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# Transferring Development Rights: Lessons and Suggestions from Switzerland

François-Xavier Viallon, Pierre-Henri Bombenger, Denis Leroy and Stéphane Nahrath

*François-Xavier Viallon* is a project manager at the Swiss Federal University for Vocational Education and Training. His research interests include policy instruments and value redistribution, natural resource management, property rights, and property governance.

*Pierre-Henri Bombenger* is a Professor of Urban and Regional Planning at the University of Applied Sciences Western Switzerland. His current research focus includes local adaptation processes of land use planning procedures.

*Denis Leroy* is a lecturer at the University of Applied Sciences Western Switzerland and a territorial engineer at the Spatial Development Office of Canton Vaud, Switzerland.

*Stéphane Nahrath* is a Professor of Public Policy at the Swiss Graduate School of Public Administration (IDHEAP) at the University of Lausanne. His areas of research include comparative public policy, land use planning and environmental policies, sustainable resource management, and circular economy.

**Abstract:** Land-use policies aim to control urban sprawl. Such control may involve different regulatory and market-based policy instruments, which compensate for and/or transfer development rights. In Switzerland, compensation for development rights has remained legally hazardous; discussions on the transfer of development rights have primarily considered *Transferable Development Rights (TDR)* as a means to transfer ill-placed development rights to more suitable areas. However, other instruments, such as *Land Improvement Syndicates (LIS)*, may prove more appropriate in the Swiss context. Drawing upon a literature review and attempts to conceptualise a new instrument, the present paper discusses theoretical and institutional characteristics of TDR and LIS. We review both instruments' capacity to fight urban sprawl and analyse their respective compatibility with the Swiss institutional setting. In an attempt to put forward the strengths and overcome the weaknesses of both instruments, we conceptualise a new instrument: *Multi-Site Land Improvement Syndicates (MSLIS)*. We discuss potentials and limits of MSLIS under the Swiss institutional setting, in particular, when transferring rights across jurisdictions. We conclude with lessons on re-locating development rights in a context of strong property rights, such as in Switzerland. In particular, we underline a) the different vehicles MSLIS offer for transferring rights, b) the specific decisional rules of the instrument, and c) its compatibility with legal obligations of compensation and the guarantee of property. These insights may be of interest to non-Swiss planning researchers and practitioners working on development rights re-location.

## 1 Introduction

The 2014 revision of the Federal Spatial Planning Act (FSPA) has clarified the general goal of the limitation of urban sprawl and green-field development by adding two more specific objectives: the re-zoning of oversized building zones and the definition of the location and size of building zones beyond communal bounda-

ries (art. 1 al. 1 let. a<sup>bis</sup> and art. 15 al. 2 and 3)<sup>1</sup>. The successful implementation of these two more specific goals requires specific policy instruments allowing for the transfer of development rights. Considering decisions of re-zoning, the Swiss planning regime (see Box 1) allows for the removal of building zones. However, authorities may have to pay compensation to the landowners for the land value losses that they have suffered. Financial compensation is due in the case of the court ruling re-zoning, i.e., the removal of development rights, as material expropriation (see Box 2). As compensation for material expropriation may be very costly, the 2014 FSPA introduced a mandatory tax on added land value (art. 5). The tax on added land value aims to collect funds from new zoning decisions, as well as, in some cantons, from the increase of building densities, and thus provide authorities with financial resources to pay for the aforementioned compensation, as well as general land infrastructure costs (see Box 3). Currently, the instrument shows three significant deficiencies. First, the tax has only been mandatory since 2014, although federal legislation has recognised the possible (i.e. non-mandatory) use of the instrument since 1980. Such late implementation requires the instrument to make up for decades of generous zoning policies in Swiss communes. As some of these oversized building zones have already been developed, making up for all zoning decisions is not always possible. Second, paying compensation for re-zoning decisions requires authorities to have substantial financial resources at their disposal to pay for compensation. These resources will only be available to authorities following new (additional) zoning decisions. This situation stands at odds with the FSPA, which prescribes cantonal and communal planning and building zones to be compliant with federal legislation within five years, i.e., since 2019. To secure implementation, the revised FSPA introduced a moratorium on new zoning decisions (art. 38a), applying as long as cantonal strategic plans are deemed non-compliant with federal legislation<sup>2</sup>. Third, in some cantons, the implementation of the tax has occurred at the communal level (Lambelet, Viallon 2019). As communes

Switzerland is a federal state composed of three governmental levels: the national level (Confederation), the cantons (member states), and the communes. While each level has specific competencies in planning, property rights on land are primarily defined at the national level. The national Parliament establishes planning principles through legislation and ordinances, as well as sectoral plans dedicated to specific purposes (military, electricity grid, transport, arable lands, nuclear waste, asylum). It also defines property rights on land and mortgage law in the Civil Code. Each canton then implements federal planning prescriptions in its own legislation. In particular, they define in their legislation planning instruments and procedures in greater detail. They also adopt a cantonal strategic plan to be approved by the Confederation. The latter analyses the current state of land use and defines planning goals for the next 25 years. Some cantons have additional legislation on property rights (e.g., common ownership). On the local level, communes define zoning plans and regulations, which grants them significant power over the value and uses of landed property rights. Nevertheless, zoning decisions have to comply with cantonal and federal laws and plans, such as zoning prescriptions, regulations on the size of building zones, or the tax on added land value (see Box 3). Re-zoning decisions may be conditioned to compensation of wronged landowners (see Box 2). Depending on cantonal legislation, communes may also be able to re-allocate property rights through land readjustments. Considering the effects of planning on land uses, the decentralised enforcement of planning policy has often allowed for subordinated authorities to interpret federal laws in a way that defends regional and local interests, sometimes even in contradiction with the initial will of federal authorities (Delley 1982; Rieder et al. 2014).

For a more exhaustive description of Swiss planning policy and property rights, see Knoepfel and Nahrath (2014).

Box 1: Swiss Planning Regime.

As opposed to formal expropriation, where landowners lose their property title, a material expropriation is due to public intervention, where the owners lose the ability to make economically valuable use of their property, for example, in the case of re-zoning. The Swiss Parliament left the thorny question of criteria for admitting material expropriation for the courts to decide. During the 1960s and 1970s, the Federal Supreme Court defined four criteria based on the case of Barret (1966):

- 1) There is a restriction of use rights, generally the right to development;
- 2) The restriction applies to land uses that will occur in the foreseeable future, i.e., landowners have to prove their intention to develop the land;
- 3) The plot is located in a building zone compliant with (cantonal) planning principles;
- 4) The plot is effectively constructible, i.e., it is connected to the sewerage system and does not require clearance or the adoption of a development plan.

For a more detailed explanation, see Nahrath (2003), Jomini (2008), Moor (1982, 2002), Riva (2009), VLP-ASPAN (2006, 2014). For more recent cases on material expropriation, see the rulings of the Federal Supreme Court numbers 1A.98/2000, 1A.73/2005, and 1A.211/2003.

Box 2: Material Expropriation in the Swiss Planning Regime.

The tax on added land value (art. 5 FSPA) is a planning instrument authorities use to zone and re-zone land as they see fit. It is mandatory only since 2014. By capturing windfall gains of landowners benefiting from financially favourable zoning decisions, it gives cantonal and/or communal authorities the means to compensate wronged landowners from whom they withdraw development rights (e.g., in the case of re-zoning). This redistributive mechanism is the cornerstone of the Swiss planning regime, as it links planning policy with the guarantee of property (Nahrath 2003). The 2014 FSPA defines a minimum taxation rate of 20% applying to all zoning decisions on undeveloped land.

For a more detailed explanation and empirical evidence on tax implementation, see Nahrath and Viallon (2016), Viallon (2017), Lambelet and Viallon (2019).

Box 3: Tax on Added Land Value in the Swiss Planning Regime.

collecting funds are not necessarily those required to re-zone land (ARE 2005), a discrepancy between communes appears, and the oversized zones cannot be reduced.

