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Implementation of redistributive land policy instruments in peri-urban spaces: the case of Oberaargau (1990-2014)

Working paper de l'IDHEAP 6/2016
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Soil as a Resource
National Research Programme NRP 68

Project SUMSOR
Sustainable management of soil as a resource

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Published: June 2016

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Executive summary

This working paper deals with land use policy and spatial development dynamics in the Swiss region of Oberaargau from 1990 to 2014. It aims to evaluate the redistribution of economic and ecological added and reduced value in land policy at two different scales.

The regional analysis showed that contextual factors such as demographic evolution, location, economic condition, polity setting and political context strongly influence land use. Important subregional disparities exist and current land use policy does not always take them into account: while some easy accessible communes experienced an important increase in terms of population and constructions and would have benefited from additional development rights, others fostered outsize growth and promoted the extension of building zones despite a shrinking population level.

The local analysis dealt with the politics of policy instruments implementation in the communes of Wiedlisbach, Huttwil and Niederbipp. It showed that existing redistributive instruments were marginally implemented, sometimes even applied to unforeseen purposes: zoning was used in order to circumvent legal restrictions on the extension of the building zone, the tax on added land value created by zoning and the land service tax are were levied through lump sum taxation, or, in another case, the amount taxed was subject to important variations. In all cases, the existing instruments did not allow the redistribution of value beyond communal borders.

However, redistributive instruments may help to reduce subregional disparities in the future. Therefore, the following issues should be addressed by policy makers:

1. A building obligation, particularly for already zoned-in plots is essential, as the gap between zoning and effective land use remains important;

2. The calculation method for building zone dimensioning, as it grants until today each commune the right to zone regardless of their demographic evolution;

3. Instruments allowing the redistribution of value at supra-communal or regional levels in order to compensate advantages and disadvantages resulting from institutional changes, such as zoning restrictions for communes, development rights transfer for landowners, or the remediation of contaminated sites.

Contents

List of Figures

List of Tables

List of key abbreviations

Federal legal acts

BV:	Federal Constitution, SR 101.
CC:	Civil code, SR 210.
CO:	Code of obligations, SR 220.
RPG/LAT:	Spatial planning act, SR 700.
RPV/OLAT:	Spatial planning ordinance, SR 700.1.
USG/LPE:	Environmental protection act, SR 814.01.
VBBo/OSol:	Soil pollution ordinance, SR 814.12.
AltV/OSites:	Ordinance on the remediation of contaminated sites, SR 814.680.
StHG/LHID:	Act on the harmonisation of cantonal and communal direct taxes, SR 642.14.

Cantonal legal acts

KV:	Bernese cantonal Constitution, SR-BE 101.1.
BauG:	Bernese constructions act, SR-BE 721.
nBauG:	new Bernese constructions act, currently in consultation process.
GG:	Bernese act on the communes, SR-BE 170.11.
StG:	Bernese tax law, SR-BE 661.11.

Technical terms

RGSK:	Regional global transport and settlement plan / Regionales Gesamtverkehr- und Siedlungskonzept. / Conception régionale des transports et de l'urbanisation. Mandatory regional structure plan that includes the agglomeration programs financed by the Confederation (Region Oberaargau and Canton of Berne 2012).
SR/RS:	Classified compilation of federal legislation / Systematische Sammlung des Bundesrechts / Recueil systématique des lois fédérales. For cantonal acts, it is complemented with the canton's acronym (*e.g.* SR-BE).
UVP/EIE:	Environmental impact assessment / Umweltverträglichkeitsprüfung / Etude d'impact sur l'environnement.

Departments and offices of the federal administration

DETEC:	Federal Department of the environment, transport, energy and communications / Eidgenössisches Departement für Umwelt, Verkehr, Energie und Kommunikation / Département fédéral de l'environnement, des transports, de l'énergie et de la communication.
FDHA:	Federal Department of Home Affairs / Eidgenössisches Departement des Innern / Département fédéral de l'intérieur.
ARE:	Federal spatial planning office / Bundesamt für Raumentwicklung / Office fédéral du développement territorial, part of the DETEC.
FOEN:	Federal Office for the environment / Bundesamt für Umwelt / Office fédéral de l'environnement, part of the DETEC.
BFS/OFS:	Federal statistical Office / Bundesamt für Statistik / Office fédéral de la statistique, part of the FDHA
swisstopo:	Federal Office of topography / Bundesamt für Topographie / Office fédéral de la topographie.

Bernese directorates and offices

BVE:	Constructions, transport and energy Directorate* / Bau-, Verkehrs- und Energiedirektion / Direction des travaux publics, des transports et de l'énergie. Directorate of AGR until 1995.
JGK:	Directorate of justice, of the communes and churches* / Justiz-, Gemeinde- und Kirchendirektion / Direction de la justice, des affaires communales et des affaires ecclésiastiques. Current directorate of the AGR.
VOL:	Directorate of public economy* / Volkswirtschaftdirektion / Direction de l'économie publique.
FIN:	Finance Directorate* / Finanzdirektion / Direction des finances.
AGR:	Office of the communes and spatial planning* / Amt für Gemeinden und Raumordnung / Office des affaires communales et de l'organisation du territoire. Part of the JGK.
AWA:	Waste and water Office* / Amt für Wasser und Abfall / Office des eaux et des déchets. Part of the BVE.
LANAT:	Office of agriculture and nature* / Amt für Landwirtschaft und Natur / Office de l'agriculture et de la nature. Part of the VOL.

∗: Own translation.

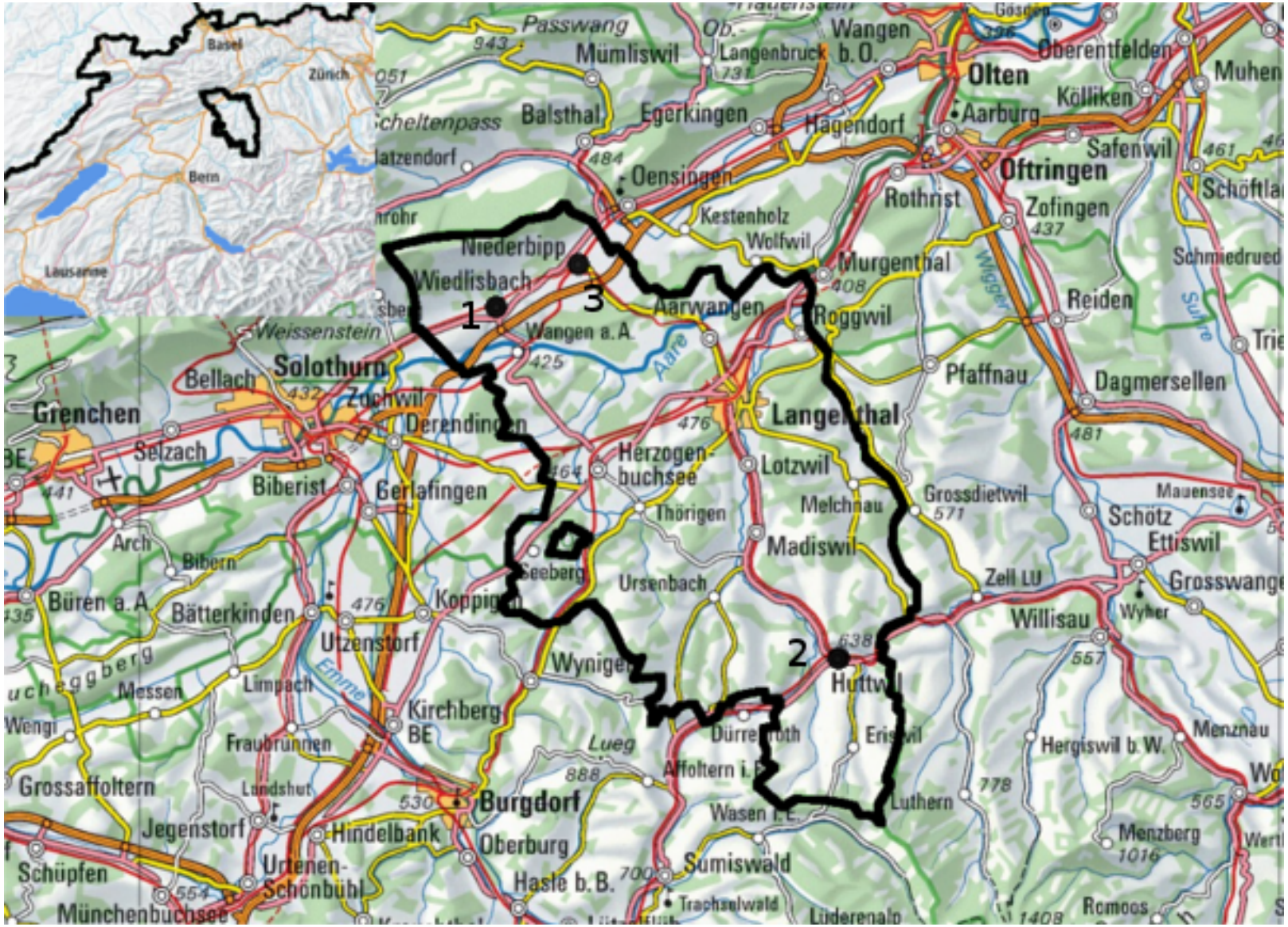


Figure 1: Overview map of Oberaargau and its region (Swisstopo, 2014a). Scale: 1:500,000. The black marked perimeter corresponds to the administrative district Oberaargau.

