplementary material 5.B for an illustration). The coordinate system defines four quadrants, of which quadrants I, II, and IV can be related to three types of plans described in the literature:

Quadrant I: Plans that are both highly communication- and action-oriented can be related to Norton's (2008) definition of *communicative policy acts*

Quadrant II: Plans presenting a low quality along the communication-oriented dimension but a high quality along the action-oriented dimension can be related to the notion of *blueprint* described by Baer (1997)

Quadrant IV: Plans with high quality along the communication-oriented dimension but low quality along the action-oriented dimension can be related to *visions* in the sense of Baer (1997) and Hopkins (2001)

Plans situated in quadrant III have low quality in both the communication- and action-oriented dimensions and represent examples of weak local plans.

To evaluate the quality of the local plans, we followed the recommendations from Berke and Godschalk (2009) and Lyles and Stevens (2014) regarding the administration of the protocol and the reliability of the coding process. Two coders were trained, and they then tested a draft version of the protocol on five plans that were not included in the sample. After this trial phase, the protocol was refined and enhanced. The two coders worked independently and assigned each item a score of 1 when it was present and a score of 0 otherwise. We assessed the reliability of the measurements by calculating Krippendorff's alpha (Krippendorff, 2013) for each item (see supplementary material 5.A) and by applying the upper and lower standards recommended for each dimension of plan quality by Stevens et al. (2014). Items with alpha scores above upper standards were included in subsequent

analyses once the differences between the coders were reconciled. For items with alpha scores between upper and lower standards, the differences between coders were reconciled after a clarification and reassessment of the protocol. The same procedure was followed for items with alpha scores below lower standards. We chose not to drop items with a low alpha score from the analysis because their exclusion would have considerably lowered the thematic breadth of the study. However, we identified the reasons for these low alpha scores and carefully reassessed the corresponding items. To ensure transparent results, we provide the initial alpha scores in supplementary material 5.A. The analysis yielded overall robust results because 83% of the protocol items presented alpha scores above upper standards and could be reconciled without a reassessment of the protocol.

For each plan and each dimension of plan quality, we computed index scores in three steps (Berke et al., 2013, p. 454). First, the scores of the protocol items were summed within each dimension. Second, the summed scores were divided by the total possible score for each dimension. Finally, this fractional score was multiplied by 100 to place each index on a scale ranging from 0 to 100. To determine the extent to which plans are communication- and action-oriented, we summarized the corresponding plan quality dimensions as presented in Fig. 1 and used the same standardization process as described above.

5.3.2. Assessing performance and conformance:

To assess the conformance and performance of the plans, we sent a questionnaire to the main planning officer of the sampled municipalities. To assess performance, local planners were asked to evaluate the usefulness of their plan for day-to-day planning practice on a 0 to 10 scale (0 = not useful at all; 10 = very useful, helping to steer the development of the municipality in daily practice). To assess conformance, the respondents were asked to estimate the proportion of policies they expected to be completed or at least further examined before the end of the plan's lifespan on a 0 to 100% scale. We did not assess whether local plans influenced the outcome of planning on the ground (e.g., urban densification, hazard mitigation) because most of the sampled plans have been adopted too recently to show such impacts. We used Spearman's correlation coefficients to assess whether the communication- and action-oriented dimensions of the plans had an effect on their performance and conformance because all variables were measured on the ordinal scale (Conover, 1999).

5.3.3. Study area and sample selection to test the integrated approach:

To test our proposed framework, we selected municipalities in federalist Switzerland, which is organized in 26 cantons. Federal, cantonal and local governments are jointly responsible for spatial planning (Newman & Thornley, 1996), but municipalities hold the greatest decision-making power regarding local planning (Mann, 2009). They are required by federal law to develop a land use plan (*Nutzungsplan*) binding to land owners. However, cantonal governments can impose planning mandates to oblige their municipalities to develop local plans (*Richtplan*), which may be sectorial—in which case they focus on a specific policy issue, such as energy or landscape protection— or comprehensive, which allows them to coordinate several goals (Gilgen, 2012). Recently, Kaiser et al. (2016) conducted a survey of local planning instruments and found that 53.0% of Swiss municipalities had a local plan in place in 2014. In addition, their results indicated that the use of local plans increased steadily between 1970 and 2014 and that municipalities with a large number of inhabitants are more likely to develop local plans than their smaller counterparts.

Through its position at the intersection of Germanic and Romance Europe, Switzerland spans over four linguistic and cultural regions (i.e., German, French, Italian, and Romansh). For capacity reasons, the present study is limited to the German-speaking region. This area is divided into 1470 municipalities, covers 28,971 km^2 and comprises 71% of the total Swiss population (5,758,699 inhabitants) (BFS, 2014).

To select the local plans, we used stratified sampling (Gregoire & Valentine, 2007) according to the population size of the municipality (< 1,000 inhabitants; 1,000 – 4,999; 5,000 – 9,999; > 9,999) because previous studies (e.g., Edwards & Haines, 2007; McDonald & McMillen, 2004) revealed that population size may influence local planning practices. In each stratum, we randomly selected ten municipalities and collected their plans. After initial analysis, three plans were removed from the sample because they did not cover the entire municipal territory. The final sample included 37 local plans, a large majority of them (65%) being comprehensive, while the remaining ones (35%) focused on selected issues such as transportation, utilities provision, energy supply, and landscape protection (see supplementary material 5.C).

5.4. Results

5.4.1. Quality of local plans:

The analysis confirmed that local plans were both communication- and action-oriented but revealed that overall their action-oriented dimensions were stronger (Fig. 5.2.). The graph shows that most plans clustered in quadrant II (13 plans), followed by quadrant I (11) and III (6). In contrast, no plan was classified in quadrant IV. These results imply that the sampled local plans related most closely to *blueprints* and *comprehensive policy acts* but not to *visions*.

The content analysis of the plans yielded complementary qualitative information that highlighted the differences among the main types of plans. Plans that most closely met the characteristics of *communicative policy acts* (e.g., P16, P14, and P6, which scored high in both dimensions of plan quality) were almost always divided into several sections that were clearly written and could be understood independently from each other. For example, plan P14 comprises four different sections. The first describes the purpose of the plan, details how it is embedded within other local planning activities and instruments, and provides an overall table of contents. The second section describes the plan-making process, while the third section entails an analysis of local conditions and a description of the development goals of the municipality for each planning topic (e.g., urban development, landscape protection, and mobility). The last section comprises a collection of policies with detailed implementation provisions assembled into an action plan.

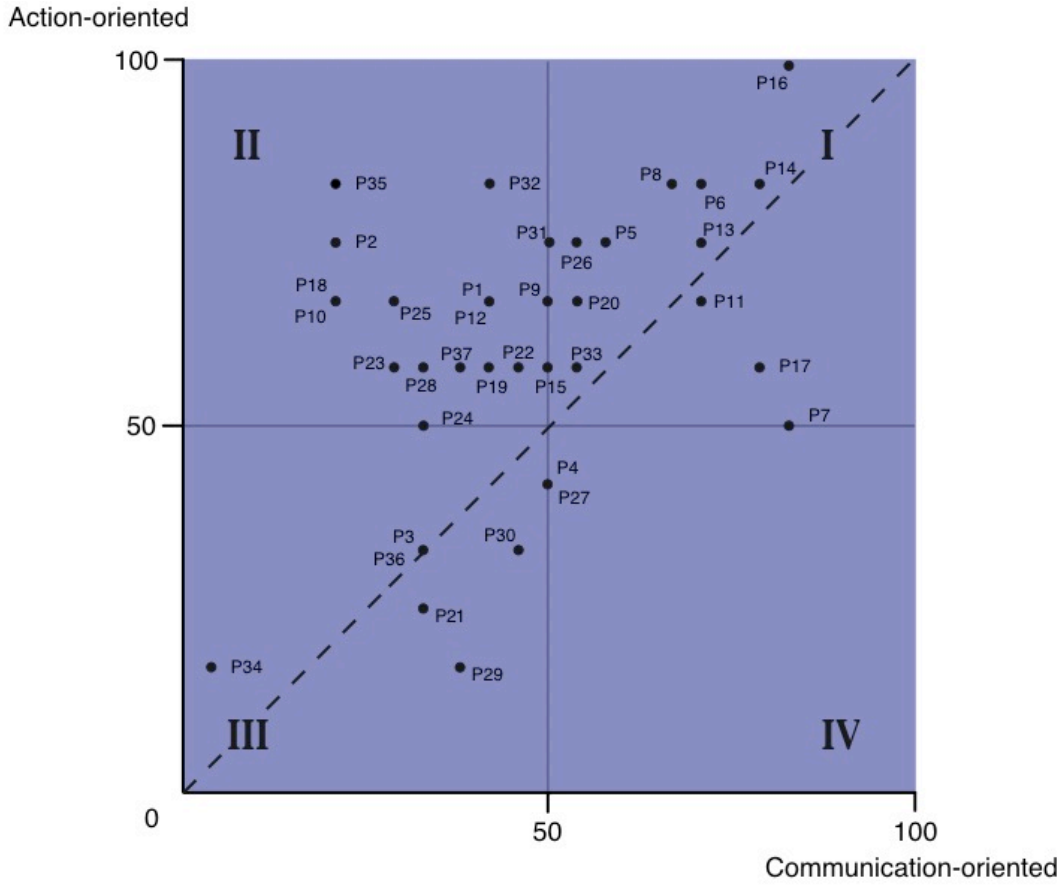

Figure 5.2. Quality of the sampled local plans as measured by their communication- and action-oriented dimensions. The plans situated in three of the four quadrants can be related to three types of plans described in the literature: *visions* (quadrant IV), *blueprints* (II), and *communicative policy acts* (I). The plans situated in quadrant III have both a low communication- and action-oriented content and represent examples of weak local plans.

The three plans in quadrant I with higher communication-oriented than action-oriented scores (i.e., plans P11, P17, and P7) had similar characteristics. However, they entailed much less detailed implementation provisions. For example, plan P7 also comprised an action plan; however, the agencies responsible for the implementation of the policies were not identified, and the plan entailed no timetable for implementation.

In contrast, the plans situated in quadrant II were overall much shorter, presented characteristics similar to *blueprints*, and usually comprised a single section. Most of these plans only entailed an action plan with concrete policies and detailed implementation provisions. Information related to the plan-making process or the local context of the municipality was sometimes included in other planning documents, namely an independent planning report (*Planungsbericht*) in the case of plans P35 and P2.

Finally, the plans situated in quadrant III had both low communication-oriented and implementation-oriented quality, and they were not very detailed. In general, they did not address long-term planning issues, such as energy provision or the coordination of urban development and mobility, but rather limited themselves to listing which plots of land should be assigned to specific land uses, such as development or conservation areas. As a result, they failed to provide a flexible guideline to steer municipal development in the face of changing conditions and rather acted like justifications for the preparation of binding land use plans.

The mean scores per dimension provide more detailed indication regarding which aspects of plan quality have been met in our sample (Fig. 5.3.). They reveal that local plans generally entail precise information regarding which actions should be coordinated to attain the stated goals (mean "inter-org. coord." scores > 80). In contrast, development goals are sometimes unclear (mean "goals" score = 61), and some plans miss specific provisions regarding the practical implementation of the policies (mean "implementation" score = 59). In addition, numerous plans do not entail a description of the public participation process set up during their development (mean "participation" score = 42), and many of them are not designed to attract attention from a broad audience (mean "organization and presentation" score = 47). Finally, the lowest scores were reached by the dimensions "fact base" and "monitoring" (mean scores < 40), which indicates that local conditions, such as geographical and socio-economic characteristics, are often insufficiently described, and many plans lack a section detailing long-term monitoring and evaluation of the policies.

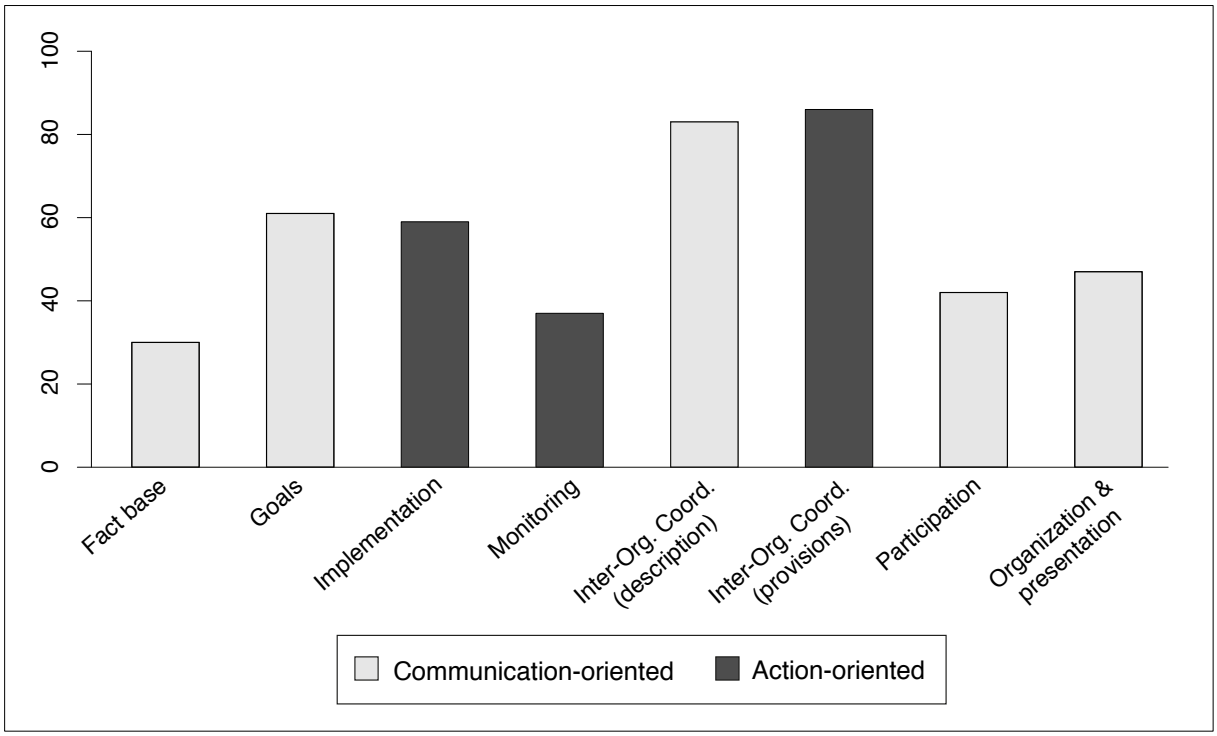

Figure 5.3. Mean scores per dimension.

5.4.2. Performance and conformance of local plans:

Local plans had a rather high performance, as most local officers found their plans useful for day-to-day planning activities (Fig. 5.4.A.). The majority of local officers (67%) rated their usefulness between 5 and 8. A small proportion of respondents (12%) indicated that their plans were not useful to their municipality (scores below 5), while almost 25% of local planners attributed a score above 8 to their plan, indicating that it was very useful for steering the development of their municipality on a daily basis.

The conformance of the plans was also rather high because 40% of the planning officers expected that approximately half (41 – 60%) of the policies contained in their plan would be implemented before the end of its lifespan (Fig. 5.4.B.). An equal proportion of officers expected that between 60% and 100% of the policies would be completed.