Considering now the objective of re-locating development rights, federal planning policy defines the previously described tax on added land value as the (sole) policy instrument for authorities to zone land as they see fit and leaves to the cantons the possibility of defining additional instruments. As mentioned in the previous paragraph, the late implementation of the tax on added land value, the absence of available financial resources, and the scale of instrument implementation make the tax inadequate to achieve the desired policy objective. Currently, the revised FSPA does not provide dedicated instruments to re-locate development rights. This lack of instrumentation is at odds with recent attempts of landowners to exchange development rights. The media have reported cases in different cantons of individuals eager to exchange development rights across communes (Bourgeois 2015; Francey 2017). In the literature, researchers in Switzerland have been discussing the issue of the re-location of development rights primarily within the lens of the instrument of Transferable Development Rights (TDR) (Süess, Gmünder 2005; Frey, Zimmermann 2005; Gmünder 2010; Menghini 2015). Commonly used in the USA (Pizor 1986; Machemer, Kaplowitz 2002; Kaplowitz, Machemer, Pruetz 2008; Linjous, Chapin 2014), this instrument allows for the large-scale re-location of development rights by creating a market for TDR credits between geographically distinct areas. As the instrument does not imply the withdrawal of rights, it may also prevent potential compensation claims, a salient issue in the Swiss planning regime. Another branch of literature studying the re-location of development rights in Switzerland focuses on the potentials of Land Improvement Syndicates (LIS) to transfer scattered development rights to areas most suited for development (Prélaç-Droux 2009; Weber et al. 2011; Viallon et al. 2017; Shahab, Viallon 2019). LIS incorporate land readjustments, zoning changes and infrastructure provisions within a single instrument. One of the goals pursued by the instrument is the preservation of agricultural lands and natural areas through the optimal re-location of development rights within a given area. The instrument works primarily on a small scale (up to hundreds of hectares). It does not withdraw rights from landowners, and potential compensation claims are low.

In an attempt to stimulate discussion on the re-location of development rights, the present paper discusses the strengths and weaknesses of TDR and LIS as means to re-locate development rights under the Swiss planning regime. In particular, it shows the “chiasmic” nature of the instruments’ characteristics (the strengths of the one correspond to the weaknesses of the other) and builds upon their respective strengths to suggest a new policy instrument of Multi-Site Land Improvement Syndicates (MSLIS). MSLIS are an innovative means to re-locate development rights and fight urban sprawl, particularly in planning regimes requiring compensation for the removal of development rights. To this end, we first present the methodology of the paper (section 2), then present the main characteristics of TDR (section 3) and LIS (section 4). We then discuss both instruments’ relevance to the achievement of 2014 FSPA objectives, and the challenges linked with their implementation in the Swiss context (section 5). We show that none of the instruments provides an optimal solution to the relocation of development rights. Based on the respective strengths and weaknesses of TDR and LIS, we suggest a new instrument, Multi-Site Land Improvement Syndicates (MSLIS) (section 6). MSLIS aim to transfer development rights between geographically distinct areas through the combination of land readjustment and zoning changes. We conclude with a summary of the instruments’ strengths and weaknesses and draw lessons from the analysis. In particular, we put forward questions of effectiveness, coordination among jurisdictions, and compatibility with strong legal protection of private property as in Switzerland.

## 2 Methodology

This paper uses a review of literature and administrative documents to assess the policy instruments considered. One purpose of the literature review is to document the policy goals of TDR programmes and LIS and show the relevance of their use to fight urban sprawl. We identify both instruments as being relevant to the Swiss context, both from the perspective of academic research and planning practitioners (Menghini 2015; Prélaç-Droux 2009; Courdesse 2014). The review also aims to describe the mechanisms and operational steps of instrument implementation. Building upon policy instrument research (Salamon 2002), we pay particular attention to vehicles and rules

for transferring rights (e.g., boundaries, transfer mechanisms, means of compensation, individual or collective decision-making rules), and delivery systems (e.g., auction platform, assembly, local planning regulations, jurisdictions, organisations involved). Further, the literature review provides information about the effects produced by instrument implementation and sums up the challenges linked to the successful implementation of TDR programmes and LIS. We draw particular attention to legal aspects and questions of financial compensation, as these are key elements of liberal regimes such as Switzerland (Knoepfel et al. 2007). Further, we identify the strengths and weaknesses of both instruments, and use them as a starting point for conceptualising a new policy instrument.

The conceptualisation of Multi-Site Land Improvement Syndicates (MSLIS) results from discussions and modelling work completed within the research project “Towards a more sustainable management of soil resources by redistribution of economic and ecological added and reduced values” (Nahrath et al. 2012). The research project offered an exchange platform for researchers and practitioners. Participating members first formulated possible scenarios for transferring development rights, e.g., greenfield development or densification, public and/or private land ownership, development rights for housing or industrial uses. Then, they identified chronological steps of instrument implementation (see Figure 4) and discussed conditions of successful instrument implementation from a theoretical and practical perspective. The main conditions subject to discussion were the financial feasibility of MSLIS, the acceptability of development-rights transfer by landowners in the receiving area, as well as the compatibility of such transfers with planning legislation and local regulations (see section 6).

Data collection included essentially secondary data. Researchers collected Swiss legislation relating to planning, LIS, and TDR. At the federal level, legislation comprised land and planning acts, such as the FSPA and related ordinances, the Federal Act on Rural Land Rights, and the Civil Code. At the cantonal level, legal data collection targeted regulations on LIS, as well as laws on planning and the cantonal strategic plan. As Canton Vaud is the only canton having implemented LIS so far, we limited the collection of cantonal legislation to this canton. Data collection also comprised court decisions on cases of compen-

sation related to the transfer of development rights, both in the USA and in Switzerland. These court decisions were used to analyse how jurisprudence in these two countries ruled the transfer of rights, and to discuss potential implications of TDR and MSLIS implementation in Switzerland. Further, the Spatial Planning Office of Canton Vaud furnished administrative documents on LIS to the authors, such as specific legal information on LIS, financial figures of executed LIS, land values, and comprehensive guidelines for instrument implementation (Schneider et al. 2003). In addition, researchers also collected primary data through eight interviews. These interviews contributed to the researchers’ comprehensive understanding of the functioning of LIS but were not directly used for the present research.

### 3 Transferable Development Rights (TDR)

#### 3.1 Objectives

TDR can be defined as the (potential) “sale of a preordained number of rights to develop one’s property in sending areas to buyers who would transfer those rights to receiving areas” (Nelson, Pruetz, Woodruff 2013: 5). The cap of the amount of surface dedicated to construction, i.e., the number of development rights, and their conversion into credits, aim to create a market where landowners trade these credits among themselves. Such trade aims to protect agricultural land, as in the case of Montgomery County, USA (Renard 2007; Gmünder 2010), to protect ecological areas and landscape, in the case of Praz de Lys, France (Renard 2007), or to protect historical sites, such as Penn Central in New York City, USA (Aoki et al. 2005; Renard 2007; Brinkley, Machemer 2012). The legal basis of TDR programmes varies among cases; they can be rooted in state legislation or be defined by local jurisdictions such as counties (Johnston, Madison 1997).

#### 3.2 Mechanism

Authorities must designate an organisation responsible for the use and surveillance of the instrument. The organisation usually operates in a single jurisdiction – the county in the US. Its core tasks are the definition of the geographic boundaries for sending and receiving areas, the organisation of the acquisition and sale of credits (i.e., the ‘development right bonds’ to be traded), the surveillance of the exchange of

such credits, and the inscription of subsequent property changes (use restrictions, property rights acquisition) into the land registry (Brinkley, Machemer 2012). The lead organisation defines a maximum amount of gross floor area available (the cap) for construction in a defined area. The cap is set independently of potential zoning decisions, although it limits the overall amount of constructible floor within the instrument's boundaries. When defining the geographic boundaries of implementation, the organisation in charge can, depending on the objectives to be achieved, define a single urban area within which credits are traded (e.g., for the protection of historical monuments, such as in the case of Penn Central Station in New York City), or distinguish sending and receiving areas. These areas may be rural, or rural and urban (e.g., when the purpose is to protect unbuilt land) (see Linkous, Chapin 2014).