Foreword

Part of the National Research Program 68 financed by the Swiss national science foundation through the grant number `406840_143057`, the SUstainable Management of SOil as a Resource (SUMSOR) project asked five main research questions (Nahrath et al., 2012):

1. What are the main economic, demographic, as well as institutional, political and fiscal drivers of spatial development in different types of spaces in Switzerland (urban, peri-urban, mountainous)?
2. What are the impacts of spatial development on economic and ecological soil added and reduced values in the different types of spaces?
3. What are the existing policy instruments currently dealing, in Switzerland and abroad, with the question of added(reduced value redistribution?
4. What are the most relevant (sets of) policy instruments that allow to integrate objectives in terms of soil quality into densification strategies? To what extent are the (sets of) policy instruments able to create "win-win" situations?
5. What are the main institutional conditions (or changes required) for the implementation of these policy instruments in the Swiss institutional regime of soil?

In order to answer these questions, one of the means chosen by the research team was to elaborate working papers that analyse the different types of spaces in Switzerland: the present working paper focusses on the peri-urban region of Oberaargau (Viallon, 2016a); two other working papers analyse urban dynamics in the region of Lausanne (Viallon, 2016c,b). The present document structures the results obtained for Oberaargau in four chapters:

Chapter 1 describes spatial development dynamics from 1990 to 2014 in Oberaargau and compares them with national and cantonal development in order to:

- Describe the evolution of land use and zoning;
- Identify the main factors influencing land use and zoning;
- Characterize the peri-urban specificities of the region Oberaargau.

Chapter 2 provides analytical concepts from political and administrative sciences as well as the main elements of the analytical framework used in the analysis, *i. e.* the institutional resource regime framework. The chapter also provides a provisional classification of available land policy instruments.

Chapter 3 analyses the politics of land policy instruments implementation. Three case studies in the communes of Wiedlisbach, Huttwil and Niederbipp show past and present spatial development dynamics and analyse how local authorities have used policy instruments in order to implement land policy objectives and overcome land policy challenges they faced.

Chapter 4 analyses and evaluates the regulatory and redistributive capacities of the current and potential future[1] institutional regime of soil.

This document summarizes the results gathered by the SUMSOR research team on the region of Oberaargau, in particular the results of the qualitative case studies conducted by the author. The other team members have provided data and maps used in the first chapter dealing with the regional analysis. The document's content has been discussed with the Ph.D. supervisors of the author, Prof. Stéphane Nahrath (University of Lausanne) and Prof. Géraldine Pflieger (University of Geneva). The proof reading has been done by Daniel Baumgartel, teaching assistant at the English Department of the University of Lausanne. I would like to thank my supervisors and proof reader for their comments on previous versions of this document. I would also like to thank the persons who granted me time for an interview.

[1] The Bernese land use planning act is currently in the consultation procedure and thus might incur changes. Therefore, no final statement can be made on the effective future law.

Chapter 1

Spatial development dynamics at regional level from 1990 to 2014

This chapter provides an overview of main land use and zoning changes in the region of Oberaargau and identifies the main factors influencing them. Regional specificities, as well as its representativeness of peri-urban regions are presented in order to explain zoning and land use changes. Based on the project design (section), the following sections and chapters present the evolution of land use and zoning as dependent variables (section 1.1) and the contextual factors influencing them (section 1.2).

1.1 Evolution of land use and land value in Oberaargau from 1990 to 2014

This section presents zoning and effective land use at the regional level from 1990 until today. The first subsection (1.1.1) shows the evolution of the ecological value of the region, primarily through an analysis of land use changes. The second subsection (1.1.2) deals with economic value creation within the same time period, paying special attention to past and present building zone capacity. The third subsection (1.1.3) summarizes the main rivalries resulting from land use, and evaluates the type and location of conflicts that are likely to be observed on a local scale.

A region in the middle of the Swiss plateau

Part of the Swiss plateau, the region of Oberaargau is the north eastern district in the Canton of Berne. It is located between the cantons of Solothurn, Aargau and Lucerne. Its northern limit is the Jura mountains, and its southern limit the Emmental. The motorway and the national train lines cross the northern central part of the region, where the major of economic activity and population are located. Over the last decades, these areas of the region experienced higher growth and urbanization than the southern part, which declined slightly.

1.1.1 Evolution of the ecological value of land

Which ecological indicator is relevant?

The assessment of the ecological value of land is a complicated task, as one can rely on various indicators, and hardly evaluate the quality of different natural elements or assess the services they provide for humans. The Millennium ecosystem assessment (VV. AA., 2005a, 51) mentions the following examples of indicators describing ecosystem condition:

Land cover change as central indicator

In terms of soil, one central factor driving ecosystem condition or ecological value is land cover change (VV. AA., 2005b, 86). As one can read from the data provided by the *Arealstatistik* (tables 1.2 and 1.3), land cover change is happening and it increased from around 324 to 336 ha between the 1980s and 1990s in Oberaargau. Land surface used by buildings account for 73% of overall urban sprawl while new transport infrastructure (such as the new high speed train track between Mattstetten and Rothrist) accounts for 23% of the artificial surfaces. Compared to the national

Ecosystem condition	Examples of indicators
Condition of vegetation	Landscape fragmentation
Condition of soil	Soil nutrients
	Soil salinization
Condition of biodiversity	Species richness
	Threatened species
	Visibility of indicator species
Condition of fresh water	Presence of contaminants

Table 1.1: Examples of indicators to assess ecosystem condition according to the Millennium ecosystem assessment (VV. AA., 2005a).

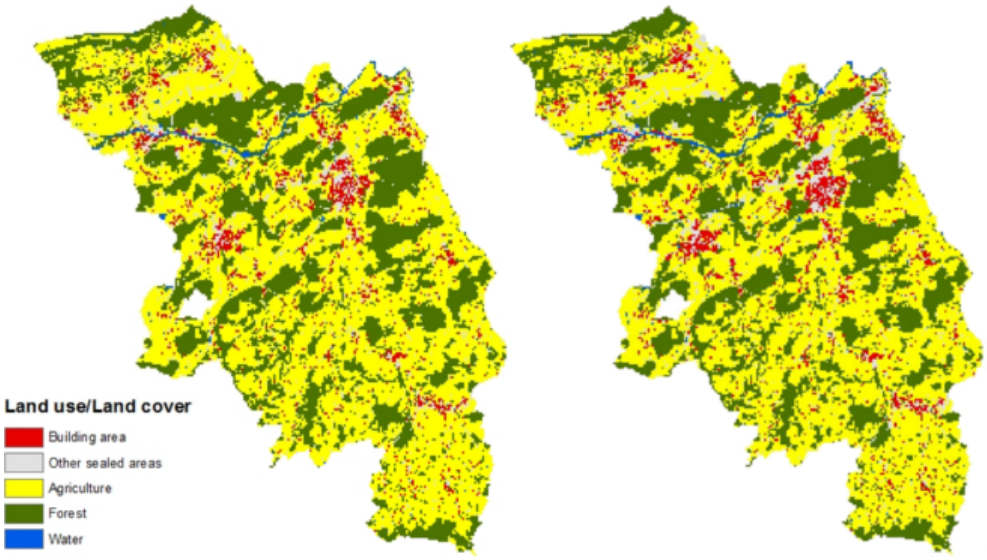


Figure 1.1: Land uses and land cover in Oberaargau based on data from the *Arealstatistik* 1981 and 2006. Data: BFS (VVYY).

level, land cover change slowed down from 32,471 ha in the 1980s to 25,951 ha in the 1990s.

Increase of settlement under national average

Figure 1.1 shows a regional dominance of agriculturally used open land, followed by forest and settlement. Comparing the two maps, one can see that the increase of settlement area occurs essentially where built areas already exist. Numerical data (table 1.2) gives a more detailed overview of these land use changes: between the first and the last inventory period of the *Arealstatistik* (BFS, VVYY), there is an increase of the settlement area of approximately 23% in Oberaargau . A more important increase of 32% can be observed over the entirety of Switzerland (table 1.3). Further, one can notice that between the three inventory periods, the absolute and relative growth of the settlement area remains constant in Oberaargau at approximately 15 ha per year, whereas it has slowed down in Switzerland as a whole.

No increase in forest surface

The forest area is less dominant in Oberaargau than in the rest of Switzerland. In Oberaargau, it even declined between 1979/85 and 2004/09, while increasing by more than 3

(ha)	**1981**	Δ	**1994**	Δ	**2006**	Σ Δ in %
Building area:	1,641	+207	1,848	+165	2,013	+23%
Other sealed areas:	1,647	+117	1,764	+171	1,935	+17%
Agriculture:	19,084	–339	18,745	–271	18,474	–3%
Forest:	10,431	—	10,413	—	10,352	—
Other:	299	—	332	—	328	—

Table 1.2: Land use/land cover surfaces in Oberaargau based on data from the *Arealstatistik* 1979/85, 1992/97 and 2004/09. Data: BFS (VVYY).

