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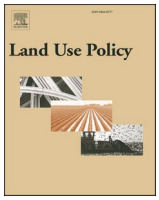

Planning-related land value changes for explaining instruments of compensation and value capture in Switzerland

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ABSTRACT

As a public policy, planning seeks to achieve politically defined policy objectives such as sustainable spatial development. To effectively attain these objectives, it is essential to consider the impact of planning decisions on land values. A comprehensive understanding of the connection between planning and land values is imperative for making well-informed choices regarding the management of land use and spatial development sustainably and responsibly. While instruments of planning law are intensively debated within the planning community, their implicit effects on land values are rarely considered. This study contributes to the field by demonstrating the crucial connection between planning-induced land value changes and value capture instruments in Switzerland. Our analysis shows significant value changes in the planning process. It connects these to redistributive instruments of the Swiss planning regime, which come into play to compensate for disproportionate planning-induced advantages or disadvantages of landowners. Due to the exceptionally significant change in value while zoning, which is present in Switzerland, there are remarkable redistributive instruments - both in terms of value increase (added value capture) and value decrease (compensation). Our study shows that knowledge of planning-related land value changes can help understand redistributive mechanisms, thereby contributing to best-practice debates.

1. Introduction

Land is a commodity that can be traded between private parties at market conditions (Gerber and Gerber, 2017). Accordingly, land is attributed to a price. This value is derived from a combination of factors, ranging from local conditions (e.g., soil quality) to macroeconomic developments (e.g., financial policy, economic development) (Hong and Brubaker, 2006). One essential factor that determines land values is planning (Buitelaar and Sorel, 2010). Concretely, every planning phase, from agricultural land to a plot ready for construction, increases the land value. National planning regimes – through defining planning phases – thus affect when land values rise, how much, and who profits from these value increases.

Understanding the interdependence between planning interventions and land values is a precondition for reaching ecological and social policy goals (Dransfeld and Voß, 1993). The planning law contains two levers that regulate value development: the defined planning phases and the redistribution of planning-related value gains.

1. As a piece of agricultural land runs through the various planning phases, from zoning, via land readjustment and servicing to issuing a building permit, each phase marks a significant land value change.
2. The planning law regulates who reaps these profits by introducing public value-capture instruments. Given that these instruments are adjusted to planning-induced value developments, they contribute to sustainable spatial development.

Cross-country comparisons can show how various planning regimes align these two levers. However, few studies combine an analysis of planning phases with an analysis of instruments of public value capture.

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Earlier research has compared forms of and shown essential preconditions for successfully implementing public value capture (Alterman, 2011). Still, such studies neglect the role of planning-induced value increases in explaining what instruments of value capture a government employs. The impact of planning on land values is extensively studied from an urban economic perspective. Individual factors and their influence are examined (Büchler and Ehrlich, 2023), and various models are applied to land markets (Rodas et al., 2018). The effects of specific regulations on certain subsectors of planning have also been studied, such as housing prices (Huang and Tang, 2012; Ihlanfeldt, 2007; Jalali et al., 2022; Lin and Wachter, 2019). Ahlfeldt and Pietrostefani (2019) synthesise the economic effects of density, including the impact of planning regulations on land values. While the paper does not focus solely on Europe, it offers valuable insights into the relationship between planning and land values in European urban contexts.

The impacts have rarely been explicitly examined from a planning law perspective. A notable exception is Jaeger (2006), who applies economic models to Oregon planning law. However, these studies do not include a political science interpretation of planning law regarding the different planning phases and redistributive instruments. Against the backdrop of this gap, we aim to shed light on the interdependence between planning phases as defined in planning law, the resulting land value development, and the instruments applied to deal with such value changes.

To this end, we apply a model of Bonczek and Halstenberg (1963), initially describing planning phases and their effects on land values in Germany, to the context of Switzerland. Switzerland is one of the few countries worldwide that apply a direct form of public value capture (Muñoz Gielen and van der Krabben, 2019; OECD, 2022; Scheiwiller and Hengstermann, 2022). Notably, we ask: (1) What value increases are caused by the planning phases defined in the Swiss planning law, and (2) how are these value increases treated in the planning law?

Applying the model to Switzerland, we find that direct value capture is employed in a planning phase whose resulting value increase is much higher than was foreseen in the German model. This suggests that, amongst the factors observed in earlier studies, planning-induced value increases help explain what forms of value capture are chosen.

2. Planning-induced land value changes

Planning is one of several factors affecting land values (Büchler and Ehrlich, 2023). These factors were earlier divided into four categories: intrinsic factors (e.g., soil quality), external factors, public investment, and user investment by Hong and Brubaker (2006). They pointed out that the central political question is whether respective changes in value were caused by the actions or investments of the landowner or are due to developments independent of the landowner. However, Hong and Brubaker do not distinguish between public investments directly linked to the land (e.g., servicing) and public investments near the affected land (e.g., school infrastructure). Moreover, they see regulation merely as a general external factor. Here, however, a more precise distinction is necessary between general abstract regulations (e.g., national public policy) and the concrete regulations related to a specific property, whereby the latter can then be differentiated again concerning various planning phases.

Planning phases and their impact on land values were extensively described by Bonczek and Halstenberg (1963). For the first time, they examined the effects of planning phases on land values (see Fig. 1). With their model ('staircase model'), they illustrated on the one hand that the public sector already captured specific value increases during land readjustment (through the reallocation advantage and the transfer of land). On the other hand, they showed that a large part of the value increases remained untouched. They, therefore, explicitly understand their model in the context of a debate on a fair and feasible regulation for the general capture of planning-related added value, as was the case in England at the time. The law was intended to ensure that landowners are neither disadvantaged nor advantaged by public planning measures.