Figure 1 illustrates property and zoning changes before and after implementation of a TDR programme intending to re-locate development rights from peri-urban to urban areas. For purposes of clarification, it solely displays property and zoning changes. At  $T_0$ , landowners exchange development credits for financial payments through a trading platform (e.g., an auction system). The number of credits allocated and the number of landowners or developers in the receiving area seeking to acquire additional rights and their willingness to pay for these rights determine the credit price. TDR programmes reduce zoning den-

sities in sending areas and instead distribute credits to landowners. In receiving areas, zoning densities are increased, but their use is conditioned to the acquisition of credits. In voluntary TDR programmes, landowners in the sending area can either sell their credits to landowners in the receiving area or use them to develop. In mandatory programmes, landowners in the sending area can only sell their credits to landowners in the receiving area, or must purchase a legal access to land (e.g. land property title or a share in a condominium) in the receiving area in order to realise/concretise their development rights. At  $T+1$ , landowners use the acquired credit(s) for development. If there is demand for development in urban (receiving) areas, landowners in the receiving area may have acquired credits to increase development possibilities. In the sending areas, landowners may have redeemed their credit, or used it for development (e.g., in voluntary TDR programmes).

### 3.3 Conditions of Implementation

One condition for instrument functionality is the careful collection and mobilisation of local knowledge on the geographic boundaries, in particular, the localisation of “development demands and patterns in order to appropriately locate sending and receiving sites” (Machemer, Kaplowitz 2002: 786). Such knowledge includes the predominant type of housing, the densities already granted by zoning regulations, the availability of undeveloped land, existing infrastructure, and available land service. Another condition is the definition of the size of sending and receiving areas. TDR programmes that aim to protect land from urban sprawl require the definition of large areas in accordance with regional planning considerations, possibly on a functional scale; these areas must include differentiated land markets, susceptible to the occurrence of rights transfers (Gmünder 2010: 202). A large receiving area limits political contestation of localised densification projects (Gmünder 2010: 200); it also includes more potential credit buyers, which strengthens the demand for TDRs. However, large receiving areas can also limit the effectiveness of sprawl reduction. Authorities may also (unintentionally) define competing processes for granting additional density to landowners within receiving areas, such as additional development bonuses, or a bypass of regulations on parking and open spaces. In case of absence of coordination with TDR programmes, such processes may reduce

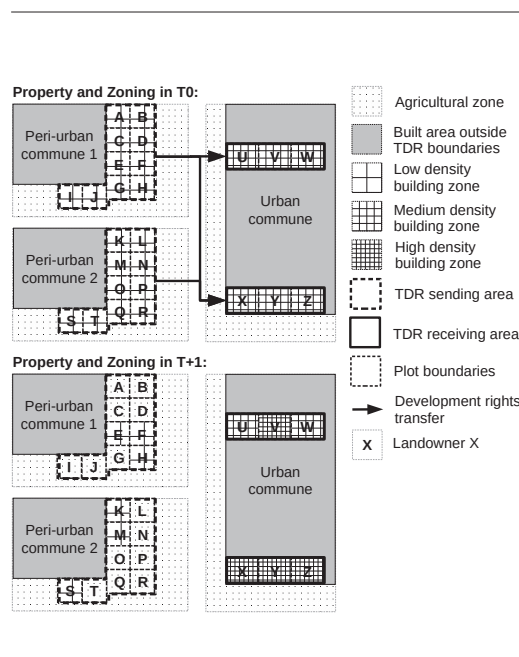


Fig. 1: Property and Zoning Changes within Transferable Development Rights Programmes. (Source: Own representation)

TDR performance. In case of coordination with TDR programmes, these additional derogations to zoning prescriptions may increase TDR acceptance (Brinkley, Machemer 2012). Further, TDR literature emphasises the importance of landowner trust in the instrument in order to ensure its functioning. Education processes, as well as intermediaries such as a trading platform, a public purchase programme, a bank, or a buyer of last resort who buys credits in the absence of demand, can play a decisive role (Machemer, Kaplowitz 2002; Kaplowitz et al. 2008). These intermediaries also contribute to the reduction of TDR credit price variations (Gmünder 2010: 200).

### 3.4 Legal Compatibility and Political Acceptability in the USA and Switzerland

The legal definition of TDR impacts possible claims for compensation made by landowners in sending and receiving areas. In the USA, the US Supreme Court considers TDR as “administrative contrivances intended to mitigate the impact of government regulations, and thus distinct from the rights inherent in landownership” (Brinkley, Machemer 2012: 113). In such cases, the attribution of TDR to a plot may act as a compensation for economic losses resulting from the removal of development rights and thus prevent a ‘taking’, i.e., a legal recognition of material expropriation. In fact, it enables the transfer of economic uses. These uses must be re-attached to a particular parcel, or purchased, to be effectively valued. Therefore, TDR mitigate the financial burdens imposed on the landowner through legal restrictions. As put by Renard, they function as a compensation mechanism for land-use restrictions imposed by zoning, and thus as a means to “make zoning more ‘acceptable’” (Renard 2007: 44). In other words, TDR may prevent the legal recognition of a ‘taking’, instead of compensating for it (Aoki et al. 2005).

In Switzerland, jurisprudence considers the removal of a right to develop one’s plot a severe restriction to property, which may be considered equivalent to an expropriation, and therefore subject to full compensation (see Box 2). Considering such situations, and in the hypothetical situation of a Swiss TDR programme, two challenges appear. First, in the receiving area, the acquisition of TDR as an additional condition for obtaining a building permit could be ruled a form of material expropriation, as it would potentially impose a severe restriction on property. However, such restriction would

be primarily financial. Financial burdens on the use of development rights exist in Swiss legislation. Policy instruments, such as the tax on added land value, or the extended land service tax (see Lambelet, Viallon 2019), oblige landowners to pay for the use of development rights. Therefore, as long as the amount to be paid for TDR allows for their economic use, i.e., an increase of wealth from the property<sup>3</sup>, a court ruling a material expropriation seems *a priori* unlikely. Nevertheless, existing taxes might reduce buyer propensity for acquiring TDR credits. Second, in the sending area, there is a risk that TDR would be ruled incompatible with the guarantee of property. According to the Barret formula (see Box 2), restrictions of use rights, such as the right to development, are, under specific conditions, incompatible with the guarantee of property. Therefore, as opposed to the mitigation function of TDR recognised by court rulings in the USA, TDR would, in the Swiss case, act as a compensation for material expropriation only if they fully compensate the landowner for their economic loss resulting from changes in zoning. If TDR do not provide full compensation (i.e., the whole price difference between the building and non building zone), authorities may be obligated to fill the missing amount. Further, the definition of credit prices would not operate according to supply and demand on a TDR market anymore. The successful implementation of TDR in Switzerland is thus bound to the resolution of this issue.

Regarding the definition of the geographic boundaries, linking sending and receiving areas at a functional scale can challenge both institutional boundaries and the governmental levels in charge of implementing TDR and zoning regulations (see Skuzinsky, Linkous 2018). To limit the challenges of institutional boundaries, Swiss TDR programmes could be defined within single cantons. However, such programmes would lose a substantial part of their potential, as oversized building zones are unequally distributed among cantons (ARE 2005). As the federal government only has the competency to edict planning principles, introducing a TDR programme across cantons would first require the creation of an inter-cantonal governing body responsible for programme supervision. Such a governing body would bring together the planning ministers of the cantons participating in the programme. The body would first define the geographic boundaries of the instrument, and make sure cantonal building zone quotas defined by the federal govern-

ment would be met. Second, the financial consequences of transferring development rights would impact the fiscal equalisation among cantons. Therefore, the body would also need to estimate fiscal costs and gains of these transfers and suggest compensatory measures. Third, instrument implementation would require coordination between cantons and communes. Communes would have to implement instrument boundaries into their zoning regulations, as they have zoning competency. Each canton would then approve these changes, ideally within a short time span. As zoning plan revisions are fundamentally political decisions occurring within democratic decision processes, it is not unusual that they take months or even years to be adopted.