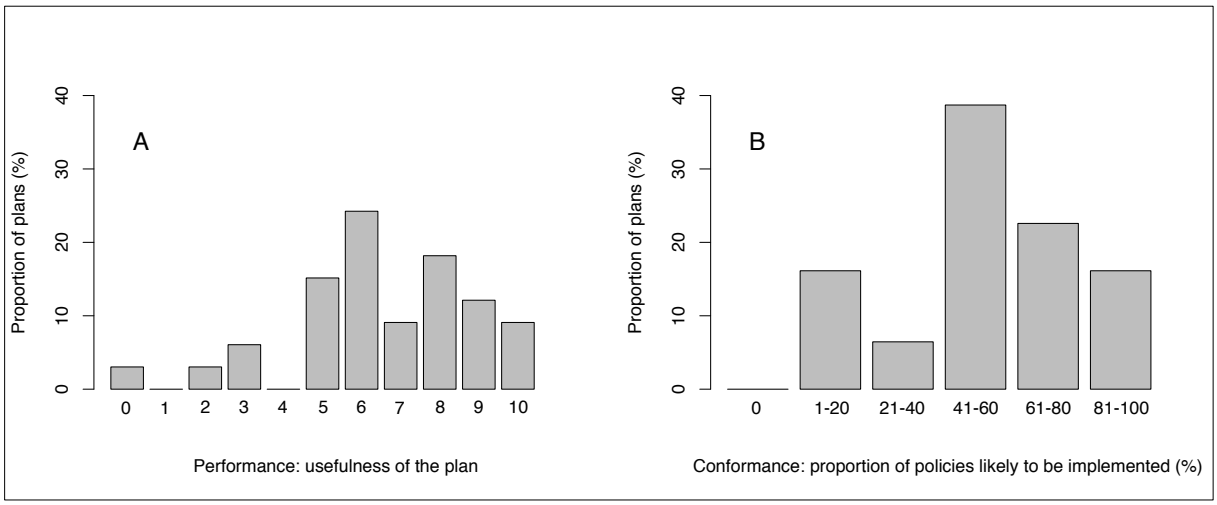

Figure 5.4. Measure of the (A) performance and (B) conformance of local plans as assessed by local planning officers.

5.4.3. Linking communication- and action-oriented dimensions of plan quality with performance and conformance:

The performance of the plans, i.e., their usefulness for day-to-day practice, was positively correlated with their quality for communication-oriented (Fig. 5.5.A.) as well as action-oriented dimensions (Fig. 5.5.B.). These results were confirmed by statistical analyses, which revealed a moderate but significant correlation in the first case (correlation coefficient = 0.42) and a strong significant correlation in the latter case (0.58).

The results were more ambiguous regarding conformance, i.e., the proportion of policies likely to be implemented (Fig. 5.5.C. and D). While weak positive correlations were identified for both the communication- (correlation coefficient = 0.23) and action-oriented dimensions (correlation coefficient = 0.28) of the plans, these results were not statistically significant.

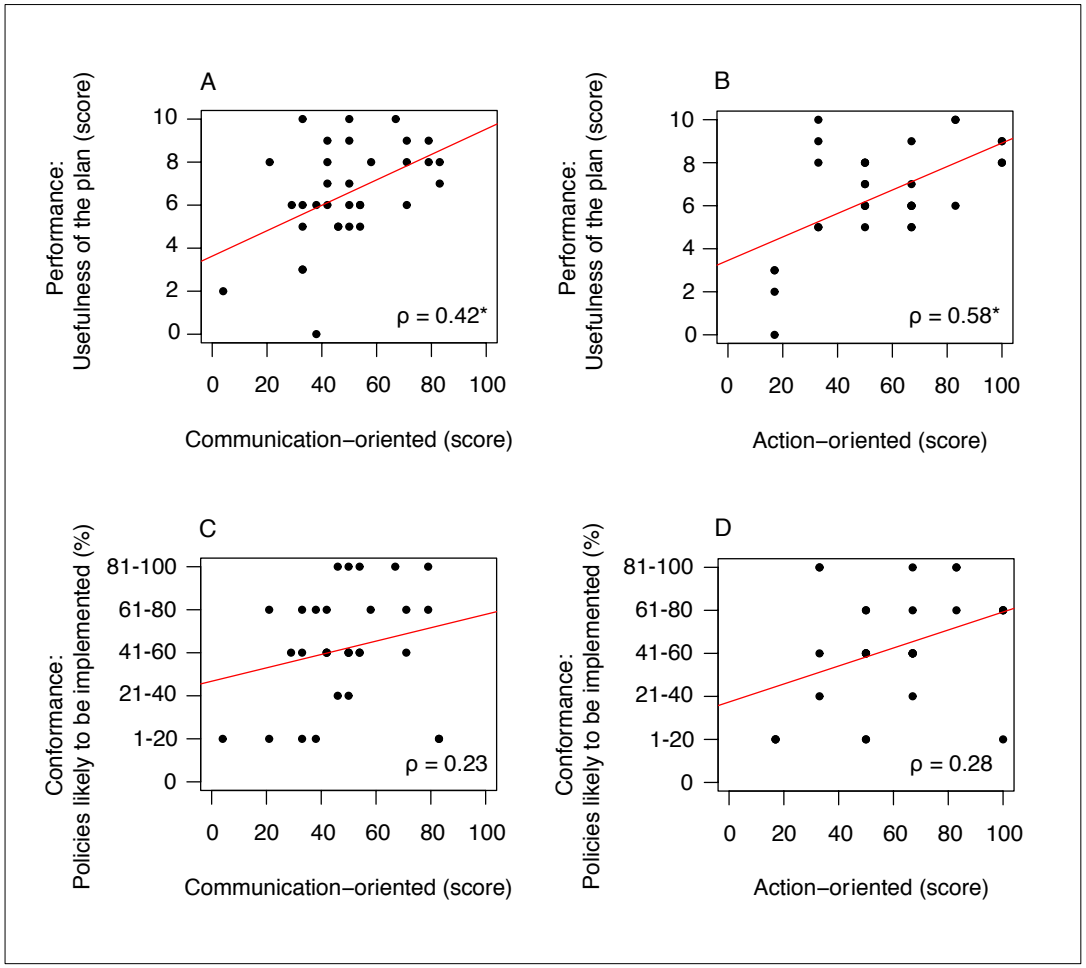

Figure 5.5. Correlation between the quality and implementation of plans. In the first row, the communication– (A) and action-oriented dimensions (B) are correlated with their performance. In the second row, the communication- (C) and action-oriented dimensions (D) are correlated with their conformance. Statistically significant Spearman's correlation coefficients (ρ) are indicated by a star ($p < .05$).

5.5. Discussion

The approach developed in this article is well embedded within existing theoretical concepts and analytical procedures, and it contributes to bridging the traditional distinction between vision and blueprint that prevails in plan-evaluation studies. The analysis empirically confirms that Swiss local plans often combine communication and action-oriented dimensions. However, contrary to Norton's assumption (2008), less than half of the local plans qualify as communicative policy acts.

Indeed, policies and implementation provisions remain their core elements. One example for a successful combination of communication and action-oriented dimensions is plan P14: it entails a section describing the desire of municipal authorities to promote nearby recreation (among others) and concrete policies to show how this objective will be pursued, such as the realization of new walking and cycling trails.

5.5.1. Insights from communication- and action-oriented dimensions of quality:

Whether our results indicate appropriate levels of plan quality depends on which purpose these plans are supposed to fulfil. For example, if a municipal government wishes for its local plan to act as a flexible development guideline in the sense of a *communicative policy act*, its plan should present a high quality on both the communication- and action-oriented dimensions. However, not all local plans may need to meet these characteristics. For example, large cities with a professional planning administration may prefer to limit their plans to a list of policies and implementation provisions similar to a *blueprint*. They may already have other planning documents detailing their local context and development goals (e.g., strategic plan, concept of development), and they may not want to overload their local plans. In contrast, small municipalities without professional planners may need a plan that is more in line with the notion of a *communicative policy act* in order to assemble all important planning-related information into a single document and facilitate policy continuity in case of political turnovers. In a study about the inclusion of smart growth principles in U.S. local plans, Edwards and Haines (2007) similarly acknowledged that small municipalities need different plans and policies than their larger counterparts. Future studies could use our approach to assess how factors, such as population size or local planning capacity, shape the communication- and action-oriented dimensions of plans and explore how to better adapt local plans to the needs of municipalities.

The analysis further reveals that many plans have only moderate scores for the communication- and/or action-oriented dimensions. The analysis of individual plan quality scores provides more insights into the main strengths and weaknesses of the local plans and allows recommendations to be made to improve their general quality. Overall, the scores indicate moderate quality and present similar patterns as those found in a study by Lyles et al. (2014), who assessed the quality of local hazard mitigation plans in six U.S. states. To strengthen the communication-oriented dimensions of their plans, people in charge of plans could start by better describing the local context in order to strengthen sense of place and help local officials and stakeholders recognize the unique characteristics of their municipality. Additionally, the participation process set up during plan development could be made more transparent, and the organization and presentation of the plans could be enhanced to make them accessible to a broad audience. Regarding the action-oriented dimensions of plan quality, the people responsible for plans should mainly focus their efforts towards improving the level of detail of the implementation and monitoring provisions of the policies. To improve clarity, they could assemble these provisions into an action plan, as suggested by Stevens (2013).

5.5.2. Influence of plan quality on implementation:

Local plans had a rather high performance and conformance, indicating that local planning officers value their plans and use them in daily planning practice and that most municipalities are committed to implementing their plans. The quality of the plans significantly influenced their performance—i.e., their usefulness for steering municipal development in day-to-day planning practice—when measured according to both the communication- and action-oriented dimensions of the plans. This reveals that local officers not only found their plans more useful if they entailed clear descriptions of the local context, the plan-making process and the goals of the municipality but also if they encompassed detailed policies and implementation provisions. These results are

very encouraging for the Swiss planning community, as they confirm the benefit of high-quality plans.

In light of our results showing that the communication-oriented dimensions of local plans also contribute to their performance and conformance, we suggest that future plan evaluation studies should take into account both the communication- and action-oriented dimensions of plan quality.

In addition, the present analysis reveals that the impact of plan quality on implementation differs according to whether implementation is measured in terms of performance or conformance. When implementation was defined and measured in terms of performance, the communication- and action-oriented dimensions of plan quality had an important influence. Alternatively, when implementation was defined in terms of conformance, the influence was less clear. A possible explanation for these results may be that numerous factors other than plan quality, such as local political will, financial and planning capacity, or higher-level planning prescriptions can affect conformance. Consequently, high-quality plans may not be sufficient to ensure successful policy implementation, whereas plan performance—measured as the usefulness of the plans in daily planning practice—may be less influenced by such additional factors.

Furthermore, it is a challenge to measure conformance and performance. We relied on the assessment of local planners to measure these aspects. The tendency of the respondents to deliver socially desirable answers may have introduced some bias into our analysis. Stronger measures of performance and conformance could be obtained by consulting official reports documenting implementation progresses, if available. For example, Berke et al. (2006) relied on development permits in their evaluation of local plans and implementation practices in New Zealand and concluded that plan quality had an important influence on conformance but not on performance. More in-depth evaluations in different local contexts and with a focus on multiple aspects of conformance (e.g., outcome of planning on the ground) and performance (e.g., importance of the plan to coordinate several planning issues) are necessary to increase our understanding of the relationship between plan quality and implementation.

5.6. Conclusions

Evaluation has gained much attention in the public sector since the 1990s in the context of increased demand for accountability by elected officials and local stakeholders (Bernstein, 2001) and the application of New Public Management (NPM) practices (Gerber, 2016; Guyadeen & Seasons, 2016), which call for more evidence-based policy-making and aims to increase the efficiency of public administrations (Mueller & Hersperger, 2015). The approach presented in this article distinguishes between the communication- and action-oriented dimensions of plans, which accounts for the fact that local plans may present different characteristics depending on their purpose. This conceptual distinction facilitates the evaluation of the quality, performance, and conformance of plans in the context of local planning and provides an innovative and transparent scheme that could easily be applied by planners. The administration of the protocol is straightforward, and the calculation of the plan quality scores only requires basic numeracy skills. Planners could use this approach for in-house evaluation to support continuous learning, improve future plan-making processes and assess whether their plans have succeeded at steering local development as expected. Furthermore, the approach could provide planners with a solid basis to

communicate the quality of their plans and legitimize their professional activity. State governmental agencies could use the proposed framework to systematically evaluate the quality of the local plans developed by municipalities within their jurisdiction. The visual representation could help to identify differences among plans, guide municipalities towards enhancing low-quality plans and identify high quality, best-practice plans. Because our approach is strictly assessing formal quality, it is suitable for the evaluation of local plans in different national planning contexts and across a wide range of policy issues.

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5.8. Supplementary material 5.A: Protocol to assess the quality of local plans

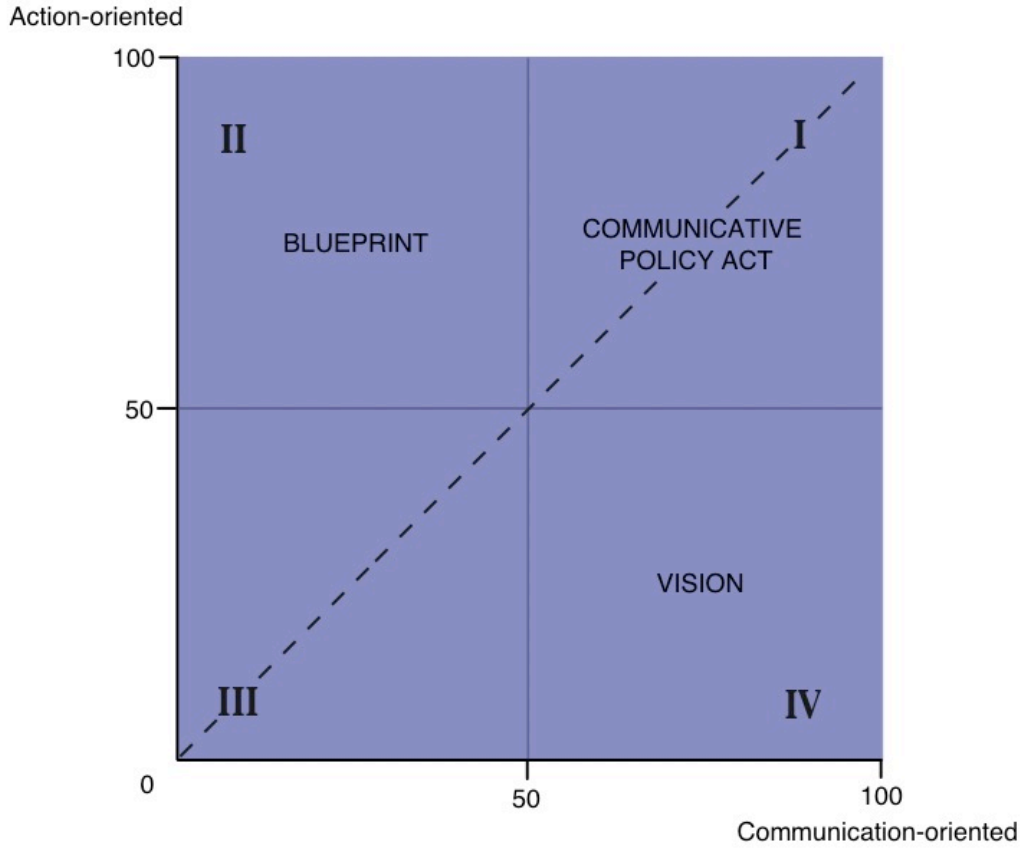
	Source[a]	Alpha[b]	Decision[c]
1. Fact base			
1.1. Does the plan include a separate section that precisely describes the municipality's general situation (e.g., topography, landscapes, economic development, urban development, public infrastructure)?	This study	0.60	Reconcile
1.2. Does the plan include, for the main planning issues, a detailed description of the municipality's general situation in this specific planning realm?	This study	0.41	Reconcile
1.3. Does the plan include, for most policies, a short description of the municipality's general situation regarding the specific issue?	This study	0.45	Reconcile
1.4. Does the plan include a description of the size of the present population?	Stevens, 2013	0.82	Reconcile
1.5. Does the plan include a description of the composition of the present population (e.g., broken down by age or gender) or a description of the present utilization of building zones?	Stevens, 2013	0.75	Reconcile
1.6. Does the plan include a description of the size of the future population?	Stevens, 2013	0.87	Reconcile
1.7. Does the plan include a description of the composition of the future population (e.g., broken down by age or gender) or a description of the future utilization of building zones?	Stevens, 2013	0.53	Reconcile
2. Goals			
2.1. Are the overall development/planning goals clearly identified?	This study	0.92	Reconcile
2.2. Are the specific goals of the policies clearly identified?	This study	0.89	Reconcile
3. Implementation			
3.1. Does the plan generally identify the specific organizations that are responsible for plan implementation?	Stevens, 2013	0.89	Reconcile
3.2. Does the plan specify for each policy whether it is ready for implementation, or whether more discussion is necessary?	This study	0.95	Reconcile
3.3. Are timelines for implementation generally specified?	Stevens, 2013	0.95	Reconcile
3.4. Are concrete policies generally presented along with cost estimations for their implementation?	This study	0.92	Reconcile
3.5. Does the plan contain at least one example of a conflict, or is it stated at least once that some actions have to be coordinated, weighted against another action or compensated for?	This study	0.28	Reassess
3.6. Does the plan contain at least one example of an action being prioritized over another?	Stevens, 2013	0.49	Reassess