Several authors have revisited this model in recent years and applied it to analyse land value development in several countries and contexts. Davy (2018) applies the model in a 4-step version to German legislation to explain the difference between planning and land policy. Christensen (2014) uses the model with a specific focus on municipal planning in Denmark. Kalbro and Mattsson (2018) use the model both to analyse the institutional regime at the national level in Sweden and as an analytical framework for selected case studies. Finally, the model has been used as a framework for comparative research, such as the

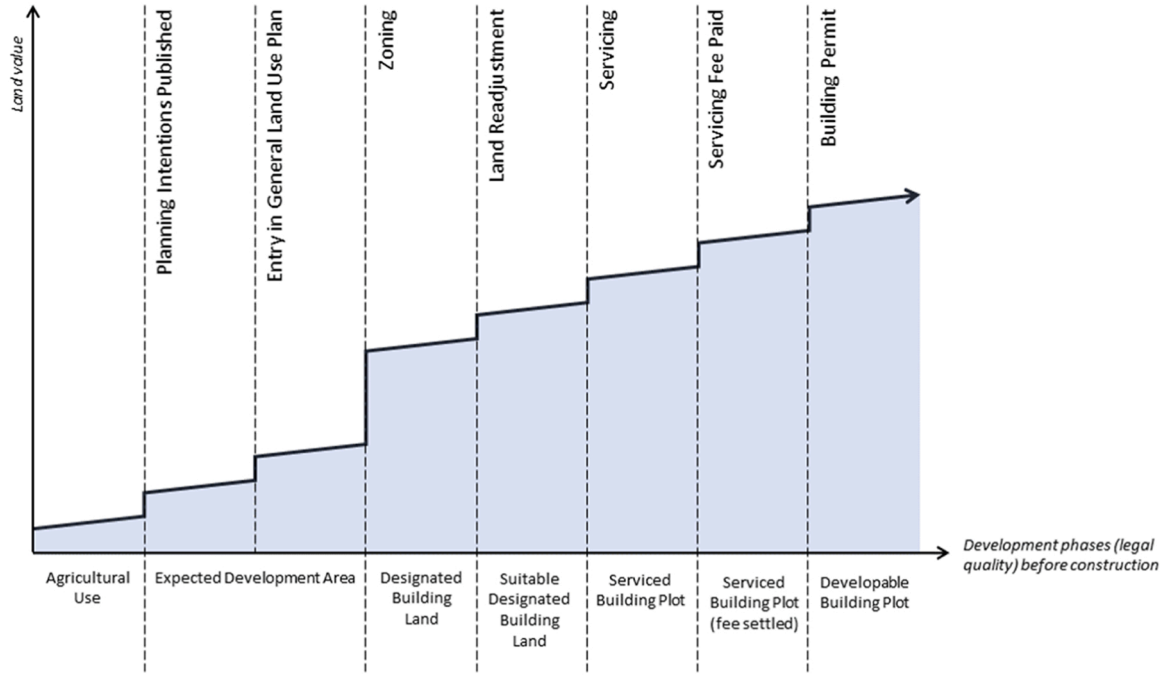

Fig. 1. Model of planning phases after Bonczek and Halstenberg (1963).

five-country comparison by Dransfeld and Voß (1993) and the most recent comparison by Halleux et al. (2022), covering 29 European countries.

Dransfeld and Voß (1993) compared five European countries and their land markets. They examined the extent to which the various state regulations influence the respective land market systems so that spatial development takes place in the desired locations - regarding ecological and social goals of spatial planning. They, therefore, considered the planning influence on land values as an implementation mechanism for indirectly achieving public objectives by influencing the behaviour of landowners.

Halleux et al. (2022) used the model to specifically analyse the regulations dealing with value capture and compare them between 21 European countries. The work follows a series of studies that represent a renaissance of scholarly interest in public value capture, starting with Alterman (2011), who discusses preconditions for successful value capture. Her analysis of 14 countries unveils two approaches that she calls direct and indirect instruments. This division was taken up and developed further by Muñoz Gielen and van der Krabben (2019), who, in their cross-country comparison, focus on the application of (non-) negotiable developer obligations.

The instrument of value-added capture is seen as a redistributive counterpart to the compensation that occurs when development rights are withdrawn (see with particular reference to the case of Belgium: Lacoere et al., 2023). Alterman (2010) has conducted a comparative study that shows compensation mechanisms in various countries. As much as they differ in detail, the study reveals that compensation mechanisms are much more common than value-added compensation mechanisms. However, the findings are not linked to planning phases.

Overall, the literature review shows that planning phases, their effects on land values and redistribution of value changes have been discussed in their parts but not considered in their entirety. This study addresses these interdependencies within the Swiss planning regime, which represents an interesting case due to its very high land prices and rigorous planning system.

3. Planning phases in Switzerland

In the subsequent section, we will apply Bonczek's model of planning phases to the Swiss context. The planning phases in Switzerland are derived from the Swiss Spatial Planning Act (SPA). Unfortunately, we cannot utilise nationwide land value data due to its restricted accessibility (see Section 5.3). As a result, the depicted price jumps in the graph are indicative and rely on case studies, Swiss planning practitioners' journals, and newspaper articles for reference.

The Swiss planning system distinguishes buildable and non-buildable zones (art. 1 SPA). While construction is generally permitted in the buildable zone unless there is an explicit rule to the contrary (negative planning), development is generally not allowed in the non-buildable zone unless there is an explicit exception (positive planning) (Griffel, 2017). This stringent restriction limits growth but does not prohibit further development, as agricultural land can also fall within the buildable zone. In fact, between 2009 and 2018, the settlement area in Switzerland expanded by 6% (FSO, 2022).

We distinguish between seven planning phases (see Fig. 2). The phases may contain further sub-steps, which cannot always be precisely demarcated from each other and are, therefore, not shown by us as separate phases. The model is based on the classical linear land development sequence– from agricultural area to the issuing of a building permit. Possible variants arising from less linear processes in practice or deviating situations (e.g., brownfield development) are not considered.

3.1. Agricultural use and expected development area

The first tier comprises land in the non-buildable zone, mostly land used for agricultural production, which is why this land is also referred to as an agricultural zone (Art. 14 para. 2 SPA). In addition, this category includes land that is important for the landscape or is ecologically valuable (Art. 16 para. 1 SPA) (Ruegg and Letissier, 2015).

Land value within the agricultural zone is measured based on agricultural profitability, depending on factors such as soil quality, shape and location. A unique characteristic is that the agricultural land value in some Alpine regions can even be negative, as the cultivation produces more costs than direct profits. In these cases, cultivation only makes sense because of the external effects, e.g., to reduce natural hazards caused by landslides. In such cases, the public sector finances the management or ownership of such areas.