From an institutional perspective, the high degree of decentralisation of land-use planning and fiscal policies in Switzerland (Wälti 2003; Knoepfel, Nahrath 2014), and the role of local and regional interests in the implementation process (Rieder et al. 2014), pose broader hurdles to a spatially encompassing TDR programme. Its implementation would call into question several decades of decentralised land-use planning policy implementation, and the fundamental principle of communal autonomy. In fact, the zoning competency of communes and their definitions of urban densities would be challenged by potential zoning moratoria in sending areas, and the imposition of minimal densities in receiving areas<sup>4</sup>. Further, in cases where the number of credits is less than the number of building zones, a situation that occurs in the absence of a zoning moratorium during the implementation of TDR, the delivery of building permits might require supra-communal arbitration, as the number of credits available for development would be less than the number of development rights granted through zoning. TDR pose an additional challenge to communal autonomy and fiscal competition. From the perspective of authorities, the creation of building zones induces added land value and attracts new residents along with fiscal revenues (Segessemann, Crevoisier 2016). The transfer of development rights outside of the territory counteracts this strategy by relocating expected revenues elsewhere. A high degree of opposition to TDR by the peri-urban communes<sup>5</sup> is reasonably expected.

Another element emphasised in the literature is instrument acceptance. Landowners' initial lack of knowledge regarding instrument functionality, and uncertainties in terms

of financial effects, can generate mistrust in TDR programmes (Machemer, Kaplowitz 2002; Süess, Gmünder 2005; Gmünder 2010; Shahab et al. 2019). Previously mentioned intermediaries such as banks, or a public budget line dedicated to the acquisition of credits, combined with communication campaigns to explain the mechanism of TDR, can help to bolster instrument acceptance.

### 3.5 Advantages and Disadvantages

Scholars have attempted to analyse changes achieved by TDR programmes, for example, in terms of the number of TDR exchanged, or the surface area of land placed under protection (Machemer, Kaplowitz 2002; Pruetz, Standridge 2008). They observe that vast amounts of land have been placed under protection, and the instrument's contribution to both planning and ecological objectives (Klapowitz et al. 2008). The 20 most successful TDR programmes in the USA individually preserved between 900 and 37 000 ha (Pruetz, Standridge 2008)<sup>6</sup>. The instrument also reduces the windfall gains and wipe-out losses induced by planning decisions, as it redistributes land values among landowners targeted by planning decisions (Brinkley, Machemer 2012). Further, the voluntary participation of landowners and the private resolution of zoning discrepancies are evidence of the instrument's high flexibility (Aoki et al. 2005). In terms of disadvantages, in addition to the material expropriation issues discussed above, the insufficient coordination with zoning plans, and the voluntary nature of landowner participation, are potential limits to the number of rights to be transferred, and can induce undesirable development outcomes, such as additional urban sprawl (Linkous, Chapin 2014). Also, zoning exceptions created by TDR programmes increase the risk that TDR become an end in themselves and induce additional derogations to zoning regulations, rather than contributing to the achievement of quality urban development (Renard 2007; Brinkley, Machemer 2012). Other elements are administrative costs linked to the definition of zones, the configuration of the trading platform, and the involvement of the targeted landowners (Shahab et al. 2019). Further, in Switzerland, the question of institutional boundaries and the discrepancy between required policy competencies and the governmental level also constitute potential hurdles for adoption (Süess, Gmünder 2005; Menghini et al. 2015).



## 4 Land Improvement Syndicates (LIS)

### 4.1 Objectives

Adapted from rural land betterments that transformed the size and shape of land plots to make them more suitable for agricultural machinery in the 1960s (Courdesse 2014), Land Improvement Syndicates (LIS) are an urban land readjustment tool that incorporates land readjustment, zoning changes and infrastructure provision within a single instrument. LIS aim to implement land-use planning objectives such as the economic use of soil, clear separation between constructible and non-constructible areas, protection of agricultural land, and prevention of land hoarding (Weber et al. 2011; Viallon 2017; Shahab, Viallon 2019). The FSPA states that if required by zoning plans, land readjustment can be prescribed, and, if necessary, executed by authorities<sup>7</sup>. In Canton Vaud, where the tool was developed and implemented since the 1980s, the Spatial Planning and Constructions Act and the Land Betterment Act prescribe the mandatory coordination of zoning and land readjustment<sup>8</sup>.

### 4.2 Mechanism

Each syndicate consists of an ad hoc public corporation created by a majority of the landowners within LIS boundaries. In cases where there is a public interest (construction of a road, future public domain), the supervisory authority can also decide upon the creation of a mandatory syndicate and set its area regardless of the landowners' decision. LIS are composed of a landowner assembly, a steering committee, and an expert committee. The landowner assembly votes on the syndicate area, new property shapes and boundaries, as well as land values before and after zoning changes. Decisions are made by the majority of landowners, and each landowner is entitled to one vote. The landowner assembly also elects both committees. The steering committee executes assembly decisions, such as making payments, issuing invoices, and negotiating and contracting with lenders. The expert committee advises the assembly on the future state of the land. It is composed of a notary, real estate expert, geometer and, in some cases, of a planner. It suggests changes to property shapes and boundaries to the assembly, estimates land values before and after zoning changes, and ensures that claims of landowners are met in an equitable manner.

To meet landowner claims, the expert committee conducts two land value assessments. First, the committee assesses the individual value of all plots within the syndicate boundaries under existing zoning regulations. The results allow for determining the share of land value held by each landowner member of the syndicate. Then, the committee assesses the syndicate area as a whole under the new development plan. Dividing the new value of the entire area by the prior value of all landowners' plots results in a profit coefficient. The profit coefficient is used to determine landowners' individual claims under the new development plan, as well as their proportionate share of costs (e.g., payment of committee members, infrastructure provision, compensation among landowners). Depending on individual preferences, the expert committee suggests meeting landowners' value claims in three ways: a) square metres of gross floor area under the new development plan, b) financial compensation, e.g., in exchange for the cession of development rights to another landowner, or if the landowner has few claims, c) a compensation in kind, i.e., through additional land surfaces. Compensations in kind occur, for example, where a portion of land is not being developed and a landowning farmer wants to cultivate it (landowner C in Figure 2).

To make sure the new property shapes and boundaries fit with the development plan, the expert committee acts as a broker between the assembly and communal authorities, who de-

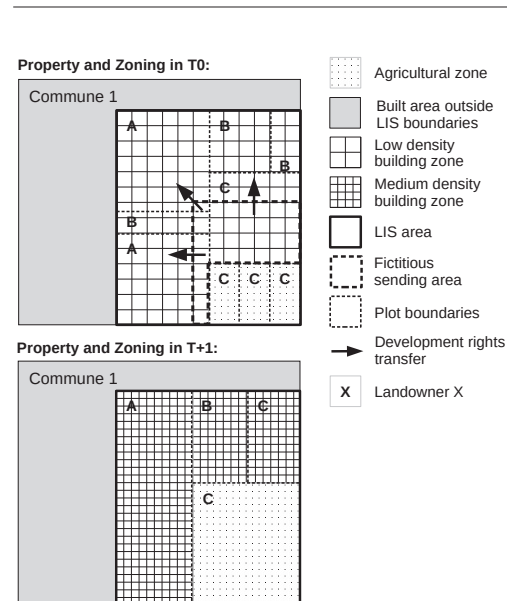


Fig. 2: Property and Zoning Changes within Land Improvement Syndicates.  
(Source: Own representation)

fine and adopt the development plan applying to the syndicate. Communal zoning regulations are guidelines for defining the densities of the development plan. In executed LIS, the development plan always allowed for a substantial added land value between old and new land uses (profit coefficient  $> 1.5$ ). Once landowners agree upon the allocation of land and compensatory payments, they vote on the change of property boundaries, and the commune votes on the development plan. Finally, in its function as the supervisory authority, the canton's planning department approves both the development plan and the property boundaries. Figure 2 shows the state of property and zoning before (To) and after (Ti) syndicate execution.