3% loss of farmland over 25 years

Figure 1.2 shows the intensity of surface change from “agriculture” to “building area”. Between 1981 and 2006, almost 3% of farmland lost its productive use in Oberaargau; this quantity is below the national average of 5.4%. These changes

(ha)	**1979/85**	Δ	**1992/97**	Δ	**2004/09**	Σ Δ in %
Building area:	114,993	+20,483	135,476	+16,533	152,009	+32%
Other sealed areas:	134,482	+11,988	146,470	+9,418	155,888	+16%
Agriculture:	156,674	–5,208	151,466	–3,300	148,166	–5%
Forest:	125,452	—	128,192	—	129,306	+3%
Other:	105,775	—	104,996	—	104,587	—

Table 1.3: Surface of land use/land cover surfaces in Switzerland based on data from the *Arealstatistik* 1979/85, 1992/97 and 2004/09. Data: BFS (VVYY).

occur, notably, in the form of an increase of impermeable surfaces and extension, as well as densification of built surfaces (Lambelet-Haueter et al., 2011, 222ff): they induce a reduction of the soil's ecological value through the destruction of biodiversity and fertility, and soil compaction and pollution.

Figure 1.2: Evolution of farmland compared to the size of the commune between 1981 to 2006 in Oberaargau. Farmland includes orchards, vineyards, pastures and fields outside the forest area. Standard deviation. Data: BFS (VVYY, 2014b).

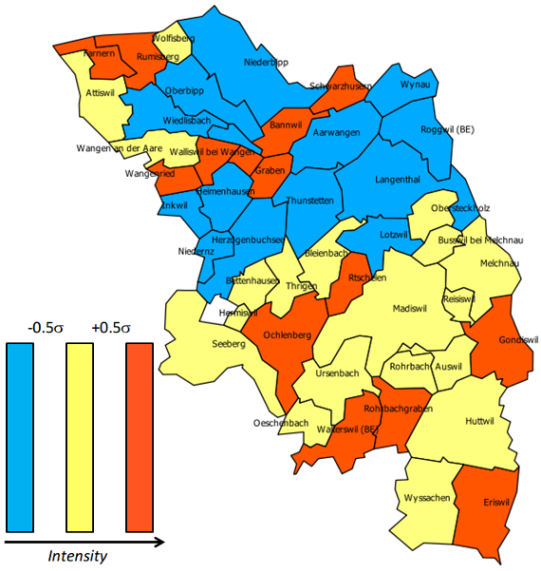


Figure 1.3 shows where the effective land use changes have been most frequent during the last 30 years. I observe that there is high pressure in the centre west of Oberaargau, particularly in the commune of Niederönz (west of Herzogenbuchsee) and the surrounding area. This same tendency exists in the communes around Langenthal: in the timespan between 1985 and 1997, construction is especially frequent in Aarwangen (north), Thunstetten (west), Roggwil (east) and Madiswil (south). However, during the second period of observation, activity is more scattered and strongly decreases in Madiswil. In Bipperamt, Niederbipp and Oberbipp new construction has been frequent, and is ongoing. Between 1997 and 2009, construction was more concentrated around Niederbipp. On the contrary, construction frequency has (in comparison with the past) lowered in the southern, center and northern parts of the region.

Frequent land use changes in the centre and north

The categorization of communes made by the Federal Statistical Office (figure 1.4) confirms the pressure of construction on land use in the center and north: relying on the statistical definition of the typology (Schuler and Joye, 2000), the switch of two communes from "industrial/tertiary" (purple) to "suburban" (red) and five formerly "rural commuter communes" (green) become "peri-urban" (yellow). This can be explained by the development of industry in the north and the increase of residents[1] (with commuters to regional, cantonal or national centres for work). The southern part of the region remains predominantly agricultural.

Rural north becomes residential and industrial

Another relevant the presence or absence of contaminants is another indicator to assess the ecological value of soil. (VV. AA., 2005a, 51). Brownfields and landfills are soils whose ecological value has been at least partly destroyed. These sites hold the potential to spread the pollution, causing further damage to the ecosystem. In

Contamination of soil as additional relevant indicator

[1]The building statistics show that in the five peri-urban communes, 50% of the constructions between 1995 and 2012 were single family homes, 20 to 30% were semi-detached houses and at most, 12% apartment buildings (BFS, 2012).

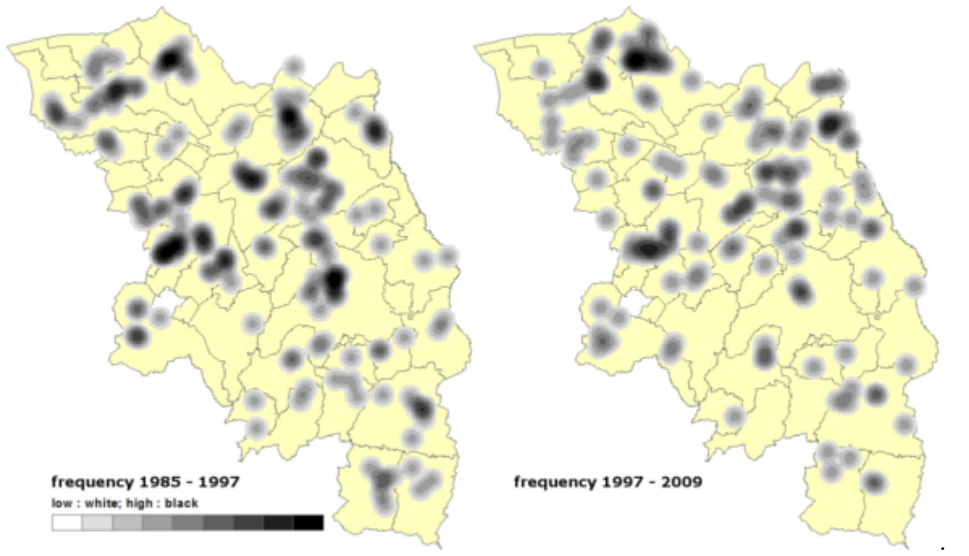


Figure 1.3: Frequency of changes from agricultural land (*Landwirtschaftsfläche*) to settlement (*Gebäudeareal*) between 1985 and 1997 respectively 1997 and 2009. Data: BFS (2014b, VVYY).

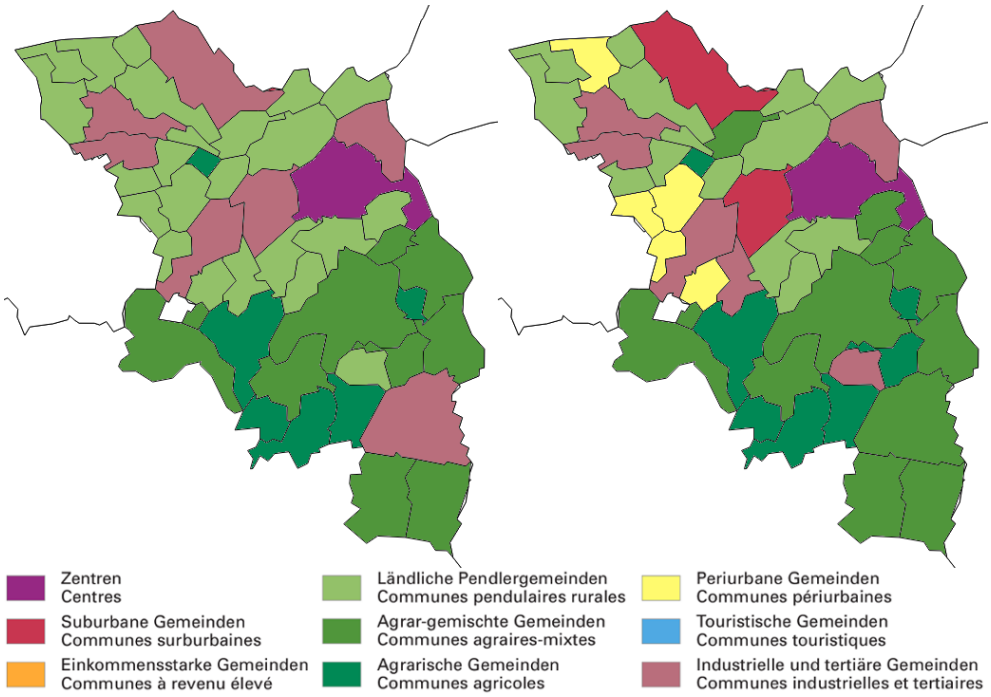


Figure 1.4: Communes of Oberaargau in 1990 and 2000 according to BFS typology. Data: BFS (2014b); Schuler and Joye (2000).

the canton of Bern, the Bernese cadastre of polluted soils registers 4,862 sites as polluted. The majority of the contamination (2,256) is found on operating sites. The remainder is divided among disposal sites (1,859), shooting ranges (692) and the locations of former accidents (55). Among these polluted sites, the law[2] distinguishes two broad categories:

- In the first category, the pollution has no further impact on the environment because its contents are inert, (i.e.*e.g.* certain construction materials) or its toxicity does not reach the values fixed by law. In these cases, the site does not require monitoring, whereas in the others, specific treatment and/or surveillance is required;

[2] *Federal act of the 7 October 1983 on environmental protection*, SR 814.01.