In addition to the Spatial Planning Act, agricultural land is subject to

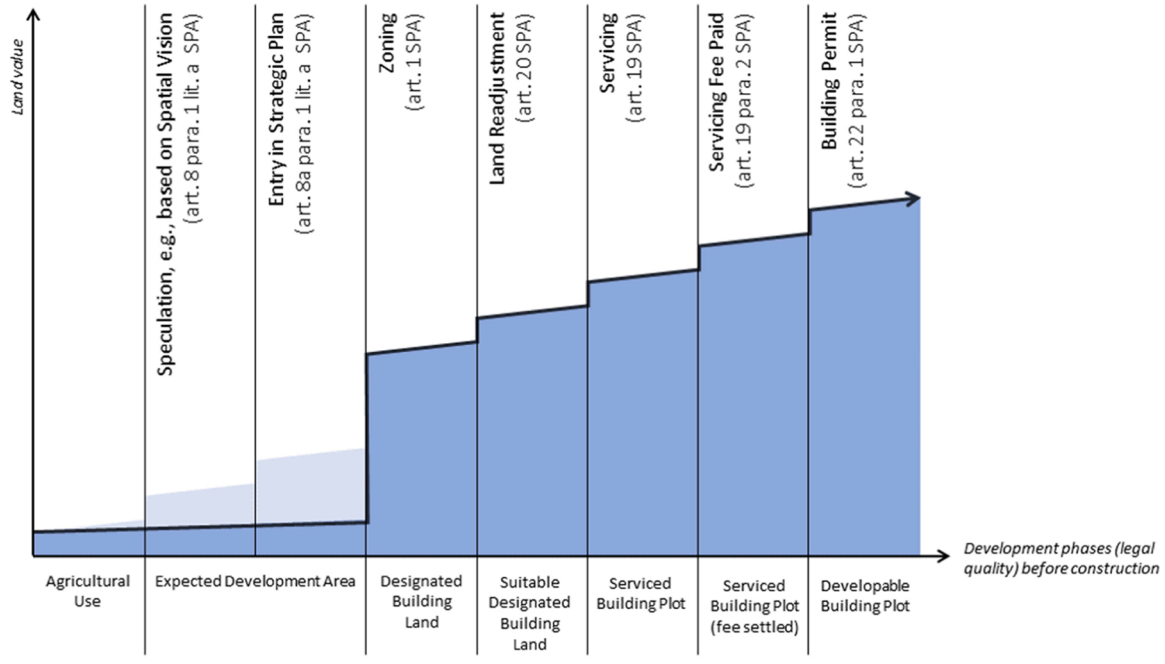

Fig. 2. Planning phases adapted to Switzerland. Value increases and phase length indicative.

further legal provisions that influence land value, particularly by eliminating speculation on future developments. The most important legal source is the Peasant's Land Act (BGBB), which contains two relevant regulations (Braun, 1983). First, this act limits speculations on land value by prohibiting land transfers with more than a +5–15% value increase – calculated in relation to the adequate price for agricultural land (Art. 66 BGBB). Second, it outlaws non-agricultural persons' purchase of agricultural land (Art. 61 para. 1 & 2 BGBB).

The regulations result in the market for agricultural land being severely restricted. On the one hand, the circle of potential purchasers is heavily limited. On the other hand, price fixing is subject to state control – and relies on agricultural land use. All in all, this means that the land value of agricultural land is entirely determined by the agricultural sector – not by potential future development. Land speculation known from other countries regarding future building developments is mainly absent. Even if cantonal structure plans designate corresponding land as future development areas (art. 8 para. 1 lit. a SPA), the Peasant's Land Act prevents speculation.

3.2. Designated building land

The next formal planning phase is initiated by zoning (art. 15 SPA). According to Swiss law, basic building right is granted at this stage, even if further steps are necessary until the site is ready for a building permit (art. 22 SPA) (Aemisegger et al., 2016; Griffel, 2017). From then on, the owner has the right to use their land for construction if no public interests are opposed (Aemisegger et al., 2016).

Transferring a specific plot of land from the non-buildable to the buildable zone is referred to as *zoning* and requires a change in the plot's allocation in the zoning plan (art. 15 para. 4 SPA). Since this regulation is binding for everyone and equals a law, this decision must be presented to the electorate for approval.

In the Swiss planning system, zoning marks the highest increase in value. The scope of this increase is difficult to estimate because land value data is not publicly available in Switzerland. It can be assumed that including land in the buildable zone increases its value from 5 to 10 CHF/m^2 (for agricultural land) to between 300 CHF/m^2 in less attractive regions to more than 5000 CHF/m^2 in the most attractive regions (for comparable values see Müller-Jentsch, 2013, p. 7).

3.3. Suitable designated building land

Land readjustment marks the following planning phase (art. 20 SPA). This step is intended to ensure that plots of land are arranged according to their future land use. A building permit can only be issued if each plot of land is serviced (Art. 22 para. 2 lit. b SPA). Due to the change from agricultural to residential building land, these development requirements change in plot layout. Readjusting takes these new requirements into account. In addition, the plot layouts are optimised regarding aspects of construction or aspects of marketing.

Cantonal laws regulate the exact procedure for building land readjustment, which differs accordingly. Planning law includes the possibility of land reallocation being ordered ex officio (Art. 20 SPA), i.e., against the will of the landowners. This occurs very rarely in Switzerland. More often, developers buy several parcels and do the readjustment in an internal procedure (Shahab and Viallon, 2021).

3.4. Serviced building plot

The following planning phase begins with servicing a plot of land. Land is considered serviced if there is sufficient transport access for the use in question and necessary water, energy, and sewage systems have been built (Art. 19 para. 1 SPA). Swiss planning law defines servicing as technical infrastructure only (Ruegg, 2022). The municipality must provide the servicing no later than 15 years after zoning (Art. 15 para. 4 lit. B SPA).