#### 4.3 Conditions of Implementation

The main condition of implementation of LIS is the allocation of additional development rights through zoning within instrument boundaries. These additional development rights allow for the definition of higher densities in one area, and, simultaneously, the re-zoning of other areas. The added land value of these development rights produces substantial gains for all landowners and may also pay for infrastructure provision (see 4.2. on possible forms of compensation). To ensure the agreement of most landowners with the suggested changes, experts designated by landowners and/or communal authorities conduct a feasibility study prior to the creation of the syndicate. The feasibility study consists of preparing a draft of possible property boundaries and zoning changes, receiving landowner inputs, evaluating alternative solutions, and finally selecting the option preferred by most participants. This step also contributes to increasing the credibility of the project and familiarising landowners with the policy instrument (Shahab, Viallon 2019). Then, landowner agreement also plays a central role, because each landowner has the right to oppose the assembly's decisions. In case of opposition, the expert committee deals with them first. In cases where their decision is contested, the matter is brought to court. Such situations can prolong the procedure for several years<sup>9</sup>. Notwithstanding this opposition right by individual landowners, the LIS majoritarian decision rule, combined with the creation of substantial collective added value, constitutes an effective approach to the implementation of LIS decisions. Indeed, LIS provide very powerful incentives to landowners and communes: they generally

grant additional development rights to landowners, release farmland for farmers, and the commune benefits from reduced planning and land-service costs, as (part of) these are carried by the syndicate. One factor easing the implementation of LIS is the diversity of preferences of landowners. For example, if all landowners want only land for development, the agricultural surfaces put under protection may not find a purchaser. If one landowner privileges financial compensation over land for development, other landowners may have to make high financial payments. Practice has shown that for LIS implemented at the boundaries of urban development, having at least one farming landowner who is a member of the syndicate eases the settlement of landowner claims.

#### 4.4 Legal Compatibility and Political Acceptability

In terms of the Civil Code, the syndicate's intervention in the property structure and in the re-allocation of land property correspond to an expropriation. In order to enable the instrument's functionality, legislation on land betterment excludes the application of expropriation law within LIS boundaries<sup>10</sup>. However, the equal treatment of landowners needs to be guaranteed, as otherwise opposition to LIS decisions might be successfully challenged in court (see section 4.3). As mentioned in section 4.2, the equal treatment of landowners is guaranteed by distribution of the added land value proportionate to the land value initially owned by each of them. Within broad LIS areas involving numerous landowners, the heterogeneity of the plots valued is greater, and there is an increased likelihood that landowners may contest their respective land valuations. Therefore, land valuation, as well as interpersonal relations, plays a core role in the acceptance of LIS.

#### 4.5 Advantages and Disadvantages

From a planning perspective, the essential effect of LIS lies in the optimisation of the surfaces intended for urbanisation. As noted by Weber et al. (2011), the instrument resolves property-related aspects such as inappropriate plot shapes and boundaries, lack of access, or pre-existing easements, and provides a legal, financial, and physical guarantee of the land's constructability. Further, it contributes to the protection of agricultural or natural areas, because surfaces previously zoned as constructible can be re-zoned non-constructible, con-

centrating the development on a smaller land surface. The syndicate can also be used as a means of tackling land hoarding. In fact, landowners have to pay for LIS to function (e.g., payment of the contracted experts), and the land-service costs that arise once the property and zoning changes are made. This renders landownership costly and constitutes an incentive for landowners to develop or sell their property (Zuppingner 1986). These costs, along with the length and complexity of the procedure, can also induce eviction of landowners, e.g., those with a small property might sell at an intermediate price<sup>11</sup> prior to the creation of the syndicate, which reduces the number of participants and facilitates decisional processes (Viallon 2017; Shahab, Viallon 2019). The syndicate’s strength also resides in its capacity to borrow money. Using future land values as collateral, the landowner assembly can finance infrastructure provision, and sometimes

even a portion of land development, through a mortgage on the plots. Finally, a high degree of transparency is achieved, as syndicate accounting is subject to public scrutiny. At last, the main weakness of LIS consists in its very limited sociospatial perimeter, which does not allow for transfers at a larger (functional) scale, i.e. between peri-urban and urban regions.

### 5 Instrument Contribution to Spatial Planning Objectives

The current section summarises the core characteristics of TDR and LIS (see Table 1). We put forward the “chiasmic” nature of both instruments and discuss their potential contribution to fighting urban sprawl. In particular, we discuss questions related to property rights and political institutions from the perspective of their implementation in Switzerland.

	Transferable Development Rights	Land Improvement Syndicates
Instrument type	Policy-driven, incentive-based, cap and trade	Property and policy-driven, (self-) regulatory based
Objectives	Protection of agricultural land and natural areas, of landscape and historical sites	Rationalisation of planning, protection of agricultural land and natural areas, fight against hoarding of building land
Mechanism	<ul style="list-style-type: none"> <li>• Administration defines geographic boundaries, manages credits and their trading</li> <li>• Individual decision-making on rights transfer</li> </ul>	<ul style="list-style-type: none"> <li>• Landowners decide upon LIS creation, plot shapes and boundaries</li> <li>• Collective decision-making on rights transfer</li> <li>• Municipality defines zoning regulations</li> </ul>
Conditions of implementation	<ul style="list-style-type: none"> <li>• Large scale (county), thousands of hectares</li> <li>• Thousands of landowners</li> <li>• (Possibility of) geographically distinct areas</li> </ul>	<ul style="list-style-type: none"> <li>• Small scale (municipality), hundreds of hectares</li> <li>• Dozens of landowners</li> <li>• Geographically contiguous area</li> </ul>
	<ul style="list-style-type: none"> <li>• Possible derogations to zoning regulations / Definition of ad hoc development plan</li> <li>• Education of landowners and public to increase trust</li> <li>• Demand for development</li> </ul>	
Legal compatibility and political acceptability	Implementation within single jurisdictions	<ul style="list-style-type: none"> <li>• Added land values shared equitably among landowners</li> <li>• Potential opposition from landowners</li> </ul>
	In the case of implementation in Switzerland: <ul style="list-style-type: none"> <li>• Question of compatibility with with the guarantee of land ownership (material expropriation)</li> <li>• Synchronisation of municipal zoning plan revisions</li> </ul>	
Redistributive effects	<p>Ecological: Limitation of overall surface dedicated to urbanisation</p> <p>Economic: New development rights (and development bonuses) granted induce higher land values</p>	

Tab. 1: Main Characteristics of Transferable Development Rights and Land Improvement Syndicates.

TDR and LIS are two policy-driven instruments that allow for re-locating development rights. Whereas TDR boundaries may spread across geographically distinct areas, LIS boundaries are a single geographical area. To relocate development rights, both instruments separate use rights on land and their economic value from land property. Both instruments also rely on functioning land and real estate markets, where added land values are key incentives to the transfer of rights. In addition to the policy-driven components, LIS also include a property-driven dimension, which modifies plot shapes and boundaries, in coordination with the re-location of development rights. The property dimension of LIS reflects in its operating mechanism. LIS use a bottom-up approach, where landowners gather as an assembly, and decide jointly on syndicate formation and execution. The public also participates at various stages of the implementation process (see Shahab, Viallon 2019). In contrast, the design and implementation of TDR programmes rely on a top-down approach, where authorities hold responsibility for programme design and implementation. Public involvement occurs essentially through consultation (Shahab et al. 2019).