- Within the second category, there are three types of soils:
  - Those that need to be analysed to determine the type and amount of pollution present;
  - Those that require surveillance, because the contamination exceeds legal values and could spread (*e.g.* into groundwater);
  - Those that require intervention in the form of decontamination or other physical intervention measures.

As figure 1.5 shows, many various sites in Oberaargau are registered in the cadastre. The major ones (in red), are primarily landfills filled with construction material and other inert waste and are therefore part of the first category of sites mentioned above.

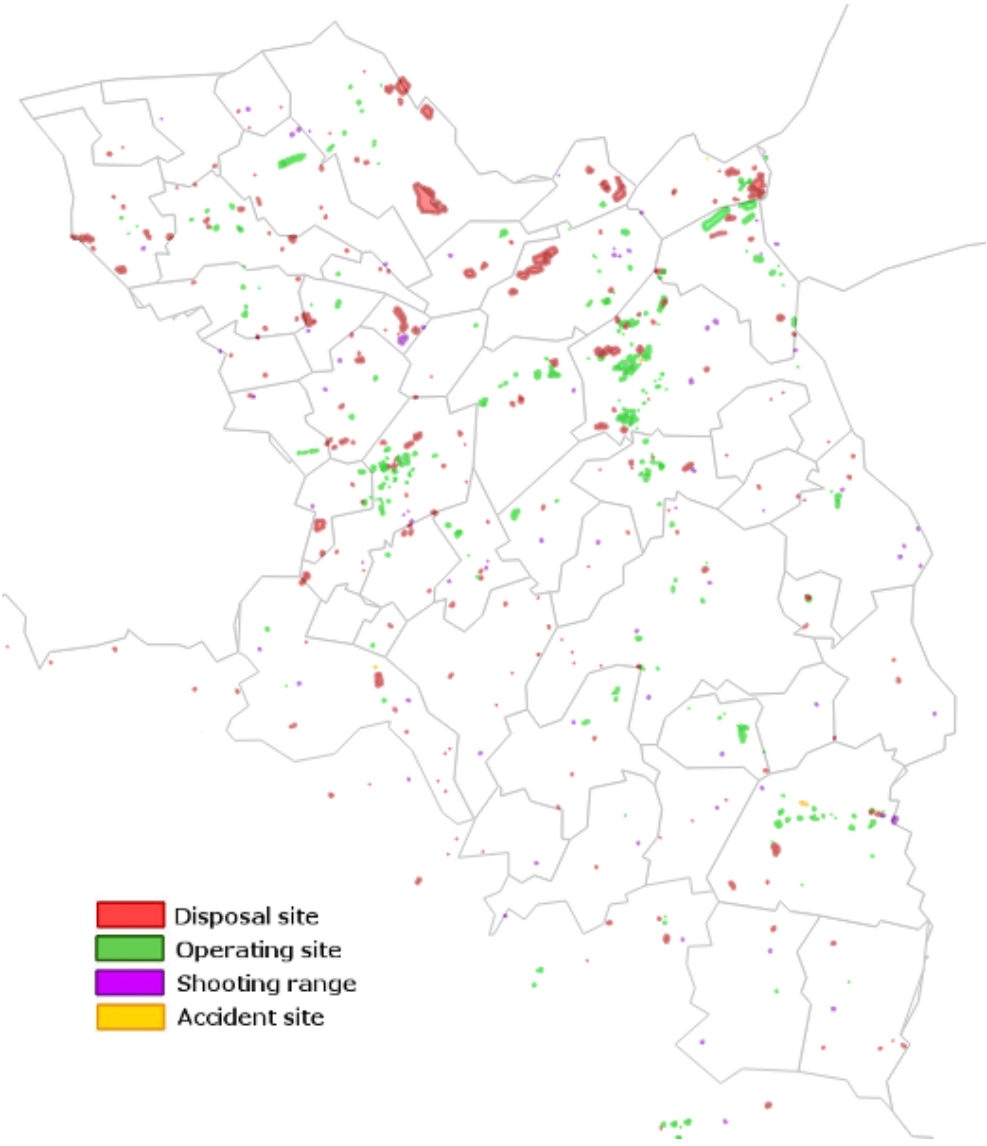


Figure 1.5: Cadastre of polluted soils in Oberaargau. Data: AWA (2014). Map: BFS (2014b).

1.1.2 Evolution of the economic value of land

Constant land prices over the last ten years

In regard to land prices, the scarce data available allow us only to assert that there is price reduction between 2003 and 2014 on serviced land for single family homes (Wüest and Partner, VVYY): these prices lowered from 260 francs/m^2 to approximately 190 francs/m^2 for the median plot.

House price increase covered by construction costs increase

As land prices are derivatives of real estate transaction prices[3], real estate prices

are also relevant. According to SRED (2014), average supply prices for a single family home in Oberaargau was around 611,030 francs in 2004. In 2013, the price was around 700,400 francs (SRED, 2014), which corresponds to an increase of 12.8% over the last nine years (SRED data) or 1.42% per year. Nevertheless, if one takes into account the change in construction costs, real estate prices have been slightly shrinking: in fact, the BFS (2014c) records an increase of 13.8% of construction costs over the same time period. This implies that during this time period, land hoarding was not profitable.

Price increase in the city of Berne

In comparison with the Bernese agglomeration, average supply prices for single family homes were around 758,530 in 2004 and 906,100 francs in 2013 (SRED, 2014). This corresponds to an increase of 16.29% over nine years or 1.8% per year. Thus, even if one subtracts construction costs, an added value of approximately 5% is generated.

Agricultural land price back to normal?

In regard to agricultural land, data for the Canton of Berne is not readily available. Land prices are around 8 francs/m^2 in the Canton of Zurich, the most expensive in Switzerland (Giuliani and Rieder, 2003; Neue Zürcher Zeitung, 2008)[4]. Land prices have been dropping since the 1970s and reaches nowadays a level comparable to the 1930s (Giuliani and Rieder, 2003).

Important building zone reserves...

As figure 1.6 shows, some communes have important building zone reserves. The minimum and maximum scenarios correspond to the lower and upper estimates of building zone reserves made by the ARE according to the legal criteria defining the needs of building zones[5]. In the case of Niederbipp and Thunstetten, these reserves are predominantly working zones. As a cantonal priority development area, Niederbipp proceeded to initiate important zoning operations in the 1990's and 2000's in order to develop the industrial zone; some of this designated land is still available for development. This industrial area benefits direct connection to train tracks and to the motorway. Thunstetten is adjacent to Langenthal and can be compared to a suburb of the city. It also has an important industrial zone located alongside the train line that connects Berne to Zurich, as well as the cantonal road connecting Berne to Olten.

Figure 1.6: Percentage of unused building zones in comparison to total building zones in Oberaargau (Data and map: ARE (2012). Figure: IWSB (2014)).

...mainly scattered across the settlement area

In the case of Langenthal, Roggwil, Oberbipp, Wiedlisbach and Huttwil, these building zone reserves are predominantly housing zones. These zones were defined in the 1970s and remain undeveloped since then. Most of these reserves are scattered across the building zone, i.e. they consist of single undeveloped plots. Wider undeveloped perimeters are rather uncommon. One can find them in Langenthal, Huttwil and Roggwil. The undeveloped areas of Huttwil and Wiedlisbach are analysed

[3]In order to obtain land prices, Wüest and Partner (VVYY) subtract the construction costs from the transaction price .

[4]The works of G. Giuliani are amongst the few publications mentioning agricultural land prices

[5]The size of the undeveloped building zone must correspond to the anticipated needs of the subsequent fifteen years; these needs are calculated on the basis of the cantonal population variation prognosis, of an average land surface use per person and of the average land use coefficient. See subsection 2.2.2 for further details.

further in the second part of this working paper. Further, as no data on past dimensions of building zones is available[6], only a smaller scale comparison of its evolution is possible, (found in chapter 2). These zoning patterns are of central concern, not only to understand the development dynamics in peri-urban spaces, but also because they are a decisive element for evaluating the relevance of future redistributive instruments.

Obvious incentive to put land into the building zone

Compared with the evolution of land prices over time, and taking into account that the average price of agricultural land is eight francs per square meter (the price for land for development is between 200 francs and 300 francs per square meter), the strong economic incentive to zone land becomes clear. The incentives include, for the communes, higher tax revenues[7], or for landowners in order to increase the value of their property.

1.1.3 Main rivalries and conflicts

Ecological vs. economic value?

The brief analysis in section 1.1.1 shows that since the 1980's, land use changes (in terms of construction) have occurred at a constant pace in Oberaargau. As land cover change is a central indicator of the ecological value of land, one can assert that the overall ecological value has diminished. However, development has taken place in rather localised areas, close to already developed parts of the regional territory. Subsection 1.1.2 shows a correlation between land value and zoning and emphasizes the strong incentives that exist for landowners, as well as for authorities, to have building land. Nevertheless, the development of land over the time period of the study does not allow us to conclude that the value of building land has increased. In fact, land as an asset has not been particularly profitable over the last ten years.