Usually, municipalities issue a servicing programme that provides for staged servicing of all building plots within the zoning plan's 15-year planning horizon. The stages provided in this programme determine the land value within this planning phase. The closer to the expected date of full servicing by the municipality, the sooner the land's valorisation and thus the higher the land value – which is represented in our model by the price range within a phase (ascending line).

3.5. Serviced building plot (fee settled)

The following planning phase is initiated by paying the servicing charge, called 'landowner's contribution'. The charges for servicing vary depending on cantonal legislation. It is usually up to 50% of the actual costs for ordinary projects (see e.g., BSG 732.123.44, 2017). In the case of large projects, an infrastructure contract is usually concluded, containing the exact technical details and the cost allocation (Lambelet and Viallon, 2019). The land value depends on whether this service fee has been paid or is still outstanding. Paying the charge causes a further increase in land values.

3.6. Developable building plot

The building permit initiates the next and final planning phase. Having addressed zoning, land readjustment and servicing, our analysis of planning phases ends with issuing a building permit. Swiss planning law defines that a building permit must be granted if the land is serviced and the building project complies with the legal provisions of its zone (Art. 22 para. 2 SPA). No other conditions can be imposed. This means the landowner is entitled to a building permit when these conditions are satisfied. Accordingly, the increase in land values at this stage is comparatively insignificant (Perren, 2004). Usually, developers have three years to complete construction before the permit expires (see, e.g., art. 42 para. 2 Bau/BE).

4. Redistributive mechanisms in the Swiss planning regime

Changes in land value occur in the transition between planning phases. Bonczek's planning phase model illustrates these steps, making it possible to identify how value changes are dealt with politically and legally (see Fig. 3). One can consider both value increases (from left to right) and decreases (from right to left).

Land value changes are a recurring subject of political and academic debates and planning literature. In the realm of planning literature, various viewpoints emerge, including advocating for the complete capture of land value (Bernoulli, 1946), of planning-related added values (Halleux et al., 2022) and compensation for value losses, such as in cases of regulatory takings (Alterman, 2010). Applied to the Swiss planning regime, two aspects are of particular relevance: (a) The most significant value change caused by changing the land's zoning and its redistributive instruments, and (b) the differences in value determination for expropriation between agricultural land versus zoned land.

4.1. Value changes due to zoning

As can be seen from the model, granting (or removing) development rights is associated with the most significant value change. It is initiated by zoning, hence the initial assignment of the land to the buildable zone (from left to right), as well as by de-zoning, hence the downgrading to the non-buildable zone. Accordingly, this stage is the most interesting. Switzerland is one of the countries that has enacted planning law rules in both directions here.

In Switzerland, this value change is particularly significant for two reasons:

1. The Peasant's Land Act restricts land speculation on agricultural land. This protection no longer applies as soon as the land is zoned.

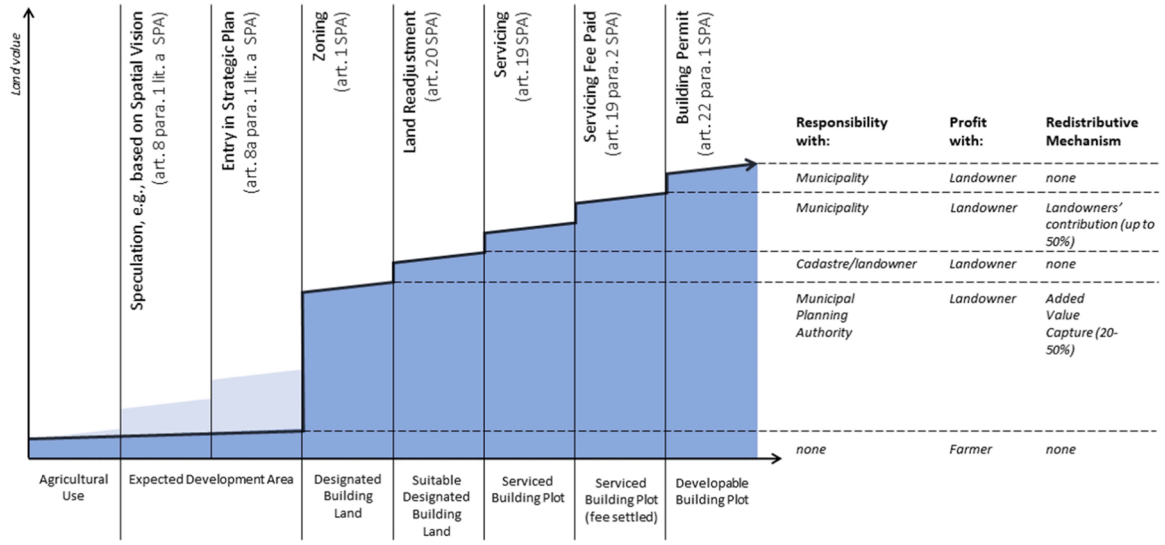

Fig. 3. Planning phases and redistributive mechanisms.

The value increase is particularly significant because the initial values are shallow.

2. Due to the regulatory planning system in Switzerland, building rights are generally already granted at the time of zoning. With the zoning, land values rise to a point close to the final values. The increase in value is significant because the values after the zoning are exceptionally high.

Since zoning causes significant value changes, it is not surprising that the Swiss planning regime has special rules for dealing with these changes. Both cases can be distinguished: Regulations on value increase in the case of zoning (from left to right) and regulations on value decrease in the case of de-zoning (from right to left).

4.1.1. *Redistributive regulations in the case of zoning*

Added value capture instrument has been incorporated into Swiss planning law since 1979 (Viallon, 2018) and was significantly enhanced in the 2012 Spatial Planning Act reform. Since then, at least 20% of the planning-related value increase will be captured (Art. 5 para. 1 SPA) (Hengstermann and Viallon, 2023). Exceptions may only be granted for minimal amounts for which the administrative effort needed is not in a reasonable proportion (Art. 5 para. 1quinquies SPA) or if public land is affected ('rob Peter to pay Paul') (Viallon, 2018). Planning law does not provide an upper limit, but 60% has become established as the maximum capture rate in planning practice in Switzerland since it was approved by the Federal Court (Hengstermann and Scheiwiller, 2021). Thus, part of the value increase, which is induced by changes in the legal quality of the land (and not, for example, to services provided by the landowner), is returned to the general public. In contrast to other international examples of a betterment tax of this kind (Alterman, 2011; Halleux et al., 2022; Muñoz Gielen and van der Krabben, 2019), Swiss capturing does not serve to finance specific infrastructure projects (Scheiwiller and Hengstermann, 2022). "Such a compensation [=added value capture] corresponds to a postulate of justice and, in particular, equality under the law: the changes in land value caused by public land use planning occur without the owner's involvement in the sense of his contribution or misconduct; this effect, which cannot be attributed to the owner, is to be neutralised to a certain extent." (Riva, 2016, p. 72 Authors' translation). Hence, the instrument's political narrative in Swiss politics aims to reduce injustice, namely the unearned increment of the landowner.