TDR and LIS differ in terms of the degree of constraint placed on landowners. In TDR programmes, authorities influence the transfer of development rights, for example, through the provision of a trading platform. The trading itself is under the responsibility of individual landowners, who decide on participation. As landowners are free to trade, there is a risk of market failure, e.g., if no (or few) credits are traded, or if authorities must replace credit buyers in order to operate the transfer of TDR. In addition, only a limited portion of landowners may decide to sell their rights. Such a situation would result in a scattered area, where some of the landowners still hold credits, or even develop, and others sell them. In LIS, the landowners' assembly holds competency to decide on re-location of property boundaries, and the commune decides on zoning changes. After landowners have negotiated on the land values and the change of property boundaries, they decide on changes through voting, and the commune adopts new zoning regulations through voting. Once property and zoning changes are approved by the canton, the transfer of development rights and new property boundaries become mandatory for all. Therefore, risks of failure in LIS are limited, as majority votes of the landowners' assembly and of the commune

condition the re-location of all development rights in two votes.

Considering the conditions of instrument implementation, the strengths of TDR programmes are the geographic size of the jurisdiction and the government level in charge of implementation. TDR programmes generally operate at a county level. As a consequence, instrument boundaries can define sending areas in remote parts of the county, and privilege central plots as receiving areas. In addition, TDR programmes may deploy across thousands of hectares and involve thousands of participating landowners, which allows for maximising the potential impact of the instrument. In contrast, LIS are under the responsibility of communes; implementation occurs mainly within areas of hundreds of hectares, owned by dozens of landowners. As a consequence, no transfer of development rights from peri-urban to urban areas is possible, and the instrument's potential impact is limited. Further, we draw attention to the fact that both instruments operate under a single jurisdiction, which limits both inter-governmental coordination and organisation issues. Lastly, the complexity of both instruments requires education and information processes targeting landowners and the public, as initial knowledge about their functioning and trust may be low (Shahab et al. 2019; Shahab, Viallon 2019).

## *6 New Instrument Suggested: Multi-Site Land Improvement Syndicates*

### *6.1 Objectives*

Based on these findings, we suggest a theoretical innovation that integrates the strengths of both TDR and LIS and merges them into a new instrument able to overcome their respective weaknesses: Multi-Site Land Improvement Syndicates (MSLIS). In accordance with recent developments in the Swiss federal spatial planning act, which prescribe the (re-)location of building zones close to existing centres and transport infrastructure, and the densification of urban areas<sup>12</sup>, MSLIS aim to relocate development rights situated in peri-urban or rural areas to more central agglomeration areas subject to densification. As such MSLIS provide a means of tackling – at cantonal scale – the three following challenges faced by numerous Swiss communes: (1) reduction of oversized building zones, (2) relocation of inadequately located building zones, and (3) fight against hoard-

ing of building land (Griffel 2006; ARE 2012; Perregaux Dupasquier 2013). The instrument contributes to the rationalisation of land-use planning, limits urban sprawl, and preserves agricultural land and natural areas, without creating inequalities between landowners susceptible to material expropriation rulings (see Box 2).

## 6.2 Mechanism

The basic instrument's mechanism is comparable to the LIS mechanism presented in section 4.2. above, with two exceptions (see also Figure 3). MSLIS distinguish between a sending (e.g. peri-urban) and a receiving (e.g. urban) area, and the authority in charge is either the canton or a joint committee of communes (see 6.4. Legal compatibility and political acceptability). Both exceptions are inspired by TDR. As in the case of LIS, landowners holding land in at least one of the two areas are part of a single landowner assembly: they approve the areas, agree on the new property shapes and boundaries in the two areas, and negotiate zoning regulations with authorities. The communes included in the instrument's boundaries simultaneously, and in a coordinated way, adopt required changes in their zoning regulations. The canton supervises both the property and zoning changes. In the peri-urban commune hosting sending area, development rights are withdrawn; in the central urban commune, defined as receiving area, development rights are maximised. Depending on the value of the land owned by the sending area landowners, landowners obtain either land or development rights in the receiving area or receive financial compensation. In both cases, all landowners share the costs and benefits of the transfer. The receiving area in the urban commune consists of a previously developed zone subject to densification or urban renewal (scenario 1) or is at the fringe of the settlement area (scenario 2).

## 6.3 Conditions of Implementation

In order to test the theoretical soundness of the instrument, we modelled expected land value changes with the following assumptions: 1) A limited number of landowners; 2) Scenarios with and without public landownership in the receiving area; 3) Variations in terms of plot surfaces and land values, both in the sending and receiving areas; 4) Previously granted development rights in the sending and receiving areas. The model's calibration was based on

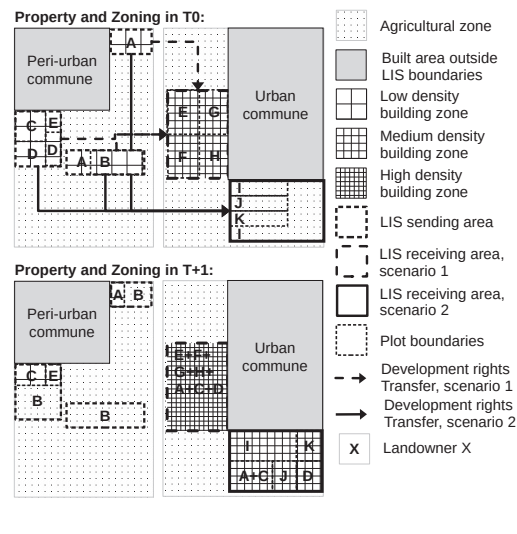
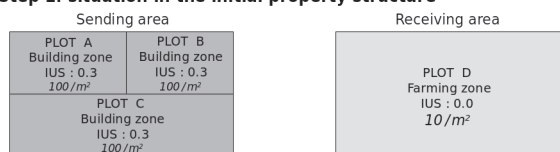


Fig. 3: Property and Zoning Changes within Multi-Site Land Improvement Syndicates. (Source: Own representation)

empirical land prices and matched realistic assumptions of size and participants, on lessons drawn by research on LIS functioning, and conditions of success (Weber et al. 2011; Baud 2016; Viallon 2017).

Figure 4 presents and illustrates the chronological steps that allow for the calculation of probable land value changes and value distribution among landowners. First, the expert committee collects information on the initial property shapes and boundaries in the sending and receiving areas, and the zoning status of each plot (step 1). Based on this information, the value of each plot in both areas is estimated, and the initial land value possessed by each landowner is determined (step 2). Then, the new property shapes and boundaries and zoning regulations are defined (step 3), and the plots are valued accordingly (step 4). The committee then calculates the profit coefficient (step 5). The value claims of each landowner are calculated by multiplying landowners' initial land value by the profit coefficient (step 6). Depending on the possessions and wishes of a landowner, the expert committee suggests a distribution of available surfaces and, if necessary, compensatory payments. As in regular LIS, landowners express their wishes regarding the nature of the gains to be distributed (step 7): a) land with increased development rights; b) a financial payment, generally used for the fine-tuning of the assignments of land plots and development rights, or, for example, if a landowner initially owns land with little value and cannot claim an entire plot; c) development rights separated from land property,

**Step 1: situation in the initial property structure****Step 2: value of the plots in the initial property structure**

Plot	Surface (m <sup>2</sup> )	Price per m <sup>2</sup>	Value (CHF)
A	6000	100	600 000
B	5000	100	500 000
C	9000	100	900 000
D	20000	10	200 000
<b>Global</b>	<b>40 000</b>		<b>2 200 000</b>