Rivalries between services provided by building land

Based on the classification of anthropic uses of the resource soil established by Nahrath (2003, 127), these findings can be described in terms of rivalries and conflicts between different land uses. The conflict between building land and natural areas is the most fundamental one behind the two dimensions of value discussed. However, there are also conflicts between different categories of goods and services provided by building land itself: for example, investment and land hoarding versus urbanisation or housing, or industry and handicraft versus housing, or waste disposal versus urbanisation.

Evolution of services provided by building land

Without considering external factors (discussed in section 1.2 below), there is the possibility to reuse parts of building land that no longer provide services. Swiss federal authorities estimate that former brownfields constitute an unused land reserve of approximately 1700 hectares (Swiss Confederation, 2008). These areas have already been serviced and benefit, in certain cases, from an optimal location (Jaccaud et al., 2008). Another example is the densification of already developed areas which allows for additional uses (ARE, 2013).

Redistribution of value for decontamination

However, these change of uses are constrained by law and can require significant sums. In the case of former brownfields, landowners are obligated to finance soil analysis, potential interventions and/or surveillance measures, depending on the degree and amount of pollution. As these operations might be very costly, compensation via added economic value generated by future use might not be sufficient. This particularly applies to peri-urban regions where the financial burden for decontamination that landowners or potential investors are ready to shoulder is smaller. Moreover, overall difficulties in compelling polluters to pay for their actions (actions that may have occurred decades ago), can be a cat-and-mouse game impeding quick rehabilitation of the polluted perimeter[8]. In the end, the available public funding cannot

[6] First statistics on building zones from the Federal spatial planning office (ARE) dated back to 2007.

[7] The arrival of new inhabitants, in particular, on middle or upper class homeowners, leading to higher income tax revenues for the commune. However, this has to be put into balance with additional costs such as construction and maintenance costs of serviced land, as well as public infrastructure like schools, nurseries, sports facilities, etc.

[8] Practitioners cite examples of companies that have polluted in the past and transfer their assets, filing for bankruptcy and avoiding payment for their damage. The recent introduction of article 32*d*bis of the environmental protection act tries to circumvent this problem by introducing a cost cover guarantee. Various parliamentary interpellations (14.3042 - Interpellation form Mathias Reynard; 12.3298 – Interpellation from Thomas de Courten; 12.3221 – Interpellation from Daniela Schneeberger) and a recent revision of the *Environmental protection act and the Ordinance on polluted soils* concerning the funding of depollution underline the importance of this issue.

entirely compensate for the reduced economic value[9]. Further redistributive issues include revitalization projects, such as river beds, the artificial creation of biodiversity, and even reforestation programs.

Land use planning issues requiring redistribution

Other issues, such as the reduction of oversized building zones, are also linked to the redistribution of value. In regard to the dimension of building zone, the withdrawal of development rights attached to a plot provides, under specific conditions, the right to compensation for restrictions on ownership. With the last revision of the spatial planning act, cantonal authorities now levy a tax on added value created through zoning operations in order to finance other land use planning measures (*i.e.* the reduction of building zone or other land use planning measures). This instrument introduces a redistributive mechanism at the core of land use planning policy that directly targets the rent created by public authorities. Further, land hoarding is also a redistributive issue: the rarefaction of available building land might lead to higher rents[10] which in turn fosters the creation of additional building zones in order to compensate the scarcity of supply.

In order to understand the evident rivalries and conflicts, it is necessary to first understand how economic and ecological value is created or destroyed, and second, if and how it is captured and redistributed. Having presented the main trends in land use and land use planning, the following sections aim to identify and explain the main factors influencing these trends: section 1.2 presents an analysis of contextual variables; section 2 is dedicated to policy factors determining land use planning and land use in a regional context.

[9]The federal waste fund is credited yearly with approximately 30 million francs in order to finance decontamination operations. For the period 2012 to 2015, the Bernese cantonal waste fund has an annual budget of between 2.5 and 5 million francs (Kanton Bern, 2012).

[10]However, the literature remains ambiguous on the matter (Napoléone and Geniaux, 2011).

1.2 Contextual factors

This section presents the contextual variables chosen by the project team which have strong influence on land use on a cantonal and regional scale. The first subsection (1.2.1) shows that transport infrastructure, topography, and view are correlated with land use.

The second subsection (1.2.2) exposes general economic constraints, such as the evolution of growth and employment rates. Subsection 1.2.3 presents major trends in regard to demographic evolution and urbanization. Subsection 1.2.4 deals with central polity aspects regarding the communes and political elements showing general tendencies of the region.

1.2.1 Geographic and spatial factors

Higher accessibility in the centre and north of the region

Figure 1.7 shows the criteria of accessibility via public transport, as well as the frequency of land use changes. The accessibility criteria shows that the center and northern parts of the region are more accessible than the southern parts. In matters of public transport, only the centres of Langenthal and Herzogenbuchsee achieve the second highest class of accessibility because they are located on Interregio train lines connecting them directly to Berne, Burgdorf and Olten. The Bipperamt remains relatively well connected, in the sense that the train line at the base of the Jura mountains grants them access to Solothurn in less than 30 minutes, to Oensingen, the neighbour commune of Niederbipp in canton Solothurn, in a few minutes, and to Langenthal, the regional centre, within 30 to 40 minutes. From Oensingen and Langenthal, Interregio trains offer connections to Berne in 60 and 35 minutes, and Zurich in 50 and 45 minutes (SBB, 2014).

Coordination of public transport and settlement

In regard to land use changes, the superposition of land use changes and public transport accessibility shows that an important part of development occurred close to existing public transport infrastructure. Further, development of settlement away from any public transport, (in particular in the south), appears to be less frequent in the time period of the second study. This can be interpreted in different ways: a better land use planning coordination through the tightening of restrictions, the exhaustion of building zone reserves in these communes, or punctual developments linked to agricultural use. In fact, if one compares the frequency of changes in these southern communes with the size of their building zones (1.6, it is inconceivable that entire neighbourhoods have been erected there. Another issue are the scattered light blue dots belonging to the transport categories E and F: they consist of bus stops probably established after the land was developed. Therefore, it is probable that there is a partial reverse effect, where land use determines transport accessibility.

Side effects of infrastructure development

Further analysis also shows sub-regional contrasts (see figure 1.8): the highest urban sprawl occurs in communes accessible by train, which means that urban sprawl is linked to the construction and existence of major infrastructure. In fact, one correlative effect of these transport infrastructures is an increase in the attractiveness of land for new businesses and residents, and encourage municipalities to open up more land for development. This tendency is confirmed by two interviewees who speak of the "*Ableder*" of the *Bahn 2000* project, that is to say the consequent zoning operations filling small non developed areas close to the new train line.

A rather isolated south

In regard to motorised private transport (figure 1.9), While the north and center have close access to the motorway, the south is rather isolated: the distance to the closest motorway entry can be more than 35 km away. From these slip roads, Berne, Zurich and Basel can be reached approximately within less than an hour. Compared with the frequency of land uses changes, the relationship is less obvious: one can observe a high frequency of development close to the motorway access, as well as in the centre of the region where the biggest towns are.

The bottom of the Jura as optimal housing location

As figure 1.10 shows, the northern part of the region at the base of the Jura mountains have a better view than the southern part. In this way, it is more suitable for the development of housing zones. Further, the map allows us to distinguish the topographical characteristics of the region. In turn, I can assert that firstly, settlement primarily develops where land is flat (light blue and yellow areas). Secondly, development occurs close to existing settlement, as noted before (1.1.1). Thirdly, the northern part of the region does experience important development, but it is not