4. Monitoring			
4.1. Are policies generally quantified based on measurable objectives and/or indicators?	Stevens, 2013	0.86	Reconcile
4.2. Does the plan contain a section or subsection that specifically addresses monitoring?	Stevens, 2013	0.95	Reconcile
4.3. Does the plan generally identify organizations with responsibility for monitoring?	Stevens, 2013	0.65	Reassess
5.a. Interorganizational coordination (descriptive)			
5.a.1. Are the main planning documents and concepts of higher institutional levels at least briefly listed (e.g., cantonal comprehensive plan, concepts)?	This study	-0.1	Reassess
5.a.2. Are the main planning documents and concepts of the municipality at least briefly listed (e.g., zoning plan, building ordinances)?	This study	0.47	Reassess
5.a.3. Are the main planning documents and concepts the local plan builds on described in detail, or is it precisely explained how the local plan conforms to these documents (independently of whether these documents come from higher institutional levels or from the municipality)?	This study	0.51	Reconcile
5.b. Interorganizational coordination (prescriptive)			
5.b.1. Does the plan include at least one example of intergovernmental coordination (e.g., coordination with the canton)?	Stevens, 2013	0.77	Reconcile
5.b.2. Does the plan include at least one example of coordination within the municipality (e.g., with another local plan)?	Stevens, 2013	0.53	Reconcile
5.b.3. Does the plan include at least one example of intercommunal coordination?	This study	0.62	Reconcile
6. Participation			
6.1. Are organizations and individuals that were involved in plan preparation identified?	Stevens, 2013	0.84	Reconcile
6.2. Are the different steps of the plan's development described?	This study	0.88	Reconcile
6.3. Does the plan include a separate section that describes the public participation process during the development of the plan?	Stevens, 2013	0.79	Reconcile
6.4. Was the broader population invited to participate in plan development already at the beginning of the planning process (e.g., workshops to set development goals in a participatory way)?	This study	0.41	Reassess
6.5. Is there an explanation of the participation techniques that were used?	Stevens, 2013	1	Reconcile
7. Organization and presentation			
7.1. Does the plan include an executive summary?	Stevens, 2013	1	Reconcile
7.2. Does the plan include a table of contents?	Stevens, 2013	0.72	Reconcile
7.3. Does the plan include a glossary of terms and definitions?	Stevens, 2013	1	Reconcile
7.4. Are illustrations used (e.g., diagrams, pictures)?	Stevens, 2013	0.67	Reconcile
7.5. Are the different elements the plan is composed of listed (e.g., plans, portfolio of concrete policies)?	This study	0.73	Reconcile

7.6. Does the plan include a sub-section describing the reasons that led to the development of the plan (e.g., need for more urban development, cantonal planning mandate)?	This study	0.62	Reconcile
7.7. Are the sections that are binding on planning officials (e.g., concrete policies) clearly distinguished from the sections that are not binding (e.g., description of the municipality, general development goals)?	This study	0.56	Reconcile

[a]Source of the protocol's items; [b]Value of Krippendorff's alpha; [c]Decision regarding the reliability of the protocol's items: "reconcile" means that the scores from both coders were simply reconciled to be included in the analysis; "reassess" means that the protocol had to be clarified and the scores reassessed before being reconciled and included in the analysis

5.9. Supplementary material 5.B: Coordinate system



Supplementary material 5.B. Coordinate system to visualize the quality of local plans according to their communication- and action-oriented dimensions. The dashed line indicates the boundary between plans that are mainly communication- (below the dashed line) or action-oriented (above the dashed line). The plans situated in quadrants I, II, and IV can be related to three types of plans described in the planning literature.

5.10. Supplementary material 5.C: Results of the analyses for the individual plans

Local plan	Type of plan	Population	Fact base	Goals	Implementation	Monitoring	Inter-Org. Coord. (description)	Inter-Org. Coord. (provisions)	Participation	Organization and presentation	Communication-oriented dimension	Implementation-oriented dimension	Performance	Conformance
P1	Comprehensive	74581	14	0	50	67	67	100	60	57	42	67	7	41-60
P2	Comprehensive	26542	0	50	83	33	100	100	0	14	21	75	NA	NA
P3	Comprehensive	25801	14	0	17	0	100	100	20	43	33	33	3	41-60
P4	Comprehensive	20799	14	50	33	0	100	100	60	57	50	42	9	41-60
P5	Comprehensive	18839	14	100	50	100	100	100	40	86	58	75	8	61-80
P6	Transport	15192	29	100	67	100	100	100	100	71	71	83	9	41-60
P7	Comprehensive	12698	86	100	50	0	100	100	100	57	83	50	7	21-40
P8	Energy	11651	43	100	83	67	100	100	60	71	67	83	10	81-100
P9	Landscape	11651	0	100	83	0	100	100	40	71	50	67	10	81-100
P10	Comprehensive	10535	0	50	50	100	33	67	20	29	21	67	1	21-40
P11	Comprehensive	9836	71	100	50	67	100	100	60	57	71	67	8	NA
P12	Utilities and transport	7554	14	100	67	67	67	67	20	57	42	67	6	41-60
P13	Comprehensive	6585	57	100	83	33	100	100	80	57	71	75	6	61-80
P14	Comprehensive	6144	71	100	100	33	100	100	100	57	79	83	9	61-80
P15	Comprehensive	6084	29	50	50	33	67	100	40	71	50	58	6	41-60
P16	Energy	6084	57	100	100	100	100	100	80	100	83	100	8	1-20
P17	Comprehensive	5828	86	50	33	67	100	100	80	71	79	58	8	81-100
P18	Utilities and transport	5095	14	0	100	0	67	67	0	29	21	67	8	61-80
P19	Comprehensive	5086	14	50	50	33	100	100	40	43	42	58	8	41-60
P20	Comprehensive	4541	43	100	67	33	100	100	60	29	54	67	6	41-60
P21	Comprehensive	3483	43	0	33	0	67	33	0	43	33	25	10	NA
P22	Comprehensive	3110	57	50	67	0	100	100	40	14	46	58	5	21-40
P23	Comprehensive	2958	29	50	50	33	67	100	0	29	29	58	6	41-60
P24	Comprehensive	1941	29	50	50	0	67	100	20	29	33	50	5	61-80
P25	Utilities and transport	1440	14	0	83	67	67	33	20	43	29	67	NA	NA
P26	Transport	1399	57	100	67	67	100	100	20	43	54	75	6	41-60
P27	Comprehensive	1150	14	50	33	0	100	100	60	57	50	42	5	21-40
P28	Comprehensive	960	0	50	50	67	67	67	40	43	33	58	6	41-60
P29	Transport	900	14	50	17	0	67	33	40	43	38	17	0	21-40
P30	Comprehensive	886	14	50	33	33	100	33	80	29	46	33	5	81-100
P31	Transport	845	57	100	67	67	100	100	0	43	50	75	7	41-60
P32	Utilities and transport	778	29	100	100	33	67	100	20	43	42	83	9	61-80
P33	Comprehensive	756	14	50	67	0	100	100	80	57	54	58	5	81-100
P34	Urban development	635	0	0	17	0	0	33	20	0	4	17	2	21-40
P35	Comprehensive	621	0	50	100	33	67	100	20	14	21	83	NA	NA
P36	Comprehensive	507	29	50	17	0	67	100	20	29	33	33	3	21-40
P37	Landscape	471	43	50	67	33	67	67	0	43	38	58	6	61-80

CHAPTER 6: SYNTHESIS AND CONCLUSIONS

The main aim of this thesis was to evaluate whether growth-management policies and plans applied by Swiss municipalities have the potential to effectively steer urban development towards compact forms and limit sprawl. In fact, the low-density expansion of urban areas has dramatically influenced the Swiss landscape over the course of the last decades (SFSO, 2015) and has increasingly induced ecological, social, and economic costs (Schwick, Jaeger, Bertiller, & Kienast, 2012). Spatial planning has been blamed for having failed to effectively manage urban growth and protect open landscapes (Muggli, 2014), and recent studies have discussed the application of innovative planning policies to target urban sprawl more efficiently (e.g., Estermann, 2016; Institut für Wirtschaftsstudien Basel, 2016; Menghini, 2013).

This doctoral dissertation focused on planning evaluation and assessed the quality, use and implementation of existing policies, in order to provide systematic data on local growth management. Such information is crucial to help decision-makers identify examples of best practice, improve planning processes and policies, and guide future policy decisions. The thesis was divided into two larger topics. As part of the first topic, a Swiss-wide survey of local planning officers was conducted to evaluate the outputs of the local planning process and investigate which growth-management policies have been applied by Swiss municipalities to steer their urban development since the 1970s. For the purpose of the second topic, roughly 40 municipalities were selected to conduct in-depth analysis of their local plans and improve the understanding of why some municipalities are more likely to adopt growth-management policies and are more successful in their implementation. Complementary to this, questionnaires addressed to local planning officers enabled valuable insight into the outcomes of local plans, by assessing both their performance (i.e., their relevance for guiding daily planning practice) and their conformance (i.e., the implementation of their policies).

In the next sections, the main findings of the thesis are presented and put into perspective in the general context of growth management and planning evaluation. Finally, methodological issues are discussed and some recommendations for further research and for improvements to Swiss planning practices are outlined.

6.1. Main findings

Topic 1: Analysis of growth-management policies (in a sample of 630 municipalities)

6.1.1. First research question: Which growth-management policies do Swiss municipalities use to manage urban growth and to steer their development towards compact urban forms?

The first paper of this thesis (Chapter 3) evaluated whether Swiss municipalities appropriately combine growth-management approaches in order to effectively steer their urban development towards compact urban forms. For this purpose, a questionnaire was developed and addressed to local planning officers to assess the prevalence and the time of introduction of 18 growth-management policies. Subsequent analyses were conducted for a representative sample comprising a range of municipalities, from small to very large, distributed throughout the country since the issue of urban growth affects most municipalities to some degree (see section 2.1.4.).

The study showed that growth-management approaches vary widely between small and large municipalities, with large and very large municipalities using more diversified approaches than their smaller counterparts. In particular, large municipalities were found to supplement traditional land-use regulations (e.g., specification of minimum utilization densities) and conceptual instruments (e.g., local plans) with more innovative land management (e.g., density bonuses) and quality-oriented measures (e.g., programmes for the redevelopment of existing urban areas) implemented through economic incentives and participatory processes. In contrast, small and medium-sized municipalities—which represent about 95% of the country's municipalities—relied mostly on land-use regulations and conceptual instruments. This finding is especially concerning since previous studies have concluded that municipalities should combine several growth-management approaches to manage urban growth efficiently (Bengston, Fletcher, & Nelson, 2004).

However, the study also revealed that the introduction of innovative growth-management approaches by medium-sized and small municipalities has increased dramatically since 2010. This suggests that smaller municipalities have started diversifying their growth-management approaches in the recent past and indicates that local planning practices may evolve towards more effective growth-management approaches in the future.

In addition, the analyses conducted in this thesis confirmed previous results from the USA (e.g., McDonald & McMillen, 2004; O'Connell, 2009; Ramírez De La Cruz, 2009) indicating that population size plays a crucial role in a municipalitie's approach to managing urban development. Larger municipalities were found to have greater planning capacity and to use more growth-management policies than their smaller counterparts.

Topic 2: In-depth analysis of local plans (in a sub-sample of circa 40 Swiss municipalities)

6.1.2. Second research question: What is the influence of cantonal planning mandates on the quality and implementation of local plans (Richtpläne) in the context of sustainable spatial development?

The second paper (Chapter 4) was dedicated to the assessment of the impact of cantonal planning mandates on local plans. In particular this paper aimed to evaluate the influence of planning mandates on local plans and on the implementation of their policies in the context of sustainable spatial development. In addition the analysis provided new insight on the reasons why some cantons make local plans mandatory whilst others rely on voluntary planning. To tackle these different issues, the study built on a multi-method approach combining interviews with cantonal planning officers, content analysis of local plans, and questionnaires addressed to local planning officers.

Overall, the study showed that planning mandates have no influence on the formal quality of local plans and on the implementation of their policies, and that they only have a limited impact on their policy focus. Regarding a plan's formal quality, the analysis revealed that—irrespective of whether plans were mandatory or not—most of them lacked a unifying storyline to inspire and encourage local action, and many of them did not contain clear implementation and monitoring provisions. This last point is especially concerning, since implementation and monitoring provisions are considered crucial to ensure successful plan implementation (Stevens, 2013).

Regarding the reasons prompting cantonal governments to impose planning mandates, interview results led to the conclusion that the decision for or against mandates depends primarily on the geographical, economic and political context and on the balance of power between cantonal and local governments. Interviews revealed that cantonal authorities were generally willing to mandate local plans in order to promote long-term strategic planning. However, they were less likely to impose planning mandates in cantons where municipalities are traditionally granted a high level of planning autonomy, or where regional planning structures are already in place.

6.1.3. Third research question: How can the quality of local plans be assessed within the framework of plan evaluation and how does plan quality influence plan implementation?

Paper III (Chapter 5) aimed to improve the methods for the evaluation of plan quality and implementation to the specificities of local plans. The approach developed in this article is well embedded within existing theoretical concepts and analytical procedures. It distinguishes between the communication- and action-oriented dimensions of plans, which facilitates the evaluation of the quality, performance, and conformance of plans in the context of local planning, providing an innovative and transparent scheme that could easily be applied by planners. Most previous evaluation approaches considered plans as either communication-oriented documents providing a vision to guide long-term development, or as action-oriented blueprints, the provision of which should be strictly respected. However, this distinction is not appropriate for local plans, which present both characteristics. Moreover, little effort has been invested into assessing whether plan quality influences implementation. To tackle these issues, paper III proposes a new framework to evaluate the quality of local plans, and an integrated approach that allows the linking of plan quality to plan implementation. The approach and framework were applied to a set of Swiss local plans. Plan quality was assessed through content analysis, and plan implementation was evaluated through questionnaires addressed to local planning officers.

The analysis empirically confirmed that most Swiss local plans combine communication and action-oriented dimensions. However, it showed that their action-oriented dimension dominated on the whole, as policies and implementation provisions comprised the core elements of plans. Regarding plan implementation, local plans had a relatively high performance (i.e., usefulness of the plans for steering municipal development in day-to-day planning practice) and conformance (i.e., proportion of plan policies likely to be implemented), indicating that local planning officers value the plans and use them in daily planning practice.

In addition, the analysis revealed that the impact of plan quality on implementation differed according to whether it was measured in terms of performance or conformance. Plan quality had an important influence on performance but a less clear influence on conformance.

6.2. Implications of the main findings

6.2.1. Local growth-management policies and plans in Swiss municipalities

Overall, a wide range of growth-management policies already exist in Switzerland, but their application is often constrained by the lack of commitment and the limited planning capacity and professional know-how of local governments. Although some specific new instruments could add to the existing growth-management approaches, the inability of spatial planning to effectively manage urban development does not seem to lie primarily in a shortage of appropriate policies. Instead, it appears to be linked to governance issues related to the high level of institutional fragmentation and the small size of most municipalities.

Municipalities have a vast choice of traditional growth-management approaches (i.e., conceptual instruments and land-use regulations) at their disposal, which they can combine with innovative land-management and quality-oriented measures implemented through economic incentives and participatory processes. However, given the current imbalance in supply and demand for undeveloped building zones and the financial burden that reclassifications (*Rückzonungen*) impose on local governments (Menghini, 2013; Müller-Jentsch & Rühli, 2010), it could be relevant to develop new instruments specifically dedicated to the reallocation of development rights. In this context, transferable development rights (TDR) are of particular interest, because they enable increases in the amount of building zones in central areas, whilst generating money to finance the reduction of undeveloped building zones in peripheral areas at the same time (Institut für Wirtschaftsstudien Basel, 2016; Menghini, 2013).