4.1.2. *Redistributive regulations in case of de-zoning*

If the land is deprived of its buildability, this is accompanied by considerable losses in value. This happens in the case of de-zoning or material expropriation ('regulatory takings'). Like most international planning laws (Alterman, 2010), Swiss law provides for compensation in this case. According to Art. 26 of the Federal Constitution, property is guaranteed and cannot be restricted unless compensation is granted. Art. 5 para. 3 SPA specifies that this compensation must be total.

Accordingly, the loss of value must also be determined for the case of de-zoning. The Swiss system provides court-hearing-like negotiations lead by a voluntary expert commission. However, the commission's task is not to determine a land value as objectively as possible (in the sense of finding the truth) but to negotiate a compromise between the parties' opposing interests (in the sense of out-of-court agreements). The land value thus arises because of arbitration and is based exclusively on the compromise of the two parties concerned in the individual case.

4.2. *Different value determination for expropriation*

Applying Bonczek's and Halstenberg's staircase to the Swiss planning regime reveals another peculiarity: the different handling of compensation for agricultural land versus zoned land in the case of expropriation. In principle, all three legal sources – the Federal Constitution (SC), the Spatial Planning Act (SPA) and the Expropriation Act (EA) – specify that expropriations must be *fully* compensated (art. 26 para. 2 SC, art. 5 SPA, art. 19 lit. a EA). However, since 2021, agricultural land is compensated at three times its market value (art. 19 lit. abis EA), whereas zoned land is to be compensated at its actual market value. This difference stems from a political demand by farmers' lobby organisations to adapt compensation mechanisms to more realistic market conditions. Initially, this entailed a demand for a six times greater value (Sibel et al., 2018).

This difference in compensation for agricultural land versus zoned land in cases of expropriation may appear as mere favouritism. However, a deeper understanding can be achieved with Bonczek's adapted staircase model. Due to the Peasant's Land Act regulations mentioned earlier, the value increase for expected future development land is left out. Accordingly, the values in this phase are pretty low compared to unregulated land markets, where development speculation already occurs on agricultural land. Since expropriation compensation takes the value before a planning measure as a reference point, Swiss farmers incur low absolute values. The triple compensation is, therefore, comparatively low in absolute values, as the base value in the staircase

model is low.

5. Discussion

Our results highlight interdependencies between planning phases, land value changes and the instruments that redistribute such planning gains and losses. We have illustrated that the planning phases in Switzerland differ from the original model. Of the resulting value increases, the first is more significant than foreseen in the model, while the remaining steps are more minor. Swiss planning instruments deal with the value changes caused by land use decisions.

5.1. Significant increase and significant response

The abrupt transition from agricultural to designated building land causes a sudden value increase, which, in Switzerland, is met by far-reaching regulations on how this profit is captured by the public sector or – in the reverse case – how the owner is compensated in the event of a transition back to non-buildable land. A possible explanation lies in the Swiss direct democratic system. Based on a pronounced understanding of justice, this system counteracts excessive preferential treatment of individuals (Hengstermann, 2021). The instrument of value capture then also enjoys the necessary legitimacy (Alterman, 2011) because the voting population has accepted it.

It is also possible that the generally high price difference between buildable and non-buildable land in Switzerland legitimises direct forms of value capture (Scheiwiller and Hengstermann, 2022). Similarly, other countries employ public value capture, especially in regions with high land prices (Kaufmann and Arnold, 2018; Vejchodská and Hendricks, 2023).

One must add that well-developed compensation schemes match the far-reaching value capture mechanisms in reaction to planning losses. In this way, redistributive mechanisms are justified by the fact that property owners should neither benefit excessively nor be disadvantaged by official state decisions. The model shows very clearly that this is particularly relevant for zoning. While in the other stages, value increases correspond to actual expenses (e.g., servicing), zoning-induced value changes are based purely on the legal quality of the land. Therefore, the political desire for equitable compensation would entail a symmetrical redistribution of unearned advantages and undeserved disadvantages. However, the system is asymmetrical. While 100% of planning losses are compensated, only 20–50% of planning gains are captured (Hengstermann and Viallon, 2023).

5.2. Swiss planning phases in international comparison

Our findings are fascinating compared to planning regimes in countries like Germany, where Bonczek's model was initially developed.

As described above, the absence of a phase of expected buildable land is a notable feature of the Swiss planning regime, distinguishing it from other planning regimes such as the British, Dutch or Belgian (Lacoere and Leinfelder, 2022; Shahab et al., 2021). We see a possible explanation for this in the high esteem in which agricultural land is held in Swiss politics and society (Ruegg and Letissier, 2015). In Swiss logic, the planning system and public intervention in property rights are legitimised by the goal of preventing urban sprawl, ultimately protecting agricultural production areas (Lendi, 2008). This attitude is rooted in the collective experience of the two world wars and is intended to ensure food supply during the war (Art. 104a SC; Art. 1 para. 2 lit. d & 16 SPA). In this sense, planning was initially subordinated to the Military Department (Lendi, 1996).

Compared to other countries with regulatory planning regimes (e.g., Germany), the significant value increase caused by zoning occurs early. Compared to Switzerland, German land value increases induced by the designation of land as development land in the municipal land use plan (*Flächennutzungsplan*) and the issuing of the detailed land-use plan (*Bebauungsplan*) cause less significant value increases (Hendricks et al., 2017). On the other hand, land readjustment has a more significant effect in Germany than in Switzerland. In Germany, land readjustment functions as the primary public value capture mechanism in the form of land shares and readjustment benefits (Hendricks, 2022). In Switzerland, by contrast, the most significant gains are already captured during zoning.