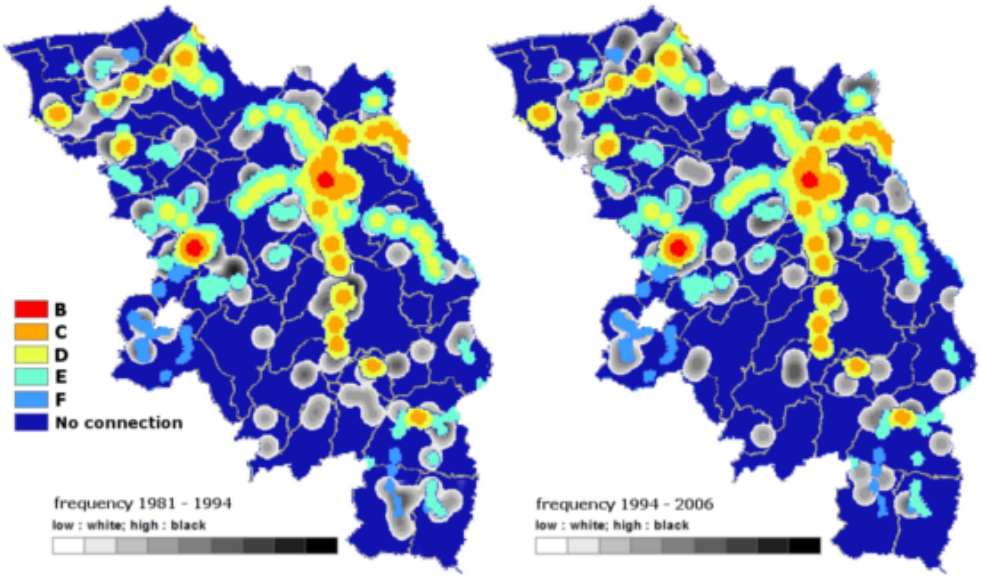
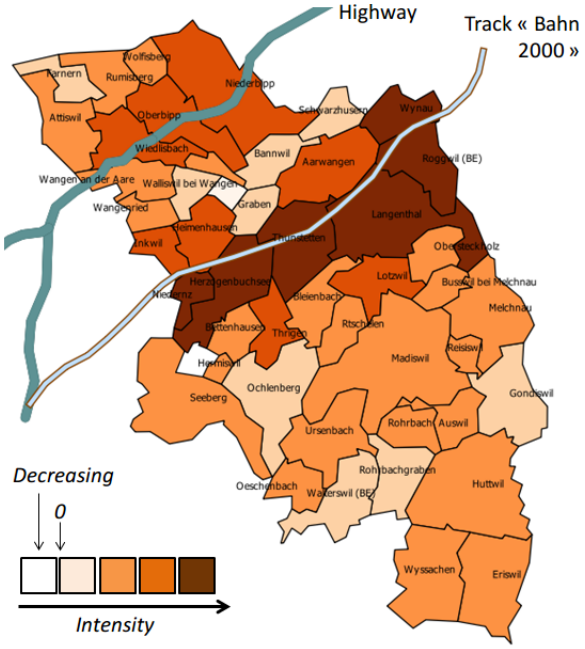


Figure 1.7: Accessibility of Oberaargau by frequency and type of service in 2014 crossed-referenced with frequency of land use changes from agricultural land to settlement from 1981 to 1994 and from 1994 to 2006. Data: BVE (2014); BFS (2014b, VVYY).

Figure 1.8: Evolution of urban sprawl compared to the size of the commune between 1981 and 2006 in Oberaargau. This sprawl includes the following land uses: buildings, transport, special facilities, recreation areas and urban green spaces. Data: Schuler and Joye (2000); BFS (2014b).



possible to attribute this to a unique cause, as on one hand transport is a relevant explanation, but on the other hand, an important industrial development occurred in the same area (see section 3.4). Furthermore, finding the source of land use changes depends heavily on the real estate developer's choice and people's lifestyle: some favour a village house on a hillside with good view, while others prefer a small-town flat with direct access to metropolitan areas.

This section shows how the main land developments occurred where the surrounding land was already built, where land is rather flat or grants a good view, and with close proximity to transport infrastructure. However, land development also influences the availability of public transport. By increasing the number of potential passengers, a reverse effect is induced. Accessibility by car blurs the link between the two variables, as the regional driving distances to the motorway access do not exceed 30 minutes. In matters of view and topography, flat land is more attractive than a slope, unless it is well oriented and grants a good view. Of course, development is also linked to developers' and individuals' choices which vary over time.

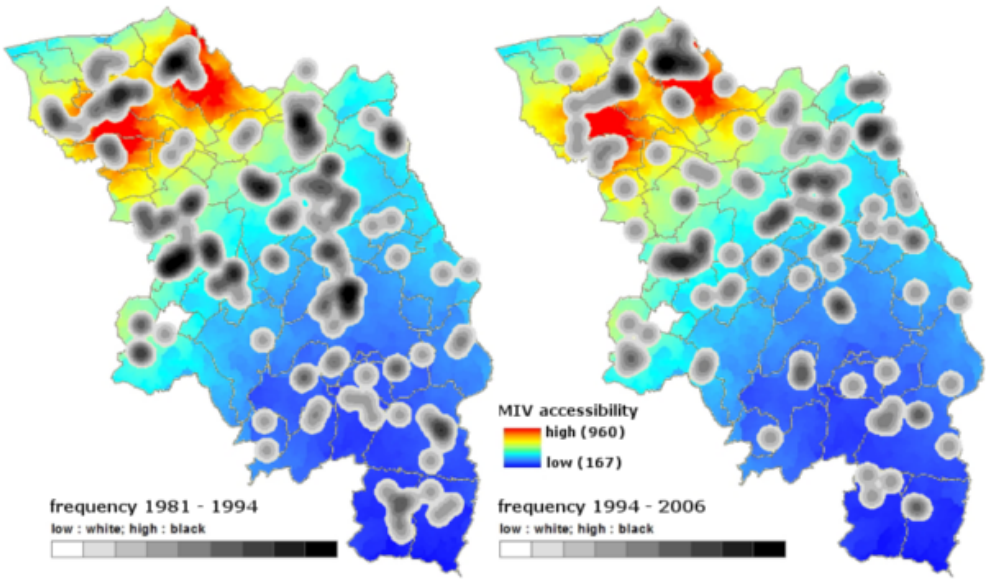


Figure 1.9: Distance to access the motorway crossed with the frequency of land use changes from agricultural land to settlement from 1981 to 1994 and from 1994 to 2006. Data: BFS (VVYY); Hochschule für Technik Rapperswil (2014a).

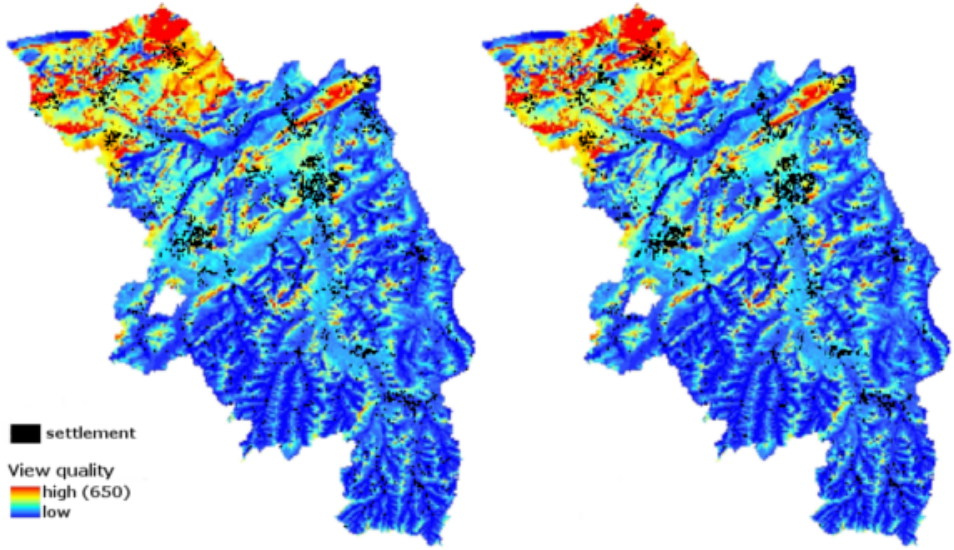


Figure 1.10: View quality in Oberaargau crossed with evolution of land use from 1981 to 1994, and from 1994 to 2006. Ratio of the area that is visible from a certain location in Oberaargau within a distance of 5 km on scale from 0 to 1,000). Data: Hochschule für Technik Rapperswil (2014b).

1.2.2 Economy, employment and fiscal factors

Economic context is an additional explanation of occurred land use changes. Regional growth and the national interest rate correlate to land value changes; the presence or absence of jobs, the fiscal attractiveness of the communes and the population's fiscal capacity[11], can partially explain the decision of individuals and companies to establish themselves in a certain location.

A richer north and a poorer south

Figure 1.11 shows that fiscal capacity is highest in the two biggest communes of Oberaargau, and that inhabitants in the northern part of the region generally have higher incomes than those in the southern part. Differences between some communes are significant, but one has to keep in mind that the communes with low fiscal capacity (< 700) are mainly agricultural: with the exception of Wyssachen (1,200) and Eriswil (1,300) – most southern communes with low fiscal capacity have less than

[11] By fiscal capacity, I understand the tax revenues of a commune, divided by the communal tax rate, divided by the number of inhabitants (LUSTAT, 2016).

1,000 inhabitants. Nevertheless, I observe that communes with a higher degree of centrality have a higher fiscal capacity.

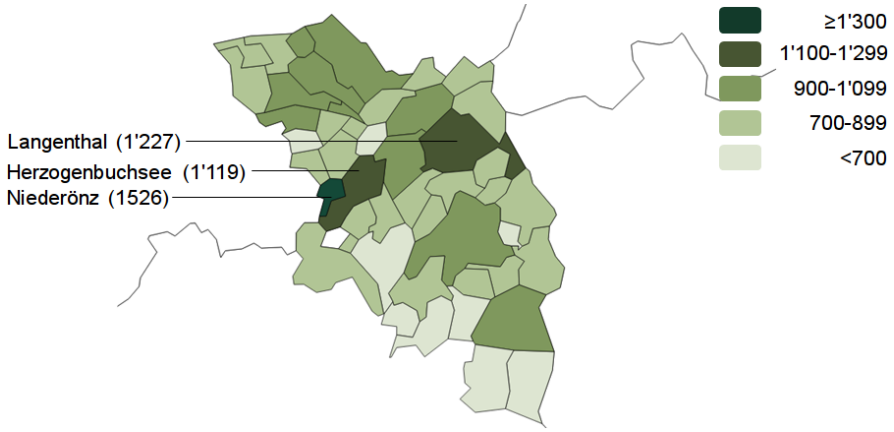


Figure 1.11: Average fiscal capacity in Swiss francs per inhabitant per commune in Oberaargau between 2009 and 2011. Data: BFS and Kanton Bern (2015). Map: BFS (2014b). Figure: IWSB (2014).