This mismatch of undeveloped building zones in central and peripheral municipalities illustrates crucial governance issues that impede the efficient management of urban growth at a local scale in Switzerland. Over the past few decades the processes of suburbanisation and urban sprawl have led to rapid growth in former rural municipalities, which are nowadays part of the agglomeration areas of main cities. While these municipalities have experienced a rapid increase in their population and their built-up areas, most of them have remained too small to become equipped with an extended municipal administration, including trained planning staff (Devecchi, 2016). Resultantly a large number of municipalities currently affected by urban growth and urban sprawl do not have the required professional know-how to embrace sustainable urban development and to implement innovative growth-management policies. This issue was highlighted during interviews conducted with cantonal planning officers in paper II (see section 4.4.1., Chapter 4). Interviewees declared that local authorities often lack the financial and in-house planning capacity to precisely tailor their local plans to the needs of their communities, and therefore rely heavily on standardized templates provided by private planning consultants. Sustainable urban development is additionally hindered by the lack of commitment of many local authorities towards compact urban forms, which is especially problematic in Switzerland given the high level of planning autonomy traditionally granted to municipalities (see interviews with cantonal planning officers, section 4.4.1., Chapter 4). In fact, many municipalities actively promote low-density urban development in order to attract new taxpayers.

In two separated studies tackling federalism and local governance in the context of Swiss urban development, Muggli (2014) and Devecchi (2016) confirmed that the institutional fragmentation and the lack of professionalization of many local governments represent key weaknesses of spatial planning in Switzerland. Consequently many small and medium-sized municipalities are overwhelmed by the complexity of current planning challenges, which severely limits their ability to steer urban development towards compact urban forms and to encourage infill growth (VLP-ASPAN, 2015).

In light of these conclusions, it appears crucial to increase the planning capacity and the professionalization of small and medium-sized municipalities in order to strengthen local planning. However, in view of the powerful economic forces at work in the context of land development, it seems doubtful that measures dedicated to increasing planning capacity and professionalization in spatial planning will suffice to manage urban growth and limit urban sprawl efficiently (Muggli, 2014). To support economical land-use, it is most likely also necessary to promote institutional reforms—such as municipal mergers—and economic interventions aimed at internalizing the costs of urban sprawl and correcting the incentives leading to more land consumption (see section 2.2. for further details about examples of institutional reforms and economic interventions).

6.2.2. Relevance of planning evaluation and advantages of using an integrated approach towards assessing plan quality and implementation

Ex post evaluation proved very helpful to assess the strengths and weaknesses of Swiss local planning, since it allowed the study of the use and quality of past and existing growth-management policies and plans to inform future policy decisions related to growth management. For example, the conclusion that local plans often lack clear implementation and monitoring provisions—irrespective of whether the plans are mandated or not—led to the formulation of precise recommendations to cantonal authorities regarding the provisions set out in planning mandates. In particular suggestions that planning mandates should contain precise requirements, such as the obligation to assemble policies into exhaustive action plans (section 4.5.3., Chapter 4). Overall, such ex post evaluations are invaluable to avoid what Calkins (1979) referred to as the "new plan syndrome", where new plans and policies are adopted without understanding why previous planning efforts have failed at steering urban development as expected.

Regarding local plans, the analyses conducted in the context of this doctoral thesis (Chapter 5) have demonstrated that an integrated evaluation approach combining performance and conformance is well adapted to account for the complex nature of this instrument, confirming other recent research efforts in the field of planning evaluation (Guyadeen & Seasons, 2016). Local plans are expected to meet numerous expectations, since they often serve both as a vision to guide the long-term development of municipalities, and as a detailed action plan to steer local development towards achieving this vision (Norton, 2008; Randolph, 2004). In Switzerland, local planning officers reported considering their local plans as a key instrument of spatial development, since it represents a useful guideline in the face of changing local conditions, such as political turnovers (C. Perregaux DuPasquier, vice-director of the VLP-ASPAN, personal communication, October 30, 2015). In this context, evaluation approaches based solely on performance or conformance criteria would overlook important aspects related to the quality and the implementation of local plans.

In addition, the framework developed in this dissertation to assess the quality of local plans based on their communication- and implementation-oriented dimensions (Paper III, Chapter 5) could help planners evaluate the quality of the plans they produce. Consequently this framework could contribute towards the development of plan evaluation in planning practice. In fact, planning scholars have reported that plan evaluation is rarely performed in practice, which limits the improvement of plan-making processes (Carmona & Sieh, 2004; Guyadeen & Seasons, 2016). Among the factors which impede practical plan evaluation, scholars have noted the future-oriented nature of planning activities, which implies that professional planners are more rewarded for developing new plans than for evaluating past interventions (Laurian et al., 2010). However, they have also observed that: "most evaluation methodologies rely on a technical sophistication and an advanced scientific knowledge" (Oliveira & Pinho, 2010, p. 349), which may overwhelm planning practitioners. The approach developed in this doctoral thesis bridges this gap between planning theory and practice, by proposing a transparent scheme that is well embedded within existing theoretical concepts and analytical procedures, yet could easily be applied by planners.

6.3. Methodological aspects and future research directions

A few methodological issues warrant discussion in order to guide future research efforts. Throughout the thesis ex post evaluation was used to study:

> (1) The outputs of the local planning process, assessed by the use and the quality of growth-management policies and plans (Papers I, II, and III, Chapters 3, 4, and 5)
>
> (2) The outcome of the local planning process, assessed by the implementation of local plans (Papers II and III, Chapters 4 and 5).

Planning success was evaluated both in terms of performance and conformance. However, conformance was exclusively measured according to the proportion of policies implemented or likely to be implemented before the end of the plan's lifespans. However, whether growth-management policies and plans had a direct influence on urban development and land-use patterns (e.g. on building densities, or on the amount of built-up areas) was not assessed. This aspect of conformance should be accounted for in future studies, because it represents an important facet of planning success (e.g., Guyadeen & Seasons, 2016; Oliveira & Pinho, 2010, see Chapter 2.4.2. for further details).

In the present dissertation, the direct impacts of policies and plans on urban development and land-use patterns (e.g., the expansion of urban areas, and increased building densities) were not tackled. However, the large amount of new data collected in the context of this thesis (namely data on the prevalence and timing of introduction of local growth-management policies, and the quality and implementation of local plans) provides a solid basis for conducting further studies. For example, GIS analyses could be used to evaluate whether municipalities combining land-use regulations with economic incentives are more successful at increasing building densities or reducing the expansion rate of their built-up areas. To obtain meaningful results however, future study designs should account for (1) the multicausality issue and (2) the time lag between the

implementation of policies and their tangible impact on urban development.

More generally, future studies on local growth-management should investigate how policies can be better adapted to the challenges faced by small and medium-sized municipalities. The inadequacy of current policy responses to the needs of smaller municipalities has been documented in numerous regions including the United States (Edwards & Haines, 2007), Europe (Wandl, Nadin, Zonneveld, & Rooij, 2014), and Switzerland (Devecchi, 2016). In this context, a study by Buschk and colleagues (Busck, Hidding, Kristensen, Persson, & Præstholm, 2008), who compared planning approaches specifically dedicated to "rurban" areas in Denmark, Sweden and the Netherlands could serve as a starting point for further investigations.

6.4. Practical implications

This doctoral dissertation has focused on planning evaluation to assess the quality and the use of growth-management policies and plans in Switzerland. During the study, it became clear that the lack of planning capacity in small and medium-sized municipalities is a major impediment to sustainable urban development. The analyses also revealed that some policies and plans could be enhanced and strengthened in order to better target urban growth. Therefore, a few practical recommendations addressed to planning practitioners and decision-makers are summarized in the next paragraphs.

Overall, across all institutional levels (federal, cantonal and local); it appears crucial to increase planning capacity and expert knowledge relating to sustainable urban development. To this purpose, regional coordination efforts (e.g., *Agglomerationsprogramme*) and territorial reforms which aim to reduce the institutional fragmentation at municipal level should be actively supported. In particular, municipal mergers should be encouraged because they lead to economies of scale, which allow the professionalization of the administrative and executive planning functions. It would also be advisable to provide municipal authorities with accessible and affordable counselling opportunities, like those already proposed by the Swiss Spatial Planning Association VLP-ASPAN. Such counselling organizations can greatly support compact urban development by guiding municipal authorities during the selection and the implementation of growth-management policies. In parallel, cantonal and local decision-makers could benefit from new visualization and spatial decision support tools, which foster participative planning processes and help investigating the possible impacts of policy decisions and strategies (see Hayek, von Wirth, Neuenschwander, & Grêt-Regamey, 2016; Drobnik, Huber, & Grêt-Regamey, 2016). For example, Grêt-Regamey and colleagues (Grêt-Regamey, Altwegg, Sirén, van Strien, & Weibel, in press) tested in the region of Thun an innovative tool (PALM) aimed at supporting the allocation of new urban development areas. Their study revealed that PALM could raise the awareness of local authorities and stakeholders for the ecological and social value of open landscapes. Consequently, it could encourage decision-makers to allocate new building zones in existing urban areas rather than at their peripheries, thereby securing the valuable soils located around existent settlement areas for ecological, agricultural and recreational functions.

At cantonal scale and specifically in relation to planning mandates for local plans, the analyses conducted in this thesis revealed that cantonal governments could set clearer goals and more specific requirements regarding the content of local plans, irrespective of whether they mandate or only enable them. Additionally, cantonal governments could assess the quality of the plans developed by municipalities in their jurisdiction by using the framework developed in Paper III (Chapter 5), in order to guide municipalities towards enhancing low-quality plans and provide them with examples of best-practice.

Finally at municipal level, local governments should be encouraged to diversify their growth-management approaches. More specifically, they should supplement traditional land-use regulations and conceptual instruments with more innovative land-management and quality-oriented measures implemented through economic incentives and participatory processes. Furthermore, it is highly recommended that municipalities develop a local plan or any other kind of long-term strategic planning instrument (e.g., *Masterplan, Siedlungsleitbild, Siedlungsentwicklungskonzept*) and to invest in their preparation. In fact, literature evaluating plan quality repeatedly shows that such instruments have the potential to act as flexible guidelines in the face of current spatial planning challenges if municipal governments carefully target them towards the needs of their communities. In particular, local plans should clearly detail: (1) the needs and resources of the municipalities, (2) the decisions and alternatives discussed or agreed upon during the planning process, (3) the long-term development objectives of the municipalities, and (4) specific implementation and monitoring provisions to attain the stated objectives. Under these conditions, local plans can help identify, coordinate and solve potential conflicts of interest related to land-use planning, and may therefore contribute to steering local urban development towards more compact urban forms. Moreover, local plans are pertinent instruments to coordinate planning issues across municipal borders and steer urban development over larger regions (e.g., *funktionale Räume, Agglomerationen*).

Local plans usually have an expected lifespan of approximately 10-15 years, and many currently implemented plans will undergo thorough revisions over the next few years. The findings of this thesis and the resulting practical recommendations represent valuable guidelines to steer the revision of these instruments, and encourage the development of local plans that are well targeted to the specific needs of local communities and contain detailed implementation provisions.

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APPENDIX A: DÉVELOPPER L'URBANISATION VERS L'INTÉRIEUR: TOUR D'HORIZON DES INSTRUMENTS COMMUNAUX ET DE LEUR UTILISATION

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Abstract: Au cours des dernières décennies, les collectivités publiques ont adopté de nombreuses mesures de plani cation territoriale a n de diriger leur urbanisation vers l'intérieur. Une enquête conduite en 2014 auprès des communes du pays a permis d'obtenir une vue d'ensemble de ces mesures. Cet article se fonde sur les résul- tats de l'enquête et présente l'utilisation de quatre mesures de plani cation. Il démontre que leur adoption varie fortement d'un canton à l'autre, mais dépend également de facteurs contextuels. Les résultats indiquent que les communes dis- posent d'outils appropriés pour gérer leur développement urbain de manière ef - cace. Cependant, d'importants efforts restent à entreprendre pour les convaincre de les utiliser de manière plus conséquente.

Forum für Wissen 2015: 69–77

Développer l'urbanisation vers l'intérieur: Tour d'horizon des instruments communaux et de leur utilisation

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Au cours des dernières décennies, les collectivités publiques ont adopté de nombreuses mesures de planification territoriale afin de diriger leur urbanisation vers l'intérieur. Une enquête conduite en 2014 auprès des communes du pays a permis d'obtenir une vue d'ensemble de ces mesures. Cet article se fonde sur les résultats de l'enquête et présente l'utilisation de quatre mesures de planification. Il démontre que leur adoption varie fortement d'un canton à l'autre, mais dépend également de facteurs contextuels. Les résultats indiquent que les communes disposent d'outils appropriés pour gérer leur développement urbain de manière efficace. Cependant, d'importants efforts restent à entreprendre pour les convaincre de les utiliser de manière plus conséquente.

1 L'urbanisation vers l'intérieur: un défi pour la planification communale

En Suisse, les zones urbaines ne cessent de s'étendre au détriment des terres agricoles et autres surfaces ouvertes. Selon l'OFS, les surfaces d'habitat et d'infrastructure ont ainsi augmenté de 23 % entre 1985 et 2009 (OFS 2015a). Cette tendance entraîne non seulement des répercussions négatives sur la biodiversité, les espaces récréatifs de proximité et l'esthétique des paysages, mais elle impose aussi d'importants coûts économiques (Schwick *et al.* 2012). Ces dernières années, plusieurs questions liées à l'urbanisation ont été largement débattues par la population, les médias et la classe politique. L'acceptation par le peuple de l'initiative sur les résidences secondaires en 2012, ainsi que les discussions qui entourent la révision de la loi fédérale sur l'aménagement du territoire (LAT) démontrent que la gestion du développement urbain représente un enjeu majeur. En effet, la pression urbaine ne se fait pas uniquement ressentir dans les principales agglomérations du pays, mais s'exerce également dans les zones rurales ou touristiques (Jaeger et Schwick 2014).

Afin de limiter l'étalement urbain, la Confédération a fait de l'urbanisation vers l'intérieur l'un de ses principaux objectifs en matière de développement territorial (ARE 2009). Cette forme de développement vise à restreindre la création de nouvelles zones urbaines, à densifier les surfaces bâties déjà existantes et à améliorer la qualité des espaces urbains. Bien que les cantons soient en charge de la réalisation pratique de l'aménagement du territoire en Suisse, ceux-ci délèguent généralement aux communes la planification concrète au niveau local. Au cours des dernières décennies, les communes suisses ont ainsi adopté de nombreuses mesures afin de diriger leur développement urbain vers l'intérieur. Pour elles, la planification urbaine représente cependant une charge administrative importante et pose des défis aux autorités. En effet, 61 % des communes suisses comptent moins de 2000 habitants (OFS 2015b) et leur administration est trop petite pour employer des techniciens spécialisés en urbanisme. De plus, les finances communales reposant en grande partie sur les recettes fiscales, de nombreuses communes cherchent à attirer de nouveaux contribuables en encourageant la croissance urbaine. Dans ce contexte, l'urbanisation vers l'intérieur ne représente pas une priorité pour de nombreuses collectivités publiques. Au contraire, nombre d'entre elles soutiennent activement la poursuite d'une forte croissance.

Malgré l'attention soutenue portée aux conséquences de l'urbanisation, il existe peu d'informations sur les mesures mises en place par les communes afin de gérer le développement de leur espace urbain de manière plus durable. Une enquête conduite en 2014 auprès des communes suisses (Berli *et al.* 2014) permet d'y remédier en apportant de nouvelles données sur les mesures concrètes appliquées par elles. Le présent article se fonde sur cette étude et présente quatre de ces mesures en détail. Il vise à répondre aux questions suivantes:

- Quelle est la fréquence d'utilisation des quatre mesures de planification sélectionnées?
- De quelle manière leur fréquence d'utilisation varie-t-elle en fonction de l'appartenance cantonale, de la taille des communes et de leur caractère urbain?
- Depuis quand les différentes mesures sont-elles appliquées?