**Step 3: situation in the new property structure****Step 4: value of the plots in the new property structure**

Plot	Surface (m <sup>2</sup> )	Price per m <sup>2</sup>	Value (CHF)
A	6000	10	60 000
B	5000	10	50 000
C	9000	10	90 000
D	20000	250	5 000 000
<b>Global</b>	<b>40 000</b>		<b>5 200 000</b>

**Step 5: calculation of the profit coefficient**

PC = global value of the new property structure divided by the global value of the initial property structure =  $5\,200\,000 / 2\,200\,000 = 2.36$

**Step 6: claims of the landowners**

Owner	Value of the FPS	PC	Claims (CHF)
A	600 000	2.36	1 418 182
B	500 000	2.36	1 181 818
C	900 000	2.36	2 127 273
D	200 000	2.36	472 727
<b>Global</b>	<b>2 200 000</b>	<b>2.36</b>	<b>5 200 000</b>

**Step 7: wishes of the landowners**

Owner	Wishes	Claims and new plot values	Corresponding surface	Commentary
A	Plot to built	1 418 182 250/m <sup>2</sup>	5 673 m <sup>2</sup>	The owner A chooses to have a building plot bigger than their claim
B	Plot to built	1 181 818 250/m <sup>2</sup>	4 727 m <sup>2</sup>	The owner B chooses to balance the size of the parcel and their claim
C	Plot to built	2 127 273 250/m <sup>2</sup>	8 509 m <sup>2</sup>	The owner C chooses to balance the size of the parcel and their claim
D	Farming land	472 727 10/250/m <sup>2</sup>	47 273 m <sup>2</sup>	Only 20 000 m <sup>2</sup> of agricultural land available. D receives a financial compensation paid by A, B and C

**Step 8: assignments and calculation of payments**

Owner	Claims	Assigned value	Payments (CHF)
A	1 418 182	$7\,000 * 250/m^2 = 1\,750\,000$	331 818
B	1 181 818	$4\,500 * 250/m^2 = 1\,125\,000$	- 56 818
C	2 127 273	$8\,500 * 250/m^2 = 2\,125\,000$	- 2 273
D	472 727	$20\,000 m^2 * 10/m^2 = 200\,000$	- 272 727
<b>Global</b>	<b>5 200 000</b>	<b>5 200 000</b>	

Fig. 4: Chronological Steps for the Implementation of Multi-Site Land Improvement Syndicates. (Source: Own representation)

e.g., in a condominium ownership, if the landowner cannot claim an entire plot; d) additional land surfaces with no development rights, e.g., a farming landowner who wants to maintain wide surfaces without development rights. Such assignment (with little economic value) is likely to be combined with a financial payment. Finally (step 8), financial payments among landowners compensate for the value difference between landowners' claims (step 6), and the value of assigned development rights and land plots (step 7).

In theory, MSLIS is compatible with and could function under similar conditions to those of the existing single-area LIS. In practice, two conditions need to be considered. The first of these is the reorientation of existing practices. Communes in the cantons of Fribourg and Vaud have attempted to use an MSLIS approach through an informal market of development rights (Bourgeois 2015; Francey 2017), and authorities and private landowners have been speculating on the transfer of these rights. Indeed, the lengthy implementation process of the new federal law generates a noticeable lag between a significant number of new areas to

be re-zoned and compensated, and a relatively low number of new areas to be zoned and used for compensation. The use of MSLIS would require a majority of landowners in a designated area to agree to the use of the instrument. The second condition to consider is the creation of incentives for landowners in the receiving area to adopt the new property structure and accept the transfer of development rights. In fact, implementation of MSLIS generates compensation issues for receiving areas. As densification is already a legal objective, incentives are necessary for landowners in the receiving urban areas to 'host' additional development rights on their land.

#### 6.4 Legal Compatibility and Political Acceptability

In the case of Canton Vaud, the legal changes required to use MSLIS affect the Land Re-adjustment Act<sup>13</sup>, which prescribes the geographic unity of LIS. The introduction of MSLIS would *a priori* solely require the removal of this disposition, or modification by substituting the geographic unity of the area with a

functional one, i.e., an area based on the geographic boundaries of socio-economic interaction (Varone et al. 2013). Analogically with LIS, MSLIS would overcome the expropriation question by excluding instrument boundaries from expropriation law, on the condition that all landowners are treated equally. Legal changes necessary in other cantons, or those necessary for inter-cantonal rights transfer, would require further investigation. Instrument implementation would also require vertical coordination between cantonal authorities and communes. If the canton defines instrument boundaries, communes may have to implement them into local zoning regulations. To do so, each commune involved would elaborate a local development plan and define new zoning regulations for MSLIS areas located in their respective jurisdiction. The revision of communal zoning changes and, in particular, their approval by cantonal authorities, would have to occur concomitantly in all communes involved, so as to ensure the effective transfer of rights. If communes define instrument boundaries on their own, additional coordination issues may appear between communes. For example, the commune where the receiving area is located might lack incentives to welcome new landowners, or additional infrastructure and public service costs might be perceived as a burden on the communal budget.

On the landowners' side, if the financial gains generated by the increase in density in the receiving area are high, landowners might have an interest in receiving additional development rights, for example, if agricultural land was zoned on the edge of a relatively dense urban area (scenario 2 in Figure 3). In this scenario, the profit coefficient is highest. Referring to empirical observations of regular LIS, and to the financial model we conceptualised (Figure 4), a profit coefficient superior to 1.5 might generate sufficient support from a majority of landowners. This might not be the case if the receiving area is already located in a building zone (scenario 1 in Figure 3). In this case, two more factors should be taken into account in order to obtain landowner agreement for the relocation of development rights. First, landowners in the receiving area might consider the profit coefficient of 1.5 as arbitrary and assume that they are being negatively affected despite an increase in development rights. In fact, additional development rights belonging to other landowners would be 'hosted' on their plot. Why would the receiving landowners agree to share the gains when they could keep the en-

tire added value to themselves? A facilitating factor for acceptance of new landowners into the receiving area would be public property, which is a rarely fulfilled condition. As in LIS, instrument areas and MSLIS changes to plot shapes and boundaries, as well as land values, are subject to majority approval by landowners. In this way, it is possible to force a minority of landowners to participate in the procedure, even if the minority owns strategic plot(s) within the receiving area of MSLIS. Moreover, is it relevant to calculate the same profit coefficient for landowners in the sending area, as without MSLIS, they would, in the best case, be entitled to compensation for the loss of their rights? Plainly, one could consider that MSLIS overcompensates sending landowners. The transfer and compensation of their development rights through MSLIS is already a favourable situation: the value of their new plot (or of their development rights) in the receiving area is likely to rise further, due to the increased scarcity of building zones, and to the more central location of their relocated development rights.

### 6.5 *Advantages and Disadvantages*

Potential land-use changes stemming from MSLIS would occur within functional spaces. In the rural or peri-urban sending area, the removal of unused development rights is expected, as well as a limitation of new construction on open land. In the central receiving area, the development of new neighbourhoods on open land, or on already developed areas subject to urban renewal, is anticipated. If the relocation of development rights takes place between two or more communes, the question of inter-communal compensation arises (for example, to provide additional public services in the receiving area). Redistributive questions between communes will become prominent if the mechanism of MSLIS is generalised. Communes that renounce urban development will also request compensation, e.g., for fiscal losses. Two options can be envisioned: a) the implementation of a taxation mechanism on development rights, which would tax added land values in the receiving area and reduce landowners' revenues. This revenue could benefit both receiving and sending communes. b) The implementation of an inter-communal tax redistribution system, which brings us back to the issue of fiscal competition mentioned in section 3.4. Overall, communes face contradictory orders due to the juxtaposition of poorly coordinated (layers of) sectoral policies, such as

planning, fiscal policy, economic development, and agriculture. While the current tax system encourages communes to maximise their urban development, the federal law and cantonal master plan lead to unfair competition by restricting the spatial allocation of development rights. The necessary re-location of development rights requires a change of scale in the conduct of territorial development. Only the development of cantonal or inter-communal coordination in land-use planning under the cantonal leadership is likely to rectify these issues.