Overall lowering taxes over time

In matters of communal tax rate, one can observe that besides the general tax rate reduction – and thus general fiscal income reduction per inhabitant – over the time period considered, southern communes tend to tax their residents more than the regional average. On the contrary, the communes with a higher degree of centrality, who are experiencing more growth, push the tax rates lower. Compared to figure 1.11, one can observe that the communes with the highest fiscal capacity are among those with the lowest tax rates: Langenthal, Herzogenbuchsee and Niederönz manage to earn high revenues, with low tax rates, whereas the poorer southern communes face higher rates and lower incomes. The northern communes also take part in the tax discount with a mitigated success, as their fiscal capacity corresponds to the regional average. This allows us to assert that richer citizens of Oberaargau pay proportionally less taxes than poorer citizens.

No evident direct impact

In terms of impact on land use, a link between the level of taxation and land use planning cannot be observed, as no data on the evolution of zoning is available before 2007. In regard the link between the level of taxation and land use, no direct correlation can be shown. Further, lump sum agreements with medium or big sised companies that establish themselves in Switzerland are de facto excluded from this calculation.

Further tax competition

Figure 1.13 shows a general tendency to reduce the land tax rate (with exception of Niederönz – regional tax discount champion). The calculation of the tax paid by landowners relies on the official value – *amtliche Bewertung* – of land including its parts (such as buildings, springs...), its overall condition and its use. Therefore, the land tax does not strictly consider land value as its object, but includes improvements as a target. Further, the cantonal administration states that official land values are, compared to their market value, mostly underestimated (FIN, 2009, 10). Nevertheless, referring to the tax harmonisation act[12], case law prohibits discrepancies of 30% and more[13]. Further information is provided in section 2.2.2. In regard to the link between land tax and land use, as only the tax rate is available, (and not the real fiscal income), it is not possible to make empirical statements.

A centralised job offer

In terms of employment, figure 1.14 shows that on a regional level, there is a relatively high job to population ratio in the Bipperamt, Langenthal (and its agglomeration), and in Herzogenbuchsee/Niederönz. With the exception of Huttwil, where job supply is relatively high, the southern communes, in comparison with the others, do not offer many job opportunities. Compared to macroregional[14] and with the nation as a whole offering 401 full-time jobs per 1,000 inhabitants and 432 full-time jobs

[12] Art. 14 of the *Federal tax harmonisation act*, SR 642.14.
[13] See BGE 124 I 145
[14] The macroregion includes the Swiss Mittelland, *i.e.* the cantons of Berne, Solothurn, Fribourg, Neuchâtel and Jura. It has been chosen for reasons of data accessibility.

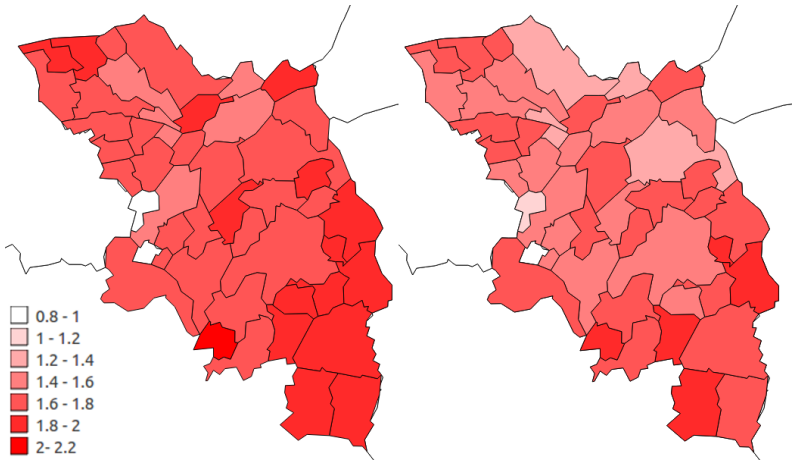


Figure 1.12: Tax rate of natural persons in the communes of Oberaargau in 2003 and 2013[a]. Data: FIN (VVYYa). Map: BFS (2014b).

[a]The tax rate is multiplied with the percentage of taxation defined by cantonal law.

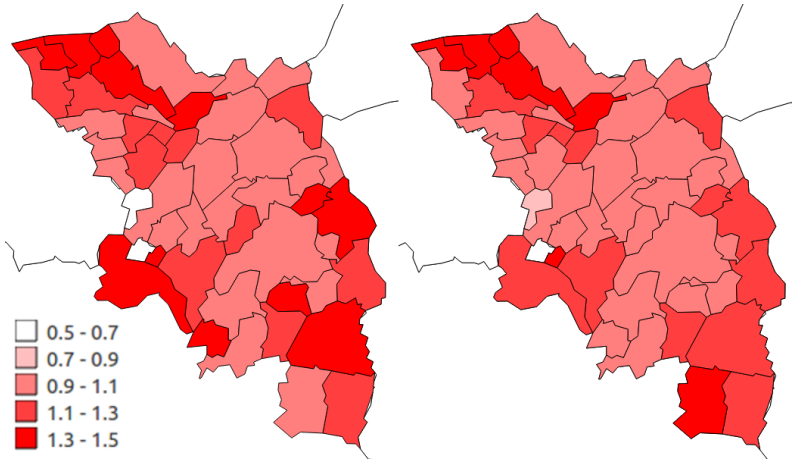


Figure 1.13: Land tax rate (as per thousand of official land value) of the communes of Oberaargau between 2003 and 2013. Data: FIN (VVYYb). Map: BFS (2014b).

per inhabitant in 2011, respectively, Oberaargau offers 411 full-time jobs, thus falling between macro-regional and national averages (see table 1.4).

Growing job opportunities in the north

If one takes a look at the evolution of jobs over the last ten years (1.15), employment tends to decrease in the south of Oberaargau. The communes around Herzogenbuchsee also lost jobs, but as the map displaying the commune typology (figure 1.4) shows, this loss seems linked more to general socio-economic transformation of these communes from rural industrial status to a residential location for commuters. On the contrary, the Bipperamt experienced a growth in job opportunities over the last decade. In the region as a whole, there are slightly more full-time equivalent jobs per capita than ten years ago, a tendency confirmed on macroregional and national levels. Nevertheless, the job increase has been higher in Oberaargau than in the macroregion.

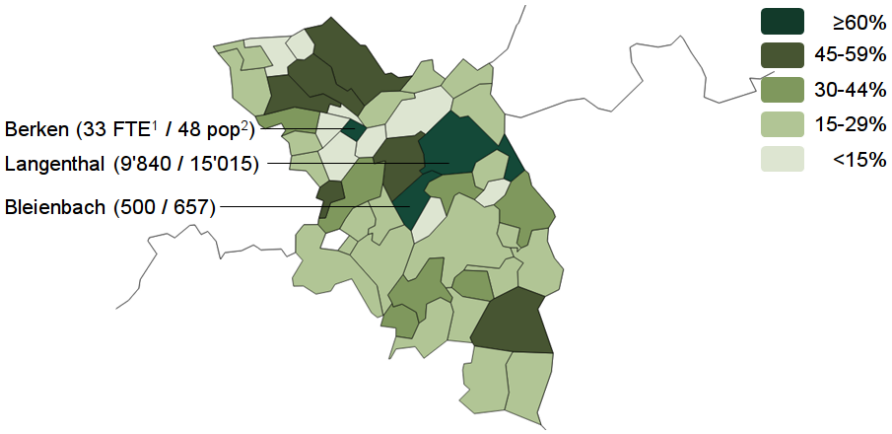


Figure 1.14: Ratio of full time equivalent jobs per inhabitant per commune in Oberaargau in 2011. Data: BFS and Kanton Bern (2015). Map: BFS (2014b). Figure: IWSB (2014).