2 Enquête auprès des communes

2.1 Thèmes abordés

L'enquête intitulée «Organisation et instruments de l'aménagement du territoire au niveau communal. Une enquête empirique auprès des communes suisses» (Berli *et al.* 2014) s'est déroulée de février à juin 2014. Elle portait sur quatre aspects de l'aménagement du territoire communal. La première partie concernait la révision de la LAT et évaluait les préoccupations des communes en vue de l'entrée en vigueur de la loi révisée. La deuxième partie explorait l'organisation de l'aménagement du territoire. La troi-

sième section portait sur les mesures mises en place pour diriger le développement urbain vers l'intérieur. Une sélection de vingt mesures de planification était proposée aux communes, qui devaient indiquer si elles les avaient adoptées. Les réponses possibles étaient «oui», «non», et «ne sais pas». Les mesures considérées pouvaient être soit des instruments de planification à part entière (p. ex. plan directeur communal, conception directrice communale), soit des prescriptions inscrites dans un instrument de planification (p. ex. définition d'indices d'utilisation du sol minimaux dans le règlement sur les constructions, modification de l'affectation d'une zone à bâtir dans le plan général d'affectation), soit des mesures complémentaires mises en œuvre par d'autres mécanismes (p. ex. évaluation du potentiel de densification du milieu bâti, programme d'encouragement à la rénovation des centres anciens). Finalement, la quatrième section visait à déterminer dans quelle mesure les communes suisses collaborent les unes avec les autres en matière d'aménagement du territoire, et pour quelles raisons. Pour chaque thème abordé, une attention toute particulière a été apportée à l'aspect temporel. Par exemple, les communes qui déclaraient disposer d'une mesure de planification spécifique étaient invitées à préciser depuis quand celle-ci était utilisée. Ce faisant, le but était d'obtenir des informations sur l'évolution de la planification territoriale communale au cours des dernières décennies.

2.2 Déroulement de l'enquête

L'enquête a été adressée sous forme de questionnaire à toutes les communes suisses qui existaient au 1.1.2014. Exception faite cependant de celles du canton de Genève qui disposent de peu d'autonomie en matière d'aménagement local, les plans généraux d'affectation étant élaborés directement par le canton. Afin qu'une bonne compréhension soit garantie, les questions ont été formulées en allemand, en français et en italien, et un glossaire a été établi dans chaque langue. En effet, la structure fédéraliste de l'aménagement du territoire en Suisse implique qu'une même mesure de planification peut porter des noms variables d'un canton à l'autre. Dans le glossaire, chaque terme technique était défini précisément et accompagné d'une liste de synonymes employés dans différentes régions de Suisse.

3 Taux de réponse et représentativité de l'échantillon

La Suisse comptait 2352 communes au 1.1.2014, et environ 70 % d'entre elles ont retourné le questionnaire complété. Cet article se fonde sur les résultats obtenus en analysant les réponses de cet échantillon. Le taux de participation a varié légèrement d'un canton à l'autre, mais a dépassé 50 % dans tous les cas (Fig. 1).

Afin que soit vérifiée la représentativité de l'échantillon, la répartition des communes a été comparée à celle de l'ensemble des communes du pays. Cette comparaison a été effectuée pour trois caractéristiques qui influencent les questions liées à l'aménagement du territoire: l'appartenance cantonale, la taille de la population et le caractère urbain. La figure 2 démontre que l'échantillon représente fidèlement la répartition des communes suisses en ce qui concerne leur appartenance cantonale, à l'exception du canton de Genève exclu de l'enquête. Les cantons de Zurich, Saint-Gall et Fribourg sont légèrement surreprésentés, alors que les cantons du Tessin et des Grisons sont quelque peu sous-représentés.

La répartition des communes par classe de population (Fig. 3) montre que l'échantillon compte très légèrement plus de communes entre 1000 et 20000 habitants que dans l'ensemble de la Suisse, alors que celles de moins de 1000 habitants sont faiblement sous-représentées.

Finalement, la distribution par classe de caractère urbain repose sur la nouvelle définition de l'espace à caractère urbain 2012 développée par l'Office fédéral de la statistique (OFS 2014). La répartition des communes dans l'échantillon ne montre pas de déviation importante par rapport à celle de l'ensemble du pays (Fig. 4). Les communes-centres sont seulement très légèrement surreprésentées, alors que celles de couronne d'agglomération ou multi-orientées sont faiblement sous-représentées.

En conclusion, l'échantillon est suffisamment représentatif pour permettre

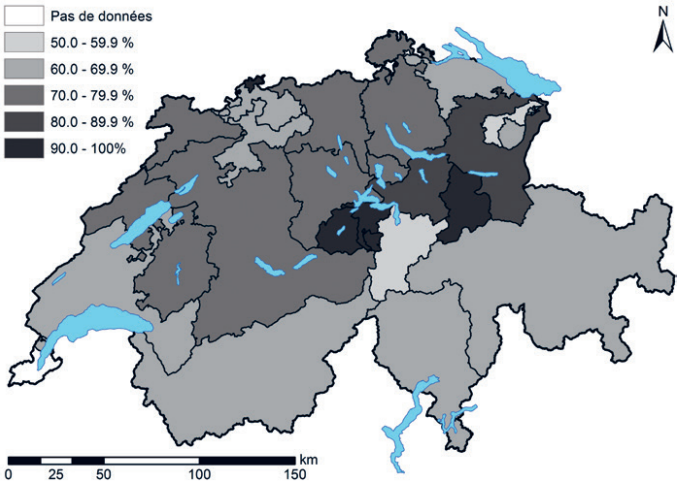

Fig. 1. Taux de participation à l'enquête sur l'aménagement du territoire, par canton. Le canton de Genève a un taux de participation nul car il a été exclu de l'enquête.

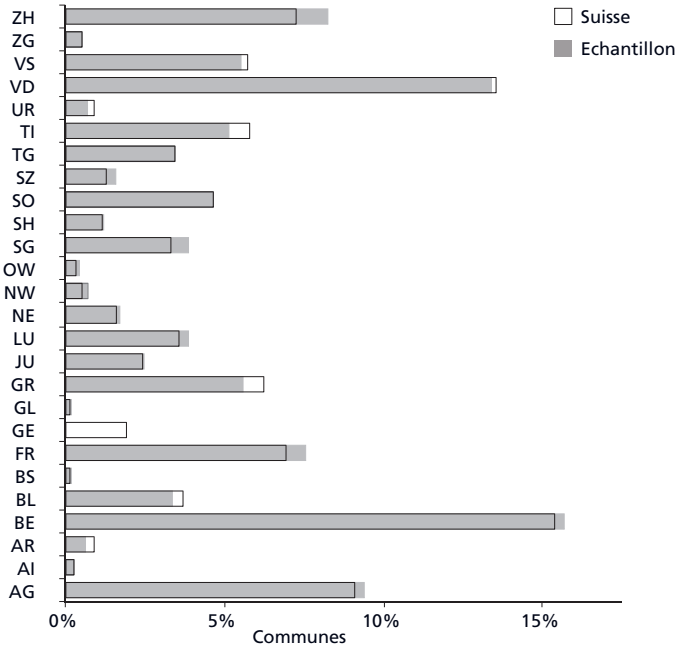

Fig. 2. Proportion de communes par canton, en Suisse (blanc) et dans l'échantillon (gris).

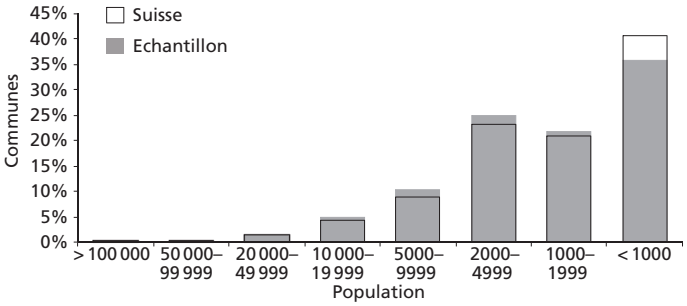

Fig. 3. Proportion de communes par classe de population, en Suisse (blanc) et dans l'échantillon (gris).

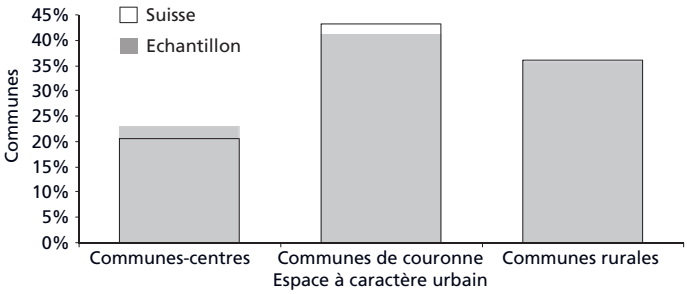

Fig. 4. Proportion de communes par classe de caractère urbain, en Suisse (blanc) et dans l'échantillon (gris).

d'en tirer des informations valides sur l'organisation et les instruments de l'aménagement du territoire dans l'ensemble des communes suisses.

4 Favoriser l'urbanisation vers l'intérieur: exemples de mesures de planification communales

Les vingt mesures de planification considérées dans l'enquête peuvent être classées en quatre groupes en fonction de leurs objectifs et de leurs mécanismes de mise en œuvre (Tabl. 1):

- Mesures de planification stratégique
- Mesures d'affectation
- Mesures de politique foncière active
- Mesures visant à améliorer la qualité des espaces urbains

Les mesures de planification stratégique permettent d'obtenir une vision d'ensemble du développement urbain de la commune, décrivent ses objectifs d'évolution et expliquent comment ils devront être atteints. Ces mesures sont peu détaillées et ne définissent pas l'utilisation du sol au niveau des propriétés individuelles. En revanche, les mesures d'affectation définissent précisément l'occupation du sol tolérée sur chaque parcelle. Ces mesures sont inscrites dans les plans d'affectation, les plans d'affectation spéciaux et les règlements communaux sur les constructions. Les mesures de politique foncière active ont pour objectif d'assurer la gestion rationnelle et la disponibilité du patrimoine foncier. Aussi, elles visent à redistribuer les bénéfices qui résultent des procédures d'aménagement territorial. Finalement, les mesures visant à améliorer la qualité des espaces urbains sont développées pour revaloriser le milieu construit et atténuer les craintes liées à la densification du bâti.

Le présent article est trop succinct pour détailler les vingt mesures étudiées. À la place, une sélection de quatre mesures est présentée de manière approfondie dans les sections suivantes.

Tabl. 1. Liste des 20 mesures de planification communale incluses dans l'enquête. Elles sont classées en 4 groupes selon leurs objectifs et leurs mécanismes de mise en œuvre.

Planification stratégique	– Conception directrice communale – Plan directeur communal – Masterplan – Evaluation du potentiel de densification – Volonté politique de restreindre l'extension des zones d'habitation à faible densité – Volonté politique de limiter le classement de nouveaux terrains en zone à bâtir
Affectation	– Indices d'utilisation du sol minimaux – Rehaussement des indices d'utilisation du sol – Changement d'affectation d'une zone à bâtir afin d'augmenter sa densité de construction – Augmentation de l'indice d'utilisation du sol pour les zones à bâtir bien raccordées au réseau de transports publics – Plans d'affectation spéciaux qui imposent des densités d'utilisation plus élevées – Plans d'affectation spéciaux qui règlent la planification du milieu bâti par étape afin de garantir une utilisation rationnelle du sol – Déclassement de zones à bâtir – Définition de zones à maintenir libres de toute construction dans le but de limiter l'extension du milieu bâti
Politique foncière active	– Remaniements parcellaires – Mesures contre la thésaurisation des terrains à bâtir – Achat de terrains à des propriétaires fonciers privés afin de constituer un patrimoine foncier communal – Système de prélèvement de la plus-value résultant d'une mesure de planification
Amélioration de la qualité des espaces urbains	– Programme d'incitation à la rénovation et à l'amélioration de la structure du milieu bâti déjà existant – Programme d'amélioration de la qualité urbanistique des nouveaux projets de construction dans les zones à bâtir à forte densité

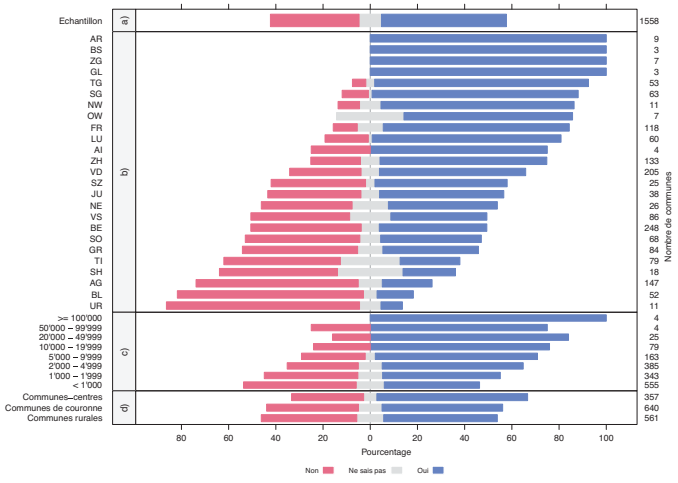

Fig. 5. Fréquence d'utilisation du plan directeur communal dans l'échantillon (a), et en fonction de l'appartenance cantonale (b), de la taille de la commune (c), et de la classe de caractère urbain (d).

4.1 Planification stratégique: le plan directeur communal

Le plan directeur communal comprend généralement une carte et un texte. Il décrit les objectifs de développement territorial de la commune et précise comment elle prévoit de les coordonner et de les atteindre. Son contenu touche à différents domaines à incidence spatiale comme par exemple l'urbanisation, la protection du paysage ou les transports (VLP-ASPAN 2013a). Les plans directeurs communaux servent également à informer la population locale et les communes voisines des perspectives d'évolution futures. Ils peuvent aider à identifier suffisamment tôt d'éventuels conflits d'intérêts, ce qui facilite l'établissement des plans d'affectation.

Le plan directeur communal est un instrument très répandu, puisque plus de la moitié des communes (53 %) ont indiqué l'avoir adopté (Fig. 5). Sa fréquence d'utilisation varie cependant fortement d'un canton à l'autre. Il est utilisé par plus de 70 % des communes dans de nombreux cantons de Suisse centrale (ZG, NW, OW, LU) et orientale (GL, TG, SG, AR) ainsi que dans les cantons de Bâle-Ville, Fribourg et Zurich. Par contre, il est peu répandu dans les cantons du Tessin, de Schaffhouse, d'Argovie, de Bâle-Campagne et d'Uri.

Ces différences importantes s'expliquent par le caractère obligatoire du plan directeur communal dans certains cantons. Par exemple, cet instrument fait partie intégrante de la planification communale dans les cantons d'Appenzell Rhodes-Extérieures, Glaris et Fribourg. Le canton de Vaud quant à lui prévoit que toutes les communes de plus de 1000 habitants doivent développer un plan directeur. A l'inverse, de nombreux autres cantons (p. ex. Neuchâtel ou l'Argovie) n'imposent pas à leurs communes d'établir ce type de plan.

Les grandes communes et les communes-centres adoptent plus souvent un plan directeur que les communes de petite taille, de couronne d'agglomération ou à caractère rural. En effet, 84 % des communes entre 20000 et 50000 habitants ont indiqué posséder un plan directeur, alors que ce chiffre tombe à 40% pour les communes de moins de

1000 habitants. Aussi, environ 64 % des communes-centres ont un plan directeur, tandis que seule la moitié des communes de couronne d'agglomération ou à caractère rural font de même.

En Suisse, le plan directeur communal est bien ancré dans la pratique et il a régulièrement gagné en popularité au cours des dernières décennies (Fig. 6). La majorité des communes qui possèdent un plan directeur l'ont adopté dès les années 1990 (22 %) ou 2000 (31 %). Cependant, l'apparition de cet instrument est plus ancienne, puisque 7 % des communes concernées ont déclaré l'avoir déjà développé dans les années 1970. La période d'adoption varie peu en fonction de la taille de la commune ou du caractère urbain. Par contre, d'importantes variations cantonales apparaissent. Parmi les cantons où le plan directeur est très répandu, Zoug et Zurich se distinguent puisqu'une grande proportion de leurs communes ont développé un plan directeur avant le début des années 1990. Dans la majorité des autres cantons, la généralisation du plan directeur s'est faite plus récemment.