Compared to countries with a discretionary planning regime (e.g., the United Kingdom), the value increase provoked by issuing the building permit is minimal (Dembski et al., 2021; Muñoz Gielen and Tasan-Kok, 2010; Valtonen et al., 2017b). Despite special land use plans for projects or areas of exceptional importance, the Swiss regime leaves no room for negotiation at this point. Therefore, the land value is hardly affected. In the UK, on the other hand, the right to build is granted only in the context of building permit negotiation (Dembski and O'Brien, 2023). Therefore, the British system has a more extended phase of land speculation and a significant increase as part of issuing the building permit (Fowles et al., 2022).

Similarly, the Dutch planning regime knows extensive developer negotiations preceding the building permit (Hendricks et al., 2021). These negotiations can result in obligation and thus severely impact land values. In addition, land speculation occurs intensively before zoning – driven by private developers and the public sector (van der Krabben, 2021; van Oosten et al., 2018).

5.3. Importance of land value data

In general, planners should know land values and the impact of planning on land values as they play an essential role in the logic of owners and their behaviour. In concrete terms, however, the model also shows that at various points in the planning process, it is necessary to establish land values in a just and court-proof manner. For instance, the administrative decree on the amount to be paid regarding the added value capture depends on the difference between the land value before and after the zoning. Accordingly, it is important to determine both values. Likewise, it is essential to have accurate land values in the context of compensation for de-zoning and expropriation.

However, a public land value reference system like in Germany (Voß and Bannert, 2018) does not exist in most regions of Switzerland. Only 2 of the 26 cantons have such an instrument (Basel-Stadt and Zürich). The remaining cantons rely on private-sector appraisals, which allow market comparison values through systematic purchase price collections. However, the exact data basis and calculation methods are not published and are subject to corporate secrecy. This is questionable from the point of view of the state of law. One plausible explanation could be that Switzerland does not have a transparency culture, as in Scandinavia (Valtonen et al., 2017a), but has traditionally cultivated a high degree of bank-client confidentiality. As a neutral and stable country, the Swiss land market is one of the premium investment markets in global real estate portfolios (Falkenbach, 2009; Oikarinen and Falkenbach, 2017).

6. Conclusions

In this study, we have applied Bonczek's and Halstenberg's (1963) planning phase model to Switzerland. In contrast to previous studies, we transferred the model and adapted its phases to Swiss planning law. These revealed differences concerning both phases and value increases. Differences in planning phases are reflected in the scope of instruments that capture planning gains and compensate for planning losses. Since agricultural land prices are strictly regulated in Switzerland, transferring a plot into the buildable zone causes a comparatively high value increase. This planning gain is encountered by remarkably far-reaching value capture mechanisms.

Our findings shed light on the interdependence between planning phases defined in planning law, the resulting land value development and the instruments applied to deal with such value changes. The

planning phase model of Bonczek and Halstenberg has proven viable to illustrate these interdependencies and shows potential for its application in further cross-country comparisons. Further studies are needed that employ land value data to support our findings empirically. In addition, future studies could usefully explore mechanisms dealing with value changes induced by up- and re-zoning (such as brownfield development and densification) – processes that are gaining relevance in the continued effort to achieve compact urban development.

Our study has shown that knowledge of planning-related land value changes can help to understand redistributive mechanisms, thus providing an important contribution to best-practice debates. In general, planning practice and research must increasingly consider land values, because understanding the link between planning and land values is a prerequisite for making informed decisions about using and developing land responsibly and sustainably.

CRediT authorship contribution statement

Vera Götze: Conceptualization, Methodology, Writing – original draft, Writing – review & editing. **Andreas Hengstermann:** Conceptualization, Methodology, Writing – original draft, Writing – review & editing.

Declaration of Competing Interest

The authors have no conflicts of interest to declare.

Data availability

No data was used for the research described in the article.

References

Aemisegger, H., Moor, P., Ruch, A., Tschannen, P., 2016. Praxiskommentar RPG: Nutzungsplanung (Band 1). Schulthess, Zürich.

Ahlfeldt, G.M., Pietrostefani, E., 2019. The economic effects of density: a synthesis. J. Urban Econ. 111, 93–107. https://doi.org/10.1016/j.jue.2019.04.006.

Alterman, R., 2010. Takings International: A Comparative Perspective on Land Use Regulations and Compensation Rights. ABA Press, Chicago. https://doi.org/10.1080/14649357.2014.902907.

Alterman, R., 2011. Land-use regulations and property values: the "windfalls capture" idea revisited. In: Brooks, N., Donaghy, K., Knaap, G.-J. (Eds.), The Oxford Handbook on Urban Economics and Planning. Oxford University Press, Oxford, pp. 755–786. https://doi.org/10.1093/oxfordhb/9780195380620.013.0034.

Bernoulli, H., 1946. Die Stadt und ihr Boden, Verlag für Architektur, Erlenbach-Zürich.

Bonczek, W., Halstenberg, F., 1963. Bau-Boden: Bauleitplanung und Bodenpolitik. Systematische Darstellung des Bundesbaugesetzes. Hammonia-Verlag, Hamburg.

Braun, A., 1983. Raumplanung und bäuerliches Bodenrecht. Mensurat. Photogramm. Genie Rural 8.

BSG 732.123.44, 2017. Dekret über die Beiträge der Grundeigentümer an Erschliessungsanlagen und an weitere öffentliche Werke und Massnahmen (Grundeigentümerbeitragsdekret/GBD). Systematische Sammlung Kanton Bern (BSG).

Büchler, S., Ehrlich, M.V., 2023. Quantifying land-use regulation and its determinants. J. Econ. Geogr. https://doi.org/10.1093/jeg/lbad009.

Buitelaar, E., Sorel, N., 2010. Between the rule of law and the quest for control: Legal certainty in the Dutch planning system. Land Use Policy 27, 983–989. https://doi.org/10.1016/j.landusepol.2010.01.002.