## 7 Discussion and Conclusion

This article sought to discuss available and potential instruments for limiting urban sprawl and greenfield development in Switzerland. The 2014 revision of the Federal Spatial Planning Act lacked proposals to solve the issue. We suggested an innovative way to overcome the current building zone problems by analysing three policy instruments that may prove adequate for re-locating development rights. Referring to existing academic discussions and land-use practices in Switzerland, we identified two existing instruments that may contribute to solving the issue, TDR and LIS. The analysis of both instruments' respective strengths and weaknesses showed their "chiasmic" nature. As opposed to LIS, the boundaries of which include hundreds of hectares within a contiguous area, the boundaries of TDR programmes may transfer rights between geographically distinct areas covering thousands of hectares. TDR programmes may also target thousands of landowners, whereas LIS may be limited to dozens. Considering the instruments' delivery system, TDR programmes create a market for landowners to voluntarily exchange rights, whereas LIS secure the transfer of development rights through a binding vote of landowners. Further, LIS coordinate property changes with zoning regulations, and thus ensure the optimal re-location of land uses. In contrast, TDR programmes may lack coordination with land-use regulations or growth-management provisions, and thus produce sub-optimal outcomes (see Linkous, Chapin 2014).

Based on the identified strengths and weaknesses, we suggested MSLIS as a new instrument combining the advantages of both TDR programmes and LIS. MSLIS may, in our view, contribute to the achievement of the 2014 FSPA goals, such as the (re-)location of development rights. Among the characteristics of MSLIS, in-

strument boundaries in geographically distinct areas are used as a vehicle to define areas with low demand for development, and central areas with high demand for development. A second vehicle is the mechanism of value distribution among MSLIS members. Depending on their individual preferences, participating landowners chose between additional land value (e.g., more development rights), compensation in kind (more land surface of lesser value), financial compensation, or a mix of the above. Also, the re-allocation of land uses follows specific delivery systems and rules. First of all, the canton defines instrument boundaries. Then, landowners assemble and decide, through a majority vote, on land values and changes to property boundaries. Simultaneously, communes define and adopt a development plan specific to MSLIS areas located in their respective jurisdiction. In its role as the supervisory authority, the canton ensures the coordination of zoning and landowner decisions through their concomitant approval. As a result, changes to property boundaries and zoning regulations may secure the optimal distribution of new land uses and values, both from the perspective of landowners and planners. The former benefit from increased use and/or economic value; the latter re-locate development rights to more central areas and preserve agricultural and natural areas.

The results of the analysis of the three instruments and of their respective legal-institutional contexts lead to five remarks. First, the definition of geographic boundaries for the successful transfer of rights operates smoother with a mix of urban and rural landowners aiming to use the land differently. Without differences in land uses and values, re-location of development rights may prove difficult. Second, different decision mechanisms between TDR and LIS/MSLIS produce different quantitative and qualitative changes within defined geographical boundaries. Whereas TDR programmes 'cast the net' far and wide, LIS/MSLIS have surgical precision. In terms of effects, TDR programmes may result in a scattered re-location of development rights, and only partially achieve containment of sprawl. In contrast, LIS/MSLIS do not miss anything, and their effectiveness is outstanding. Third, issues of coordination across jurisdictions may exist both for TDR and MSLIS, as the boundaries of the jurisdiction where they operate do not necessarily match functional boundaries of the political problem to be solved, i.e., urban sprawl. The discussion on the legal compati-



bility of TDR with Swiss institutions pointed towards significant issues of horizontal and vertical policy coordination, which would require substantial legislative changes (see section 3.4). Instead, MSLIS would require few changes in Swiss cantonal legislation. Fourth, in terms of political acceptability, both instruments induce positive and negative spillovers for planning authorities. As the institutional setting is based on fiscal competition, the question of financial compensation between communes constitutes a challenge for the re-location of development rights. In line with the Tinbergen Rule, we suggest overcoming such flawed coordination among sectoral policies through separate, additional, and specific policy instruments. Fifth, TDR programmes raise questions about compensation claims of landowners selling their credits for a lesser value than what their development right is actually worth. In this case, TDR may not substitute for full compensation, and authorities may have to provide additional compensation. On the other hand, MSLIS may prove compatible with the guarantee of property. Lastly, the authors are aware that the context and conditions of instrument implementation discussed in the paper primarily apply to Switzerland. Nevertheless, we also believe our suggestions may prove effective in other countries facing similar problems of building zone re-location, particularly in those countries with strong protection of land property and derived uses.

### Acknowledgements

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### Notes

- 1 The main changes introduced by the revised Spatial Planning Act were additional quantitative restrictions on the definition of new building zones, the restriction of over-sized building zones, the introduction of a mandatory tax on added land value of at least 20% of the land value, densification measures, and reduced requirements to set up solar power systems (Hengstermann 2019: 230f.).
- 2 As of April 2020, six cantons were still subject to a federal moratorium on zoning decisions: Geneva, Zurich, Ticino, Obwald, Nidwald, and Glarus. [https://www.are.admin.ch/are/fr/home/developpement-et-amenagement-du-territoire/droit-de-l\\_amenagement-du-territoire/](https://www.are.admin.ch/are/fr/home/developpement-et-amenagement-du-territoire/droit-de-l_amenagement-du-territoire/)

revision-de-la-loi-sur-lamenagement-du-territoire--lat-/lat-1--une-mise-en-oeuvre-consequente-du-developpement-de-lurban-gel-des-classements.html.

- 3 See Federal Court decision 105 Ia 134 of the 2 March 1979.
- 4 In the agglomeration of Lausanne, for example, cantonal and communal authorities have defined minimal densities in central locations of the agglomeration that benefit from excellent connections to public transport (Canton Vaud, ALM 2012).
- 5 In 2012, Canton Thurgau set up a compensation mechanism for non-zoning, i.e., communes could apply for financial compensation in cases where they renounce a building zone extension. In the last revision of the cantonal structure plan in 2018, the system was abandoned (Canton Thurgau 2018).
- 6 The authors chose the number of acres preserved as a criterion of success of TDR programmes, relevant in regard to the issue of urban sprawl, a main concern of the article.
- 7 Art. 20 FSPA, SR 700.
- 8 SR-VD 700.11 and SR-VD 913.11.
- 9 E.g., decisions of the Federal Supreme Court 1C\_549/2016, 1C\_550/2016, 1C\_554/2016, 1C\_555/2016, and 1C\_552/2016.
- 10 Art. 113 LE, SR-VD 710.01.
- 11 A price above the land's value prior to the setup of the syndicate, but below the land's value once the syndicate is dissolved.
- 12 Art. 1 par. 2 let. a<sup>bis</sup> and let. b, and art. 3 par. 3 let. a and a<sup>bis</sup> FSPA, SR 700.
- 13 Art. 52 al. 1 LAF, RS-VD 913.11.

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Dr. François-Xavier Viallon  
Swiss Federal University  
for Vocational Education and  
Training  
Kirchlindachstr. 79  
3052 Zollikofen, Switzerland  
francois-xavier.viallon@ehb.swiss

Associate Professor  
Pierre-Henri Bombenger  
University of Applied Sciences  
Western Switzerland  
Territorial Engineering Institute  
Route de Cheseaux 1  
CP521  
1401 Yverdon-les-Bains  
Switzerland  
pierre-henri.bombenger@  
heig-vd.ch

Denis Leroy  
University of Applied Sciences  
Western Switzerland  
Territorial Engineering Institute  
Route de Cheseaux 1  
CP521  
1401 Yverdon-les-Bains  
Switzerland  
denis.leroy@vd.ch

Professor  
Stéphane Nahrath  
University of Lausanne  
Swiss Graduate School of Public  
Administration  
1015 Lausanne, Switzerland  
stephane.nahrath@unil.ch