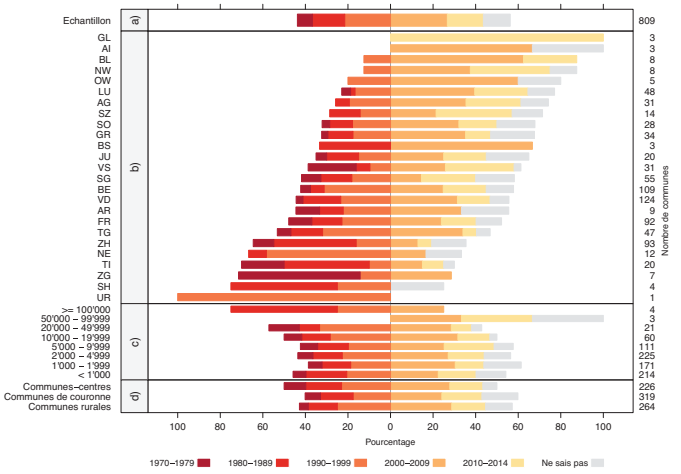

Fig. 6. Période à partir de laquelle le plan directeur communal a été adopté dans l'échantillon (a), et en fonction de l'appartenance cantonale (b), de la taille de la commune (c), et de la classe de caractère urbain (d). L'échantillon comprend toutes les communes qui ont déclaré posséder un plan directeur communal.

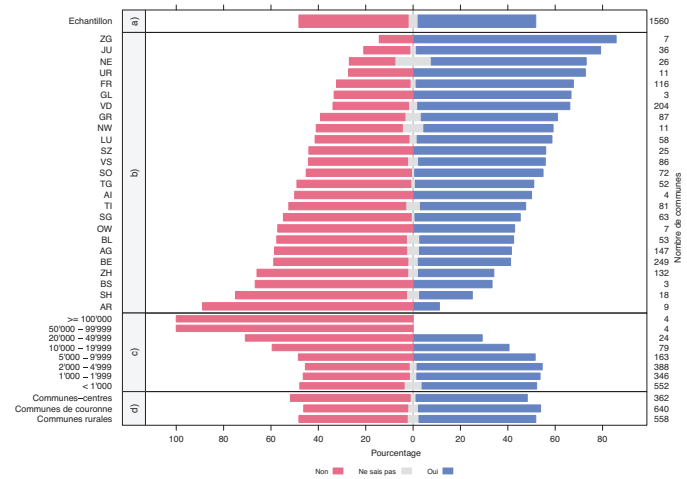

Fig. 7. Fréquence d'utilisation de l'indice d'utilisation du sol minimal dans l'échantillon (a), et en fonction de l'appartenance cantonale (b), de la taille de la commune (c), et de la classe de caractère urbain (d).

4.2 Affectation: l'indice d'utilisation du sol minimal

Les communes sont tenues de définir le degré d'utilisation des terrains pour chaque type de zone à bâtir. Ces prescriptions sont inscrites dans le règlement communal et sont généralement mesurées par l'indice d'utilisation du sol. Dans la plupart des cas, les communes déterminent des indices d'utilisation du sol maximaux afin d'empêcher la construction de bâtiments trop volumineux. Dans une perspective d'urbanisation vers l'intérieur, il est au contraire judicieux de relever les indices d'utilisation du sol maximaux, de les supprimer, ou encore de spécifier des indices minimaux. Ceci permet d'encourager la densification et l'utilisation rationnelle des zones à bâtir en empêchant qu'elles soient sous-utilisées. Avec son nouveau plan directeur cantonal, le canton de Vaud oblige ses communes à fixer un indice d'utilisation minimal pour toute nouvelle zone à bâtir. Le canton de Zurich prévoit également dans sa loi sur les constructions que les communes doivent définir des indices d'utilisation minimaux (Article 49a de la Loi cantonale sur l'aménagement du territoire et les constructions PBG). D'autres cantons, à l'image de ceux de Soleure et de Lucerne, n'obligent pas leurs communes à fixer des indices d'utilisation du sol minimaux mais leur en donnent la possibilité.

La spécification d'indices d'utilisation du sol minimaux est très répandue, puisque 50 % des communes interrogées ont indiqué en faire usage (Fig. 7). Cette mesure se rencontre dans plus de 70 % des communes dans les cantons de Zoug, du Jura, de Neuchâtel et d'Uri. À contrario, elle est présente dans moins de 25 % des communes des cantons de Schaffhouse et d'Appenzell Rhodes-Extérieures. La taille des communes semble jouer un rôle important dans l'adoption de cette mesure.

Si 50 % des communes de moins de 10000 habitants l'utilisent, ce chiffre diminue fortement pour les communes de 10000 à 50000 habitants. Quant aux villes plus peuplées, elles semblent complètement renoncer à fixer des indices minimaux. Une possible explication à ce phénomène est liée au prix des terrains à bâtir. Dans les grandes villes, ils ont tendance à être plus élevés que dans la majorité des petites communes périphériques. Les promoteurs immobiliers et les propriétaires fonciers ont alors intérêt à densifier leurs parcelles afin d'en tirer le maximum de profit. Dans de tels cas, la spécification d'indices d'utilisation du sol minimaux est superflue car le marché régule de lui-même la densification du bâti. Le caractère urbain des communes semble quant à lui avoir moins d'influence sur l'utilisation des indices minimaux. Les communes de couronne d'agglomération les adoptent un peu plus fréquemment que les communes-centres et les communes rurales.

Environ la moitié des communes qui possèdent des indices d'utilisation du sol minimaux les ont adoptés avant le début des années 1990 (Fig. 8). Cette mesure est donc relativement ancienne. Cependant, elle a continué à être mise en place par de nombreuses autres communes au cours des dernières décennies. La plupart des cantons comptent une large proportion de communes qui ont adopté des indices d'utilisation du sol minimaux avant les années 1990. Par contre, les cantons d'Obwald, du Jura, de Berne, Neuchâtel et Uri ont commencé à faire usage de cette mesure de planification plus récemment. La taille des communes et le caractère urbain semblent n'avoir qu'une faible influence sur l'époque à laquelle les indices d'utilisation minimaux ont été introduits.

4.3 Politique foncière active: l'achat de terrains à des propriétaires fonciers privés

Par l'achat de terrains à des propriétaires privés, les communes ont la possibilité de constituer un patrimoine foncier communal. En faisant valoir leurs droits de propriété, elles peuvent ainsi influencer le développement urbain de manière directe. Le fait de posséder des terrains judicieusement situés les aide à assumer leurs responsabilités publiques (p. ex. en construisant des logements à loyers modérés). Elles peuvent également échanger leurs parcelles avec des propriétaires qui thésaurisent leurs terrains à bâtir (VLP-ASPAN 2013b). De même, les communes peuvent intervenir directement dans les projets de développement qui concernent leurs parcelles ou celles de leurs voisins en faisant valoir leurs statuts de propriétaires fonciers. Finalement, la possession de terrains leur ouvre la possibilité de céder des parcelles en droit de superficie (Guerrieri 2011). Ce faisant, elles donnent l'autorisation à des privés d'utiliser leurs terrains tout en restant propriétaires. Par de telles démarches, elles peuvent exiger des promoteurs qu'ils respectent des critères de développement urbain durable, comme par exemple une qualité urbaine élevée, une forte densité ou la création d'infrastructures publiques. Bien entendu, l'achat de terrains est très coûteux et il est souvent impossible pour les communes de constituer un large patrimoine foncier. Pour cette raison, il est judicieux de se concentrer sur l'achat de quelques parcelles stratégiques qui permettent d'avoir un impact significatif sur le développement urbain.

L'achat de terrains à des propriétaires privés est peu répandu en Suisse, puisque seules 16 % des communes interrogées ont indiqué recourir à cette mesure (Fig. 9). Les cantons du Jura et d'Appenzell Rhodes-Intérieures font exception, car plus de 50 % de leurs communes l'utilisent. Les communes de plus de 20000 habitants semblent y recourir plus souvent que leurs homologues de petite taille. Aussi, les communes de couronne d'agglomération appliquent cette mesure moins souvent que les communes-centres et les communes rurales.

L'achat de terrains à des particuliers est une démarche plutôt récente, puisque 61 % des communes ont indiqué l'entreprendre depuis les années 2000 seulement (Fig. 10). Depuis 2010, cette mesure a cependant connu un fort engouement, dans la plupart des cantons et indépendamment de la taille des communes ou de leur caractère urbain.

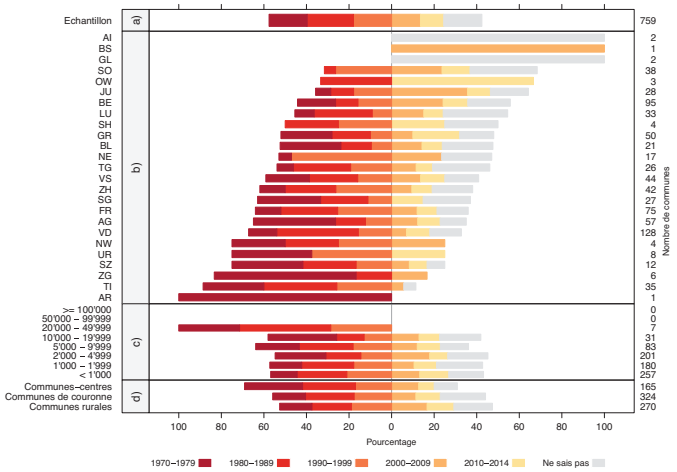

Fig. 8. Période à partir de laquelle des indices d'utilisation du sol minimaux ont été adoptés dans l'échantillon (a), et en fonction de l'appartenance cantonale (b), de la taille de la commune (c), et de la classe de caractère urbain (d). L'échantillon comprend toutes les communes qui ont déclaré appliquer des indices d'utilisation du sol minimaux.

4.4 Qualité des espaces urbains: l'incitation à la rénovation

Les programmes d'incitation à la rénovation peuvent avoir pour but de revitaliser et restaurer les centres histo-

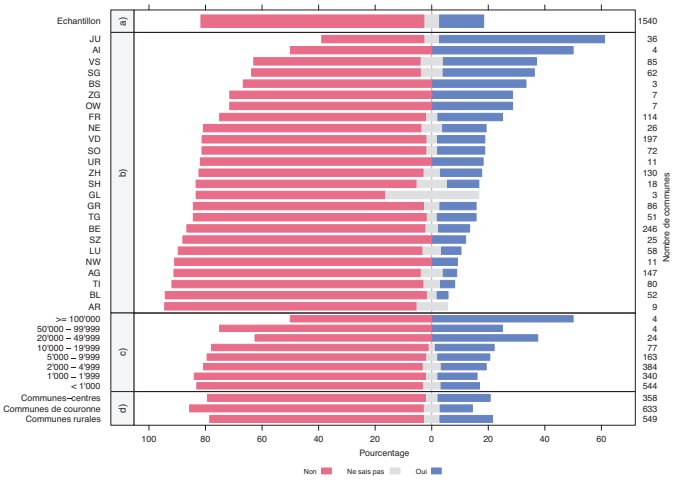

Fig. 9. Fréquence d'utilisation de l'achat de terrains dans l'échantillon (a), et en fonction de l'appartenance cantonale (b), de la taille de la commune (c), et de la classe de caractère urbain (d).

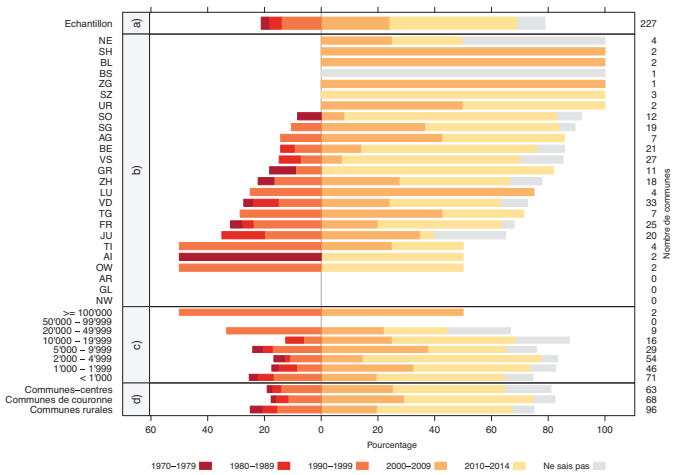

Fig. 10. Période à partir de laquelle l'achat de terrains a été utilisé dans l'échantillon (a), et en fonction de l'appartenance cantonale (b), de la taille de la commune (c), et de la classe de caractère urbain (d). L'échantillon comprend toutes les communes qui ont déclaré acheter des terrains à des propriétaires privés.

riques anciens ou de rénover et assainir des ensembles de bâtiments résidentiels construits durant le XX^{e} siècle. Parfois, ils visent également à augmenter la qualité du milieu non bâti en y créant de nouveaux espaces verts ou des zones de rencontre. Ce type d'interventions permet de lutter contre le dépeuplement des centres anciens en y adaptant les logements aux conditions de vie actuelles et en augmentant l'attractivité des zones urbaines déjà existantes. De telles stratégies s'insèrent dans le processus d'urbanisation vers l'intérieur puisqu'elles encouragent la population à résider dans les centres urbains. Les mesures visant à inciter à la rénovation du milieu bâti sont variées et peu institutionnalisées. Dans certains cantons tels que Berne et Zurich, des dispositions légales existent pour faire pression sur les propriétaires qui refusent les projets de rénovation. Cependant, ces moyens sont très rarement appliqués (VLP-ASPAN 2013b). Dans de nombreux cas, les communes mettent plutôt en place des programmes d'incitation en octroyant des subsides aux propriétaires qui souhaitent rénover leur parc immobilier, à la condition qu'ils respectent des critères de qualité stricts. Alternativement, les communes peuvent également créer d'autres types d'incitation en modifiant les plans d'affectation ou en établissant des plans d'affectation spéciaux. Par exemple, elles peuvent prévoir une augmentation du coefficient d'utilisation du sol en échange de la réalisation de projets de rénovation (ARE 2013).

Environ une commune sur quatre applique des mesures d'incitation à la rénovation et à l'amélioration structurelle du milieu bâti (Fig. 11). Ce type de mesures est particulièrement répandu dans les cantons de Bâle-Ville, d'Appenzell Rhodes-Extérieures, du Jura, du Valais et de Saint-Gall. Plus les communes sont peuplées, plus elles utilisent ces mesures. Le caractère urbain des communes joue également un rôle important, puisque les communes-centres sont beaucoup plus nombreuses (36 %) à mettre en place de tels mécanismes que les communes de couronne d'agglomération (19 %). Il est intéressant de constater qu'environ 25 % des communes rurales utilisent des mesures d'incitation à la rénovation du milieu bâti. Ce taux est plus élevé que dans le cas des communes de couronne d'agglomération et démontre que les régions rurales se préoccupent également de valoriser leur patrimoine bâti.

Les mesures d'incitation à la rénovation et à l'amélioration structurelle du bâti sont très récentes, puisque 75 % des communes ont indiqué les avoir mises en place depuis les années 2000 seulement (Fig. 12). Au cours des cinq dernières années, le nombre de communes qui les appliquent a encore fortement augmenté, indépendamment de leur taille ou de leur caractère urbain.

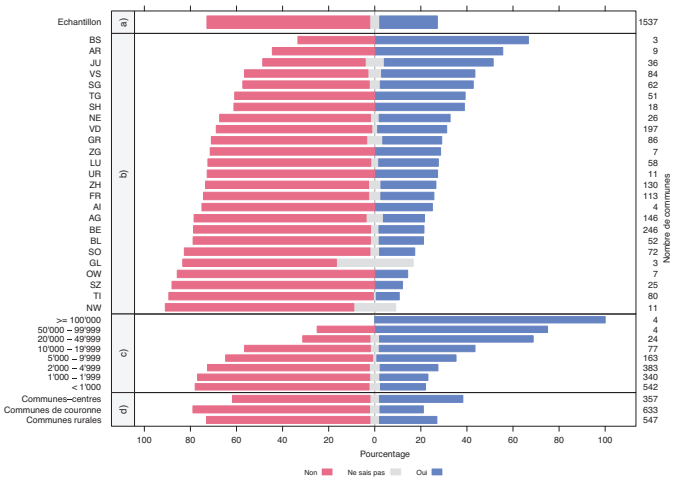

Fig. 11. Fréquence d'utilisation des mesures d'incitation à la rénovation et à l'amélioration structurelle du milieu bâti dans l'échantillon (a), et en fonction de l'appartenance cantonale (b), de la taille de la commune (c), et de la classe de caractère urbain (d).