Christensen, F.K., 2014. Understanding value changes in the urban development process and the impact of municipal planning. Land Use Policy 36. https://doi.org/10.1016/j.landusepol.2013.07.005.

Davy, B., 2018. Land market/land policy. In: Handwörterbuch Der Stadt- Und Raumordnung. ARL – Akademie für Raumentwicklung in der Leibniz-Gemeinschaft, Hannover, pp. 267–278.

Dembski, S., Sykes, O., Couch, C., Desjardins, X., Evers, D., Osterhage, F., Siedentop, S., Zimmermann, K., 2021. Reurbanisation and suburbia in Northwest Europe: a comparative perspective on spatial trends and policy approaches. Prog. Plann. 150, 100462 https://doi.org/10.1016/j.progress.2019.100462.

Dembski, S., O'Brien, P., 2023. The quest for certainty: Introducing zoning into a discretionary system in England and the European experience. Raumforschung und Raumordnung | Spatial Research and Planning. doi: 10.14512/rur.1695.

Dransfeld, E., Voß, W., 1993. Funktionsweise städtischer Bodenmärkte in Mitgliedstaaten der Europäischen Gemeinschaft: ein Systemvergleich. Bundesministerium für Raumordnung, Bauwesen und Städtebau, Bonn.

Falkenbach, H., 2009. Market selection for international real estate investments. Int. J. Strateg. Prop. Manag. 13, 299–308. https://doi.org/10.3846/1648-715X.2009.13.299-308.

Fowles, S., Manns, J., Vida, M., 2022. United Kingdom. In: Halleux, J.-M., Hendricks, A., Nordahl, B., Maliene, V. (Eds.), Public Value Capture of Increasing Property Values across Europe. vdf, Zürich, pp. 259–266. ⟨https://doi.org/10.3218/4147-7⟩.

FSO, 2022. Arealstatistik der Schweiz, Federal Statistical Office. Neuchâtel.

Gerber, J.-D., Gerber, J.F., 2017. Decommodification as a foundation for ecological economics. Ecol. Econ. 131, 551–556. https://doi.org/10.1016/j.ecolecon.2016.08.030.

Griffel, A., 2017. Raumplanungs- und Baurecht in a nutshell, 3. Auflage. ed. Dike Verlag AG, Zürich/St. Gallen.

Halleux, J.-M., Hendricks, A., Nordahl, B., Maliene, V., 2022. Public Value Capture of Increasing Property Values across Europe. vdf, Zürich. ⟨https://doi.org/10.3218/4147-7⟩.

Hendricks, A., Lacoere, P., van der Krabben, E., Oorschot, C., 2021. Limits of negotiable developer obligations. Sustainability 13. https://doi.org/10.3390/su132011364.

Hendricks, A., 2022. Germany. In: Halleux, J.-M., Hendricks, A., Nordahl, B., Maliene, V. (Eds.), Public Value Capture of Increasing Property Values across Europe. vdf, Zürich, pp. 105–111. ⟨https://doi.org/10.3218/4147-7⟩.

Hendricks, A., Kalbro, T., Llorente, M., Vilmin, T., Weitkamp, A., 2017. Public value capture of increasing property values – what are the "unearned increments"? In: Erwin Hepperle, Dixon-Gough, R., Mansberger, R., Paulsson, J., Hernik, J., Kalbro, T. (Eds.), Land Ownership and Land Use Development. vdf, Zürich, pp. 257–281. ⟨https://doi.org/10.3218/3804-0⟩.

Hengstermann, A., 2021. Switzerland, ARL International – Country Profiles. https://doi.org/10.5281/zenodo.5910027.

Hengstermann, A., Scheiwiller, L., 2021. Ausgleich planungsbedingter Mehrwerte - Analyse der aktuellen Ausgestaltung im kantonalen Recht vor dem Hintergrund der bundesrechtlichen Genese. UPR Umw. Plan. 41, 85–91. https://doi.org/10.48350/153968.

Hengstermann, A., Viallon, F.-X., 2023. Something between 20 and 50 per cent: understanding heterogeneous implementation of added value capture in Switzerland. Town Plan. Rev. 94, 149–172. https://doi.org/10.3828/tpr.2021.38.

Hong, Yu-Hung, Brubaker, D., 2006. Integrating the proposed property tax with the public leasehold sysem. In: Man, J.Y., Hong, Y.-H. (Eds.), China's Local Public Finance in Transition. Lincoln Institute of Land Policy, Cambridge, pp. 165–187.

Huang, H., Tang, Y., 2012. Residential land use regulation and the US housing price cycle between 2000 and 2009. J. Urban Econ. 71, 93–99. https://doi.org/10.1016/j.jue.2011.08.001.

Ihlanfeldt, K.R., 2007. The effect of land use regulation on housing and land prices. J. Urban Econ. 61, 420–435. https://doi.org/10.1016/j.jue.2006.09.003.

Jaeger, W.K., 2006. The effects of land use regulations on property values. Environ. Law 36, 105–130.

Jalali, D., MacDonald, H., Fini, A.A.F., Shi, S., 2022. Effects of planning regulations on housing and land markets: a system dynamics modeling approach. Cities 126, 103670. https://doi.org/10.1016/j.cities.2022.103670.

Kalbro, T., Mattsson, H., 2018. Urban Land and Property Markets in Sweden, Urban Land and Property Markets in Sweden. Routledge, London. https://doi.org/10.4324/9781351035903.

Kaufmann, D., Arnold, T., 2018. Strategies of cities in globalised interurban competition: the locational policies framework. Urban Stud. 55, 2703–2720. https://doi.org/10.1177/0042098017707922.

Lacoere, P., Leinfelder, H., 2022. Land oversupply. How rigid land-use planning and legal certainty hinder new policy for Flanders. Eur. Plan. Stud. 1–23. https://doi.org/10.1080/09654313.2022.2148456.

Lacoere, P., Hengstermann, A., Jehling, M., Hartmann, T., 2023. Compensating downzoning. A comparative analysis of european compensation schemes in the light of net land neutrality. Plan. Theory Pract. 24, 190–206. https://doi.org/10.1080/14649357.2023.2190152.