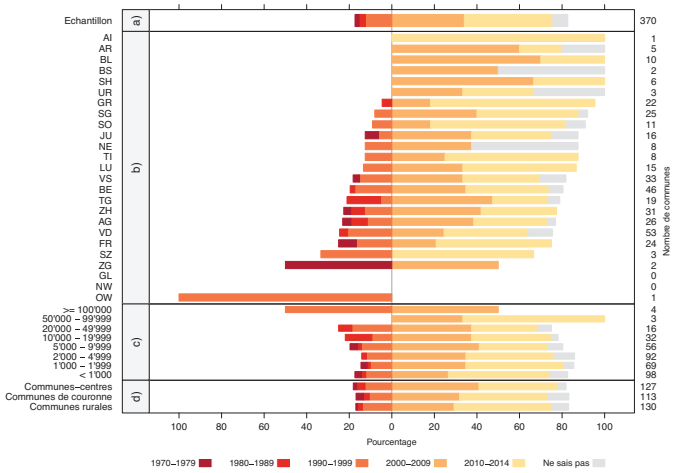

Fig. 12. Période à partir de laquelle les mesures d'incitation à la rénovation et à l'amélioration structurelle du bâti ont été utilisées dans l'échantillon (a), et en fonction de l'appartenance cantonale (b), de la taille de la commune (c), et de la classe de caractère urbain (d). L'échantillon comprend toutes les communes qui ont déclaré appliquer des mesures d'incitation à la rénovation et à l'amélioration structurelle du milieu bâti.

5 Quelles implications pour la planification communale?

Les communes suisses ont développé une large palette de mesures qui visent à développer l'urbanisation vers l'intérieur. En combinant des instruments de planification directrice et d'affectation à des mesures de politique foncière active et d'amélioration de la qualité des espaces urbains, elles ont les moyens d'influencer significativement leur développement territorial. Les mesures existantes possèdent encore un potentiel de progression. Par exemple, la plupart des programmes d'incitation à la rénovation du bâti ont été développés récemment en réponse aux enjeux liés à la densification et à la qualité des espaces urbains. Il est probable que ce type de mesures gagnera en popularité au cours des prochaines décennies.

La présente étude démontre que l'adoption de mesures de planification territoriale est fortement influencée par des facteurs contextuels tels que l'appartenance cantonale, la taille de la population et le caractère urbain. En particulier, les différences cantonales reflètent la diversité des stratégies et des processus d'exécution mis en place par les cantons suisses en matière d'aménagement du territoire (Müller-Jentsch et Rühli 2010). Mais le contexte communal joue également un rôle prépondérant. De nombreuses communes sont de petite taille et manquent de ressources administratives et financières pour orienter efficacement leur développement urbain vers l'intérieur. Aussi, leurs finances reposent principalement sur leurs recettes fiscales et elles sont en compétition avec les collectivités voisines pour attirer de nouveaux contribuables et les garder sur le long terme. Cette raison, alliée à l'importance prépondérante de la propriété privée en Suisse, rend très difficile la mise en place de mesures de planification contraignantes. Peu de communes sont à même de s'élever contre les intérêts d'acteurs économiques ou politiques importants tels que les promoteurs immobiliers ou les politiciens locaux. Indépendamment de ces considérations, de nombreuses autorités locales favorisent activement la poursuite d'un développement urbain de faible densité afin d'augmenter les recettes fiscales communales.

La question fondamentale n'est donc pas de savoir si les communes suisses ont à leur disposition des instruments de qualité pour orienter leur développement urbain vers l'intérieur. Bien plus, il s'agit de déterminer comment les encourager à en faire usage efficacement et à s'engager dans un développement urbain durable. Il convient d'aider les communes qui ont peu de ressources à choisir des instruments adaptés et à les soutenir durant leur mise en œuvre. En parallèle, d'autres processus qui dépassent le cadre strict de l'aménagement du territoire peuvent concourir à améliorer la gestion de l'urbanisation. Les réformes territoriales et les fusions de communes rendent notamment possible de mieux coordonner le dévelop-

pement urbain à l'échelle régionale. Elles dotent également les communes de plus de capacités administratives et techniques en matière d'aménagement local et peuvent augmenter leur marge de manœuvre face aux intérêts économiques et politiques locaux.

6 Perspectives et futures recherches

Les résultats complets de l'enquête sur l'organisation et les instruments de l'aménagement du territoire en Suisse seront publiés prochainement sous la forme d'un rapport (WSL Berichte) et pourront être téléchargés sur le site Internet de l'Institut fédéral de recherches WSL. Ils permettront d'obtenir une vue d'ensemble du fonctionnement de l'aménagement du territoire local. D'une part, cette enquête constitue une importante base de données pour répondre aux questions suivantes:

- Existe-t-il des groupes de communes qui adoptent des mesures de planification similaires?
- Quelle est l'influence de la planification cantonale sur l'adoption de mesures au niveau local?
- Quelles stratégies sont les plus efficaces afin d'orienter le développement urbain vers l'intérieur?
- Quels facteurs influencent l'adoption de mesures de planification particulières?

D'autre part, l'adoption de mesures d'aménagement n'est pas nécessairement garante d'un développement urbain en accord avec les principes de l'urbanisation vers l'intérieur. La mise en œuvre de ces mesures est tout aussi importante et détermine en grande partie leur efficacité à promouvoir un développement urbain compact. De futures recherches sur les mécanismes de mise en œuvre devraient apporter de nouvelles réponses dans ce domaine.

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Abstract

Steering urban development towards compact urban forms: municipal policy instruments and their application

The issues posed by urban growth are being widely discussed in Switzerland by the public and in politics. Swiss municipalities have, for several decades, been developing and adopting a wide range of policy instruments to steer their spatial development towards more compact urban forms. An overview of these instruments was obtained from a survey of all municipal planning authorities in 2014. This article draws on the survey results to describe four exemplary policy measures. The adoption of specific measures was found to vary greatly from one canton to another, and to depend on contextual factors such as the population size and the municipal's urban character. It seems that, even though most municipalities have appropriate policies at their disposal to manage their urban development efficiently and sustainably sprawling growth patterns persist. This suggests that these policies have not been applied consistently and much work has still to be done to persuade the municipalities to implement the policies better. Crucially, municipalities should be guided in their policy choices and those lacking resources should be provided with support during the implementation process.

Keywords: spatial planning, policy instruments, Swiss municipalities, urban development, compact urban forms

APPENDIX B: RAUMPLANUNG IN DEN SCHWEIZER GEMEINDEN: ERGEBNISSE EINER UMFRAGE

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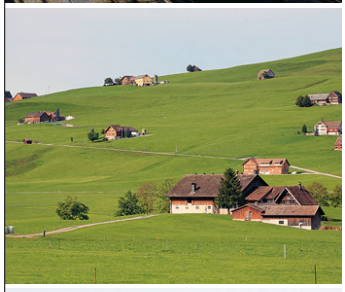
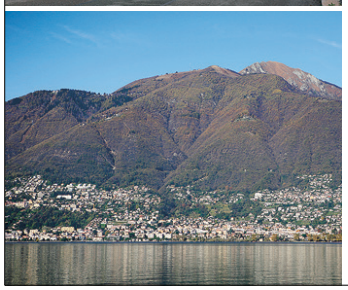
Kaiser, N., Rudolf, S., Berli, J., Hersperger, A., Kienast, F., & Schulz, T. (2016). Raumplanung in den Schweizer Gemeinden : Ergebnisse einer Umfrage. WSL Bericht 33.





Heft 42, 2016

WSL Berichte

ISSN 2296-3456

Raumplanung in den Schweizer Gemeinden: Ergebnisse einer Umfrage

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Dank

Die Erhebung, auf der dieser Bericht basiert, wurde von Oktober 2013 bis Januar 2014 konzipiert. Ihre Durchführung fand zwischen Januar 2014 und Mai 2014 sowohl online als auch schriftlich statt. Zunächst möchten wir ganz herzlich all jenen Personen in den Gemeinden danken, die sich die Mühe genommen haben, unseren Fragebogen auszufüllen und an uns zurückzusenden. Der grosse Aufwand wäre ohne die wertvolle Unterstützung Dritter nicht zu bewältigen gewesen. Besonderer Dank geht an die Mitarbeitenden der Geschäftsstelle des Vereins für Landesplanung (VLP) in Bern, namentlich Lukas Bühlmann, für wertvolle Gespräche zur Klärung der Begrifflichkeiten in der kommunalen Raumplanung und für die Durchsicht eines Entwurfs des Fragebogens. Sowohl dem VLP als auch dem Schweizerischen Gemeindeverband danken wir dafür, dass wir die Befragung in der Zeitschrift «Schweizer Gemeinde» und über die E-Mail-Verteiler der beiden Organisationen bei ihren Mitgliedern ankündigen durften. Den Verantwortlichen der kantonalen Planungsbehörden gebührt unser Dank für die Unterstützung beim Zusammentragen der Adressen von Ansprechpartnern in den Gemeinden. Des Weiteren möchten wir uns bei den Mitarbeiterinnen der Druckzentrale der WSL für die tatkräftige logistische Unterstützung beim Druck und Versenden der Fragebögen bedanken. Wir danken überdies Silvia Tobias und Marco Pütz für die Durchsicht des Manuskripts und Maria Mondini für ihre Unterstützung bei der Übersetzung des Fragebogens ins Italienische.

Die Autoren und Autorinnen

Zusammenfassung

Die Siedlungsflächen in der Schweiz dehnen sich stark und dispers aus. Zwischen 1985 und 2009 haben sie um mehr als die Fläche des Genfersees zugenommen (BFS, 2015). Fortwährend werden dabei die Grenzen zwischen der offenen Landschaft und dem urbanen Raum verwischt. Fruchtbares Agrarland geht verloren, der Energieverbrauch und die Infrastrukturkosten steigen. Politik und Wissenschaft sind sich einig: Die Siedlungsentwicklung muss durch geeignete Planung stärker gesteuert werden. Gemäss der Bundesverfassung ist es die gemeinsame Aufgabe von Bund, Kantonen und Gemeinden, eine zweckmässige und haushälterische Bodennutzung zu gewährleisten. Die Planungskompetenz liegt bei den Kantonen, während die Bundesebene lediglich Grundsätze definiert. In den Gemeinden werden die kantonalen Richtpläne mit kommunalen Nutzungsplänen umgesetzt. Hier treffen die Ansprüche von Planern, Eigentümern, dem Baugewerbe sowie den Natur- und Heimatschützern aufeinander. Als Reaktion auf die unerwünschten räumlichen Entwicklungen der letzten Jahrzehnte wird das Raumplanungsgesetz revidiert (1. Etappe in Kraft seit Mai 2014, 2. Etappe in Bearbeitung). Empirische Daten zur Raumplanung auf Gemeindeebene wurden bisher vor allem im Rahmen von Fallstudien erhoben. Es fehlt hingegen eine Gesamtschau die zeigt, (1) welche Massnahmen in den letzten Jahrzehnten von den Gemeinden eingesetzt wurden, um die Siedlungsentwicklung zu steuern und (2) wie die Gemeinden ihre Raumplanung organsieren.

Um diese Lücke zu schliessen wurde im Jahr 2014 im Rahmen zweier Nationalfondsprojekte[1] eine Umfrage unter allen Schweizer Gemeinden durchgeführt (Rücklauf: 69%). Die Gemeinden wurden zu ihren administrativen Strukturen und zum Einsatz und Einsetzungszeitpunkt von 20 Instrumenten zur Steuerung der Siedlungsentwicklung befragt. Der vorliegende Bericht beschreibt die durch die Gemeindeumfrage 2014 gewonnen Informationen im Sinne einer Dokumentation der Umfrageergebnisse.

Nach einem kurzen Beschrieb der Erhebungs- und Analysemethoden (Kapitel 2 und 3) stellen die Kapitel 4 bis 9 des vorliegenden Berichts die Antworten zu allen Fragen dar, jeweils ausgewertet nach Kanton, Einwohnerzahl und Urbanisierungsgrad der Gemeinde. Kapitel 10 fasst die Hauptergebnisse summarisch zusammen. Es ist wichtig, zu betonen, dass es sich bei den Daten um Selbstdeklarationen der Gemeinden handelt, und dass diese Angaben nicht auf ihre Übereinstimmung mit kantonalen Vorgaben geprüft wurden.

Heute wendet eine Gemeinde im Schnitt 5.7 der 20 in der Umfrage aufgelisteten Instrumente an, wobei es grosse Unterschiede gibt: Während 18.2% der Gemeinden zehn und mehr Instrumente vorsehen, haben 8.5% keines angegeben. Dabei fallen die Raumplanungsregionen der Innerschweiz, der Ostschweiz und wenige Zentren der Westschweiz mit vielen Instrumenten auf. Wenige Instrumente setzen Gemeinden in den Raumplanungsregionen entlang des Jurakamms, im Berner Oberland und der italienischen Schweiz ein.

Die vier heute am weitesten verbreiteten Instrumente sind der kommunale Richtplan, das kommunale Leitbild, die Definition von Freihaltezonen und die Heraufsetzung der Nutzungsziffer. Zusätzlich beliebt unter grossen Gemeinden (Einwohnerzahl ≥10‘000) sind die Festlegung höherer Nutzungsziffern mittels Sondernutzungsplan, die Verbesserung der städteplanerischen Qualität und die Umzonung in Zonen mit höherer Nutzungsziffer. Im Allgemeinen setzen grosse Gemeinden häufiger eine Vielzahl von Instrumenten ein. Zwei Instrumente sind unter den kleineren Gemeinden (Einwohnerzahl <10‘000) sehr verbreitet, nämlich die minimale Nutzungsziffer und Massnahmen gegen die Baulandhortung.

Viele kommunale Raumplanungsinstrumente sind noch jung: 69% der heute in den Gemeinden vorgesehenen Massnahmen wurden erst nach der Jahrtausendwende eingeführt. Vor dem Inkrafttreten des RPG im Jahr 1980 verfügten bloss einzelne Gemeinden (15.2%) über erste Instrumente.

Die Erhebung erlaubt auch viele interessante Einsichten zur Organsation der Raumplanung in den Gemeinden. Sie zeigt z.B., dass zwei Drittel (68.9%) der Gemeinden erwarten, durch die Revision des Raumplanungsgesetzes an Planungsautonomie einzubüssen, und dass die kommunale Raumplanung recht stark professionalisiert ist. So gibt es in 39.3% der Gemeinden eine Verwaltungseinheit mit raumplanerischen Pflichten und beinahe alle Gemeinden (88.6%) arbeiten mit externen Planungsbüros zusammen.

[1] SPROIL «Siedlungsentwicklung steuern – Bodenverbrauch verringern» (NFP68, 406840_142996) und «Determinanten raumplanerischer Massnahmen und ihrer Verbreitung sowie deren Wirkung auf die Zersiedelung» (SNF, 143440)

Der Bericht bietet einen Überblick über die Verbreitung der raumplanerischen Instrumente auf Gemeindeebene wie er bisher nicht existierte. Die erhobenen Daten können unter anderem als Grundlage für Evaluationen von Instrumenten und Organisationsformen dienen und helfen, Vollzugshindernisse und Kapazitätsprobleme zu erkennen.

Synthèse

En Suisse, les zones urbaines croissent fortement et de manière dispersée. Entre 1985 et 2009, elles ont augmenté d'une surface supérieure à celle du lac Léman (BFS, 2015). Ce faisant, la frontière entre paysages ouverts et surfaces construites devient floue. Des terres agricoles fertiles disparaissent, tandis que la consommation d'énergie et les frais d'infrastructure augmentent. Face à ces constats, politiques et scientifiques sont unanimes: le développement urbain doit être guidé par une planification adéquate. Selon la Constitution fédérale, la responsabilité d'un aménagement du territoire mesuré et adapté incombe conjointement à la Confédération, aux cantons et aux communes. Concrètement, les cantons possèdent la plus grande compétence en matière d'aménagement, tandis que les principes directeurs sont définis au niveau fédéral. Finalement, les communes mettent en œuvre les plans directeurs cantonaux par l'intermédiaire de leurs plans d'affectation. C'est ainsi au niveau communal que s'opposent les attentes des urbanistes, des propriétaires, de l'industrie du bâtiment et des protecteurs de la nature et du patrimoine. En réaction aux développements indésirables apparus au cours des dernières décennies, la Loi sur l'aménagement du territoire est actuellement en révision (1ère étape en vigueur depuis mai 2014, 2ème étape en cours). Jusqu'à présent, l'aménagement local a cependant été étudié principalement au moyen d'études de cas. Il manque une vue d'ensemble qui montre d'une part quelles mesures ont été mises en place par les communes suisses afin de guider leur développement urbain depuis les années 1970, et qui indique d'autre part comment l'aménagement du territoire est organisé au niveau communal.

Afin de combler cette lacune, une enquête a été conduite en 2014 dans le cadre de deux projets du Fonds nationa[2] (taux de réponse : 69%). Les communes suisses ont été interrogées sur leurs structures administratives et sur l'utilisation de 20 mesures qui visent à orienter leur développement urbain vers l'intérieur. En outre, elles ont été invitées à préciser depuis quand elles appliquent ces mesures. Le présent rapport décrit les informations gagnées au cours de cette enquête et documente les résultats obtenus. Après une courte description du déroulement de l'enquête et des méthodes d'analyse (chapitres 2 et 3), ce rapport liste les réponses à toutes les questions par canton, classe de population et classe de caractère urbain (chapitres 4 à 9). Il est important de souligner qu'il s'agit de déclarations relevant de la responsabilité des communes, et que la cohérence de ces informations avec les prescriptions cantonales n'a pas été vérifiée.

Aujourd'hui, une commune utilise en moyenne 5.7 des 20 mesures listées dans l'enquête. Le nombre total de mesures appliquées varie cependant fortement d'une commune à l'autre. Alors que 18.2% d'entre elles prévoient dix mesures ou plus, 8.5% n'en emploient aucune. Les régions d'aménagement de Suisse centrale, de Suisse orientale et de quelques centres de Suisse romande se distinguent par un grand nombre de mesures. Le long de la chaîne du Jura, dans l'Oberland bernois et en Suisse italienne, leur distribution est plus faible.

Les quatre mesures les plus répandues aujourd'hui sont le plan directeur communal, la conception directrice communale, la définition de zones à maintenir libres de toute construction et le rehaussement des indices d'utilisation du sol. En outre, les grandes communes (nombre d'habitants ≥10 000) fixent souvent des indices d'utilisation du sol plus importants par l'intermédiaire de plans d'affectation spéciaux, améliorent la qualité de l'aménagement urbain et opèrent des changements d'affectation afin d'augmenter la densité de construction. De manière générale, les grandes communes utilisent une plus grande diversité de mesures. Au sein des petites communes (nombre d'habitants <10 000), deux d'entre elles sont particulièrement fréquentes : l'indice

[2] Projet SPROIL « Contrôler le mitage du territoire – Réduire l'utilisation du sol » (PNR68, 406840_142 996) et projet « Facteurs déteminant les mesures d'aménagement du territoire, leur diffusion et leur impact sur l'étalement urbain» (FNS, 143 440)

minimal d'utilisation du sol et la lutte contre la thésaurisation des terrains à bâtir.
De nombreuses mesures communales d'aménagement du territoire sont encore récentes : 69% d'entre elles n'ont été introduites qu'après le début du siècle. Avant l'entrée en vigueur de la LAT en 1980, seules quelques communes (15.2%) disposaient de premières mesures.
L'enquête permet également d'obtenir un aperçu des préoccupations et de l'organisation des communes en matière d'aménagement du territoire. Par exemple, deux tiers des communes (68.9%) ont indiqué s'attendre à subir une perte d'autonomie suite à la révision de la Loi sur l'aménagement du territoire. Aussi, les résultats démontrent que l'aménagement du territoire est fortement professionnalisé dans les communes suisses. Dans 39.3% des cas, l'administration communale compte une unité avec des responsabilités d'aménagement, tandis que pratiquement toutes les communes (88.6%) ont recours à des bureaux d'étude externes.
Les résultats présentés dans ce rapport donnent pour la première fois une vue d'ensemble de la répartition des mesures d'aménagement du territoire au niveau des communes. Les données collectées peuvent servir de base pour l'analyse des instruments et de l'organisation de l'aménagement du territoire à l'échelon communal et aident à mieux cerner les problèmes de capacité et d'exécution existants.

Sintesi

In Svizzera le aree urbanizzate si stanno espandendo sempre di più in modo molto veloce e diffuso. Tra il 1985 e il 2009, le superfici urbanizzate sono aumentate di un'area superiore a quella del Lago Lemano (BFS, 2015). Al contempo, i confini tra paesaggio aperto e spazio urbano sono diventati sempre più labili. Le superfici agricole fertili diminuiscono, mentre il consumo di energia e i costi per le infrastrutture aumentano considerevolmente. Il mondo politico e quello economico sono concordi sul fatto che lo sviluppo urbano debba essere regolato attraverso un'idonea pianificazione. Secondo la Costituzione federale, il compito condiviso tra la Confederazione, i Cantoni e i Comuni è quello di garantire un appropriato e parsimonioso uso del suolo. La competenza più alta in materia di pianificazione territoriale spetta ai Cantoni, mentre la Confederazione ne stabilisce solo i principi. A livello comunale, dove i piani direttori cantonali vengono messi in pratica con i piani urbanistici, si incrociano le priorità individuali di progettisti, proprietari, industria delle costruzioni, così come di ambientalisti e cittadini In risposta al più generale riconoscimento della diffusa insostenibilità dello sviluppo urbano più recente, in Svizzera si sta attualmente riformando la Legge Federale per la Pianificazione Territoriale, di cui la prima parte è stata promulgata nel Maggio 2014, mentre la seconda parte è in discussione. Le analisi empiriche condotte sulle pratiche di pianificazione comunale si sono concentrate prevalentemente su casi studio, mentre mancano ancora dati riguardanti la situazione generale in cui versa la pianificazione urbana svizzera a livello comunale, sia (1) rispetto a quali strumenti di pianicazione urbana i Comuni abbiano implementato negli ultimo decenni, sia (2) rispetto a come i Comuni abbiano messo in pratica localmente le attività di pianificazione.
Per colmare questa lacuna, nel 2014, nell'ambito di due progetti del Fondo nazionale svizzero per la ricerca scientifica[3], è stata svolta un'indagine su tutti i Comuni svizzeri (tasso di partecipazione: 69%). I Comuni sono stati consultati in merito alle loro strutture amministrative e agli strumenti da essi previsti riguardo alla pianificazione del territorio. Gli intervistati hanno inoltre fornito informazioni – anche in forma retrospettiva (sino al 1970) – sulla data di introduzione degli strumenti stessi. La presente relazione riassume i principali risultati dell'indagine.
Dopo una breve descrizione dei metodi utilizzati per la raccolta dei dati e delle analisi effetuate (capitoli 2 e 3), i dati della ricerca vengono presentati, fornendo anche i valori medi ottenuti per cantone, dimensione del Comune e tipo di urbanizzazione (capitolo 4 a 9). Il capitolo 10 propone una sintesi delle principali conclusioni della ricerca. È importante sottolineare che i dati derivano da autodichiarazioni dei Comuni e che non è stato possibile verificare la loro conformità con le prescrizioni cantonali.
Oggi un Comune impiega in media 5.7 dei 20 strumenti elencati nell'indagine. I set di misure adottati si differenziano però notevolmente da un Comune all'altro. Mentre il 18.2% dei Comuni prevede dieci o più strumenti, l'8.5% non ne usa nessuno. Dal punto di vista

[3] Progetto SPROIL »Controllare lo sviluppo dell'urbanizzazione – Ridurre il consumo di suolo" (NFP68, 406840_142996) e progetto »Misure determinanti nella pianificazione del territorio: diffusione ed effetti sulla dispersione degli insediamenti" (SNF, 143440).

regionale, i Comuni che utilizzano più misure si trovano in Svizzera centrale, Svizzera orientale e in misura minore in Svizzera occidentale. Quelli che utilizzano invece meno misure si trovano nelle regioni lungo il Giura, dell'Oberland bernese e della Svizzera italiana.

Attualmente, i quattro strumenti più diffusi sono il piano direttore comunale, le linee guida comunali, la definizione di zone non edificabili e l'aumento del coefficiente di utilizzazione del suolo. Molto popolari nei Comuni più grandi (numero di abitanti ≥10'000) sono inoltre la definizione di coefficienti di utilizzazione più alti tramite un piano regolatore speciale, il miglioramento della qualità di progettazione della città e la riqualifica delle aree in zone con coefficiente di utilizzazione più alto. Invece, i due strumenti più diffusi soprattutto tra i Comuni più piccoli (numero di abitanti <10'000) sono il coefficiente di utilizzazione minimo del suolo e le misure per contrastare la speculazione urbana.

Molti degli strumenti di pianificazione territoriale a livello comunale sono di recente introduzione: il 69% delle misure oggi previste nei Comuni è stato implementato solo a partire dal nuovo millennio. Prima dell'entrata in vigore della Legge Federale per la Pianificazione Territoriale nel 1980, erano pochi i Comuni (15.2%) che applicavano alcuni degli strumenti previsti. L'indagine aiuta anche a comprendere l'organizzazione amministrativa interna al sistema di pianificazione urbana a livello comunale, e mostra come, ad esempio, i due terzi (68.9%) dei Comuni prevedono di perdere parte della loro autonomia decisionale rispetto alla pianificazione urbana come conseguenza dell'attuale riforma della Legge di Pianificazione Territoriale. Inoltre, dall'indagine risulta che le pratiche di pianificazione urbana comunale sono altamente professionalizzate, dato che il 39.3% dei Comuni include al loro interno un'unità amministrativa dedicata alle sole attività di pianificazione, considerando anche che la quasi totalità dei Comuni analizzati (88.6%) impiega consulenti esterni.

I risultati illustrati nella presente relazione forniscono una panoramica sulla diffusione delle misure di pianificazione territoriale a livello comunale, costituendo il principale carattere di originalità della ricerca. I dati raccolti possono costituire inoltre la base, tra l'altro, per successive analisi di valutazione degli strumenti e delle strutture organizzative di pianificazione urbana e territoriale, nonché di identificazione di possibili problematicità legate alle capacità attuative dei Comuni rispetto agli strumenti di pianificazione considerati.

Summary

The already extensive built-up areas in Switzerland increased even further between 1985 and 2009 by more than the area of Lake Geneva (BFS, 2015). The borders between rural and urban areas are becoming increasingly blurred. Much fertile agricultural land is being lost, and energy consumption and infrastructure costs are rising. Most politicians and scientists now agree that it is essential for future developments to be better guided by planning. According to the Federal Constitution, the federal government, cantons and municipalities are jointly responsible for ensuring that land use is sustainable. The cantons have the planning competence, while the federal government merely defines basic principles. The municipalities are required to implement the content of the cantonal comprehensive plans in their local land-use plans. On this level, however, implementation is influenced by stakeholders, including land owners, political parties, construction firms, planners, and environmental and cultural conservationists, which all have different priorities.

As a reaction to a broad recognition that recent spatial development has been largely unsustainable, the Swiss Federal Planning Act is currently under revision (first part enacted in Mai 2014, second part in progress). Empirical data on municipal spatial planning has to date been developed mainly in case studies whereas data more systematically describing the state of spatial planning at the municipal level has been missing, particularly regarding (1) which planning instruments municipalities have been implementing in the past decades and (2) how municipalities have been organizing spatial planning.

In 2014 all Swiss municipalities were surveyed as part of two National Science Foundation projects[4]. The return rate was 69%. The municipalities were asked

[4] Project SPROIL «Controlling urban sprawl – limiting soil consumption» (NFP68, 406840_142996) and Project «What are the determinants of local growth management regulations at the municipal level and how do they affect urban sprawl? A spatial econometric analysis» (SNF, 143440)

about their administrative structures, the instruments they provide in the field of spatial planning and when, since 1970, these instruments were introduced. This report summarizes the results of the survey.

A short description of methods regarding data collection and analysis (chapter 2 and 3) is followed by a presentation of the data, providing average values for the cantons, municipal size and urbanization classes (chapter 4 to 9). Chapter 10 synthesizes the main conclusions. The findings are, it should be noted, based on the municipalities' self-declarations and have not been tested for conformity with cantonal regulations.

Today the average municipality applies 5.7 of the 20 instruments listed in the survey, but the municipalities differ greatly, with 18.2% implementing ten or more instruments, and 8.5% none. In the planning regions of Central Switzerland, Eastern Switzerland and some centers in Western Switzerland many instruments are used, whereas few are used along the Jura ridge, in the Bernese Oberland and the Italian part of Switzerland.

The most widely used instruments are comprehensive plans, spatial planning guidelines, the designation of conservation zones to limit urban expansion, and the raise of maximum utilization densities. In municipalities with populations ≥10,000 the following instruments appear to be popular: density bonuses implemented with special-district plans, programs for improving urban quality and rezoning of areas that allow higher utilization densities. In general, large municipalities often implement many of the listed instruments. Two instruments widely used in smaller communities with populations <10,000 are the specification of minimum utilization densities and measures to prevent land hoarding.

Many instruments have only been introduced recently, e.g. 69% of those used today since the millennium. Before the Spatial Planning Act became effective in 1980, few municipalities (15.2%) applied any instrument. The survey also provides many interesting insights regarding the administrative organization of municipal spatial planning. It shows, for example, that two-thirds (68.9%) of the municipalities expect to lose some of their planning autonomy due the revision of the Spatial Planning Act and that municipal spatial planning is highly professionalized with 39.3% of the municipalities having an administrative unit with spatial planning tasks and nearly all (88.6%) employing external consultants.

The report provides a novel overview of the dissemination of planning measures at the municipal level. The data is suited to build the base for, amongst other things, the evaluation of instruments and organizations and the identification of capacity problems.

Inhaltsverzeichnis

ACKNOWLEDGEMENTS

I owe gratitude to everyone who has encouraged and guided me along the journey of this PhD:

I am grateful to Anna Hersperger for having shared her knowledge and experience of science with me, as well as for her meticulous, timely and much appreciated correction of my manuscripts. Many thanks also go to Felix Kienast for his great availability, encouragement and support throughout the whole PhD project. Furthermore, I would like to acknowledge Adrienne Grêt-Regamey and Stefan Siedentop for being the co-referees of this thesis, and James Kirchner for agreeing to take on the role of chairperson at short notice. This research was funded by the Swiss Federal Research Institute WSL and by the Swiss National Science Foundation, as part of the project "Controlling urban sprawl to limit soil consumption" (SPROIL, grant number 406840_142996/2) conducted within the National Research Programme "Sustainable Use of Soil as a Resource" (NRP68). The Swiss-wide survey was conducted in collaboration with the project "Determinants of Local Growth Management Regulation and Its Relation to Urban Sprawl. A Spatial Econometric Analysis at the Municipal Level" (grant number 143440), funded by the Swiss National Science Foundation and conducted by Jan Berli and Tobias Schulz.

Many thanks also go to Simona Grădinaru for her invaluable help in writing the two papers on plan evaluation and for her encouragement during the last stressful weeks of this PhD. I am also indebted to Matthias Müller for helping me with the coding and analysis of the local plans and to Otto Wildi for sharing his statistical knowledge with me and taking time to answer my many questions. I am very grateful to all of the local and cantonal planning officers who took part in the surveys and the interviews conducted in the context of this PhD project. This thesis would not have been possible without their participation and their willingness to share their professional experiences with me. Many thanks also to Lukas Bühlmann and Christa Perregaux DuPasquier from the VLP-ASPAN, who provided assistance with the translation of spatial planning terms in the context of the Swiss-wide survey.

Many thanks also to Sarah Radford, Curtis Gautschi and Silvia Dingwall for the conscientious proofreading of my thesis and manuscripts. I also wish to thank Christin Loran for the translation of my summary into German, and for always being there to share the ups and downs of PhD life with me. Furthermore, I would like to thank all my colleagues of the HL E floor at WSL for the friendly working atmosphere, the many enriching conversations and laughs, and the enjoyable group excursions. I am also grateful to all of my friends from WSL, Zürich, Lausanne, Neuchâtel and beyond for all the wonderful moments we have spent together and for cheering me up in times of difficulty.

Finally, I would like to express my utmost gratitude to my family for continually supporting me and giving me the strength to keep moving forward. Above all, thank you Christoph for being always on my side. I would not have managed to get through the last four years without your continuous love and support.

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