Lambelet, S., Viallon, F.X., 2019. The influence of politicization on the implementation of developer obligations in a federalist country. In: Muñoz Gielen, D., van der Krabben, E. (Eds.), Public Infrastructure, Private Finance - Developer Obligations and Responsibilities. Routledge, Abingdon, Oxon, pp. 100–110. ⟨https://doi.org/10.4324/9781351129169-9⟩.

Lendi, M., 1996. Zur Geschichte der Raumplanung in der Schweiz. disP Plan. Rev. 32 (127), 24–26. https://doi.org/10.1080/02513625.1996.10556622.

Lendi, M., 2008. Raumplanung — ihr politischer Stellenwert in einer veränderten Welt. Raumforsch. Raumordn. Spat. Res. Plan. 66 (5), 383–397. https://doi.org/10.1007/bf03183183.

Lin, D., Wachter, S.M., 2019. Land use regulation and housing prices. SSRN Electron. J. https://doi.org/10.2139/ssrn.3363947.

Müller-Jentsch, D., 2013. Führt die Teilrevision des RPG zu höheren Bodenpreisen? VLP-ASPAN InfoRaum 6–9.

Muñoz Gielen, D., Tasan-Kok, T., 2010. Flexibility in planning and the consequences for public-value capturing in UK, Spain and the Netherlands. Eur. Plan. Stud. 18, 1097–1131. https://doi.org/10.1080/09654311003744191.

Muñoz Gielen, D., van der Krabben, E., 2019. Public Infrastructure, Private Finance – Developer Obligations and Responsibilities. Routledge, Abingdon, Oxon. ⟨https://doi.org/10.4324/9781351129169⟩.

OECD (Organisation for Economic Co-operation and Development), 2022. Global Compendium of Land Value Capture Policies. OECD. ⟨https://doi.org/10.1787/4f9559ee-en⟩.

Oikarinen, E., Falkenbach, H., 2017. Foreign investors' influence on the real estate market capitalization rate – evidence from a small open economy. Appl. Econ. 49, 3141–3155. https://doi.org/10.1080/00036846.2016.1254343.

Perren, P., 2004. Gebührenerhebung im Baubewilligungsverfahren. Raum. Umw. VLP-ASPAN 41–52.
Riva, E., 2016. Art. 5 Ausgleich und Entschädigung / I. Einleitung. In: Aemisegger, H., Moor, P., Ruch, A., Tschannen, P. (Eds.), Praxis-Kommentar RPG: Nutzungsplanung. Zürich/Basel/Genf, pp. 63–78.
Rodas, J.M.C., Gómez, J.M.N., Castanho, R.A., Cabezas, J., 2018. Land valuation sustainable model of urban planning development: a case study in Badajoz, Spain. Sustainability 10. https://doi.org/10.3390/su10051450.
Ruegg, J., 2022. Switzerland. In: Halleux, J.-M., Hendricks, A., Nordahl, B., Maliene, V. (Eds.), Public Value Capture of Increasing Property Values across Europe. vdf Verlag, Zürich, pp. 111–116. ⟨https://doi.org/10.3218/4147-7⟩.
Ruegg, J., Letissier, F., 2015. Landscape as a Public Action Category? A Discussion Based on the Revision of the Swiss Planning Act. Geo-Regards.
Scheiwiller, L., Hengstermann, A., 2022. Ideologischer oder pragmatischer Mehrwertausgleich? Eine interkantonale Untersuchung zum Einfluss der politischen Legitimation auf die Ausgestaltung des Ausgleichs planungsbedingter Vorteile in der Schweiz. Raumforsch. Raumordn. Spat. Res. Plan. 80, 451–464. https://doi.org/10.14512/rur.154.
Shahab, S., Viallon, F.-X., 2021. Swiss land improvement syndicates: 'impure' Coasian solutions? Plan. Theory 20, 44–62. https://doi.org/10.1177/1473095220923629.
Shahab, S., Hartmann, T., Jonkman, A., 2021. Strategies of municipal land policies: housing development in Germany, Belgium, and Netherlands. Eur. Plan. Stud. 29, 1132–1150. https://doi.org/10.1080/09654313.2020.1817867.
Sibel, A., Sidney, K., Giovanni, M., Beat, R., Karl, V., 2018. Geschäft des Bundesrates - Bundesgesetz über die Enteignung. Änderung (18.057).
Valtonen, E., Falkenbach, H., van der Krabben, E., 2017a. Risk management in public land development projects: comparative case study in Finland, and the Netherlands. Land Use Policy 62, 246–257. https://doi.org/10.1016/j.landusepol.2016.12.016.
Valtonen, E., Falkenbach, H., Viitanen, K., 2017b. Development-led planning practices in a plan-led planning system: empirical evidence from Finland. Eur. Plan. Stud. 25, 1053–1075. https://doi.org/10.1080/09654313.2017.1301885.
van der Krabben, E., 2021. De werking van de grondmarkt. Autoriteit Consument en Markt, Den Haag.
van Oosten, T., Witte, P., Hartmann, T., 2018. Active land policy in small municipalities in the Netherlands: "we don't do it, unless….". Land Use Policy 77, 829–836. https://doi.org/10.1016/j.landusepol.2017.10.029.
Vejchodská, E., Hendricks, A., 2023. Munich's developer obligations as a legal transplant to the Czech institutional context. Town Plan. Rev. 94, 193–214. https://doi.org/10.3828/tpr.2021.28.
Viallon, F.X., 2018. Added value capturing in Switzerland: how much is enough? In: Gerber, J.-D., Hartmann, T., Hengstermann, A. (Eds.), Instruments of Land Policy: Dealing with Scarcity of Land. Routledge, 1 Edition. New York: Routledge, 2018. Series: Urban Planning and Environment, pp. 57–69. ⟨https://doi.org/10.4324/9781315511658-7⟩.
Voß, W., Bannert, J., 2018. Reference land values in Germany. In: Gerber, J.-D., Hartmann, T., Hengstermann, A. (Eds.), Instruments of Land Policy. Routledge, 1 Edition. New York: Routledge. Series: Urban Planning and Environment, pp. 35–48. ⟨https://doi.org/10.4324/9781315511658-4⟩.