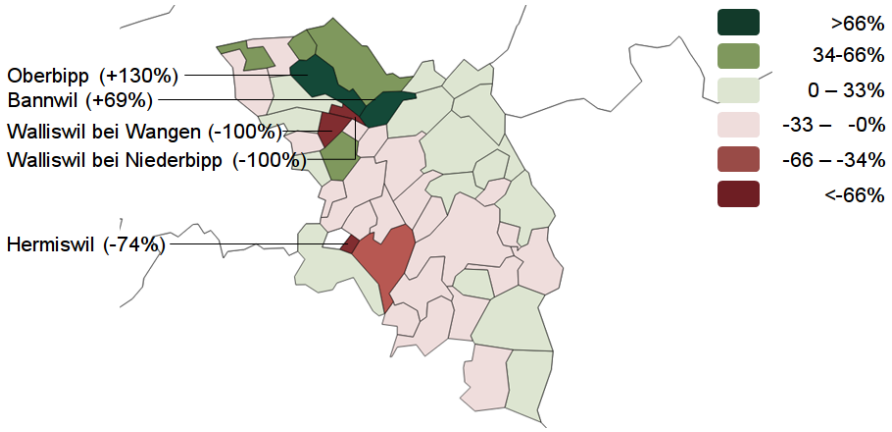


Figure 1.15: Percentual variation of jobs per inhabitant per commune between 2001 and 2011 in Oberaargau. Data: BFS and Kanton Bern (2015). Map: BFS (2014b). Figure: IWSB (2014).

	Oberaargau	Mittelland	Switzerland
Population 2001	75,305	1,667,070	7,255,653
Jobs 2001	29,159	665,700	3,134,713
Ratio	0.38	0.39	0.43
Population 2011	77,611	1,770,429	7,954,662
Jobs 2011	31,899	710,800	3,438,683
Ratio	0.41	0.40	0.43

Table 1.4: Evolution of jobs in full-time equivalents compared to regional, macroregional and national population between 2001 and 2011. Data: BFS (2014a).

Now, if I cross-examine the employment figures presented above with urban sprawl (figure 1.18) and the frequency of land use changes (figure 1.3), I see an important overlap, notably in the centre and north of the region. This means that the existence and creation of jobs also influences land development. However, as construction is an important employment sector, the inverse relationship between the two variables must also be considered.

This subsection shows that the population's average income is higher in communes with high accessibility and in most communes with higher job opportunities. Additionally, it shows that fiscal rates for natural persons and landowners have been shrinking over the last 30 years. As I can identify partial overlap between communes with low tax rates and higher job opportunities, a link between fiscal rates and land use is probable. However, important data gaps, namely in regard to the taxation of moral persons and the amount of tax retrieved from the land tax, do not allow the production of an accurate description of reality. Besides, I notice an inverted correlation between income and tax rate.

1.2.3 Demography, urbanisation and housing

Another central variable that must be considered in order to understand land use changes is demography. Although its evolution depends on factors such as housing availability and employment opportunities, it can, as such, provide insights into the regional development dynamics, and help distinguish different communal trajectories.

Between 1991 and 2013 (BFS, 2015), population in Oberaargau grew from 74,802 to 78,508 inhabitants; this corresponds to an absolute growth of 7.88% or an average annual growth rate of 0.36%. These rates are similar to the cantonal change: population grew from 927,497 to 1,001,281 inhabitants, *i.e.* 7.96% overall growth and 0.36% average annual growth. However, this growth was inferior to national population changes, which grew from 6,842,768 to 8,139,631 inhabitants, a change that corresponded to a total growth of 18.95%, or annual growth of 0.86%. Over the last ten years, annual population growth has slightly reduced in Oberaargau to approximately 0.4%, under both the cantonal average of 0.5%, and the Swiss national average of 1.05%.

	1981	Δ	**1991**	Δ	**2001**	Δ	**2011**
Oberaargau	68,790	+5.8%	72,774	+3.4%	75,305	+3.06%	77,611
C. of Berne	914,753	+2.2%	934,639	+1.2%	946,310	+4.1%	985,046
Switzerland	6,372,904	+7.3%	6,842,768	+6.0%	7,255,653	+9.6%	7,954,662

Table 1.5: Evolution of number of inhabitants in thousands in Oberaargau, the canton of Berne and Switzerland between 1981 and 2011

A look at the regional population growth (figure 1.16) shows that population tends to decrease in southern communes where agriculture is predominant, and that demographics increase in communes close to main transport infrastructure, (*i.e.* in the center and north of the region).

Classic demographic distribution

The map on the right shows that Oberaargau has one centre, Langenthal. Of several sub-centres, Herzogenbuchsee is of greatest importance. These two communes are both crossed by the main regional train line. Among the smaller centres are Niederbipp and Huttwil, both centres of the fourth category (according to the cantonal structure plan). A significant part of the population lives in the communes around Langenthal, which suggests a classic demographic distribution: one main centre and its suburbs.

Figure 1.17 shows that the vacancy rate tends to be higher in communes surrounding Langenthal, although these communes have a higher degree of centrality compared to less well located ones (more southern communes) southwards. Communes around Herzogenbuchsee (Heimenhausen, Bettenhausen, Niederönz) experiencing notable demographic growth have a low vacancy rate.

Urban sprawl mainly in the centre and north

Figure 1.18 shows that urban sprawl, (the extension of built surfaces), is higher around Langenthal, Herzogenbuchsee, and in the Bipperamt than in other parts of the region. Some of these communes have wide industrial zones (*e.g.* Niederbipp. Thunstetten), while others are characterised by low density housing zones (Wiedlisbach, Aarwangen, Oberbipp, Madiswil, Roggwil...). The communes with below

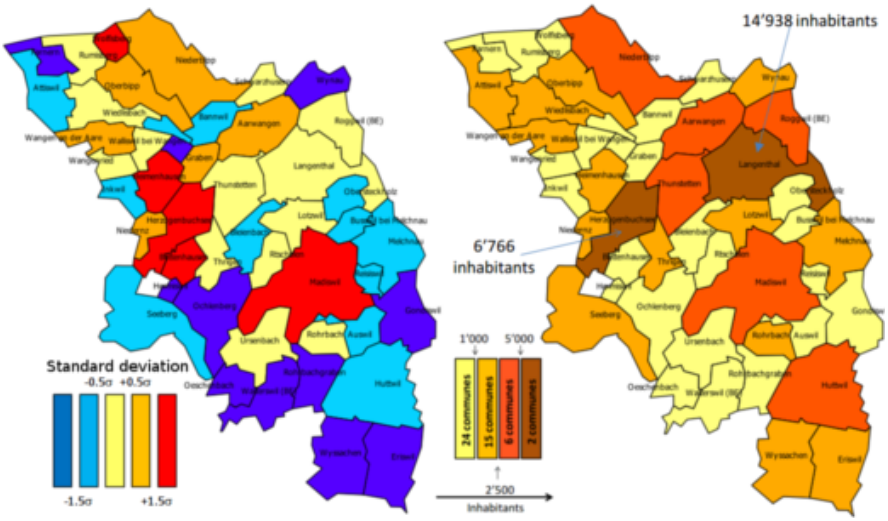
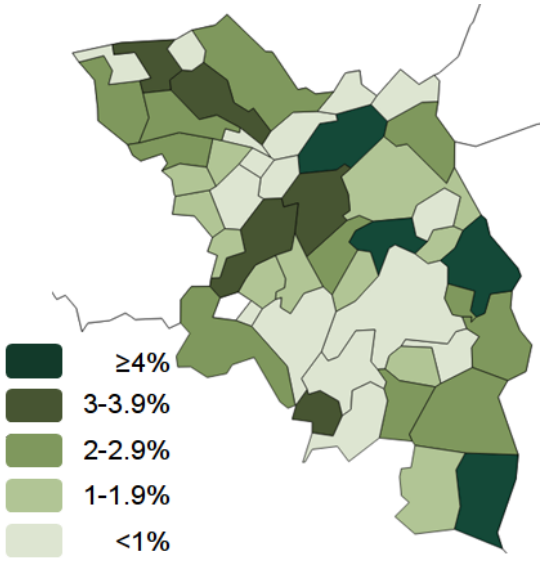
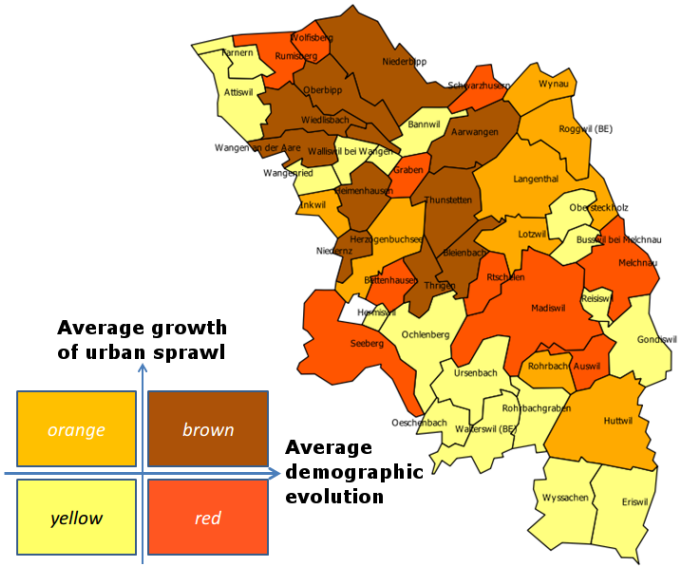


Figure 1.16: Demographic growth rate of the communes in Oberaargau from 1991 to 2011 and population of the communes in Oberaargau in 2011 (Data and map: BFS).

Figure 1.17: Vacancy rate in the communes of Oberaargau in 2011 (Data: BFS (2015). Map: BFS (2014b). Figure: IWSB (2014).





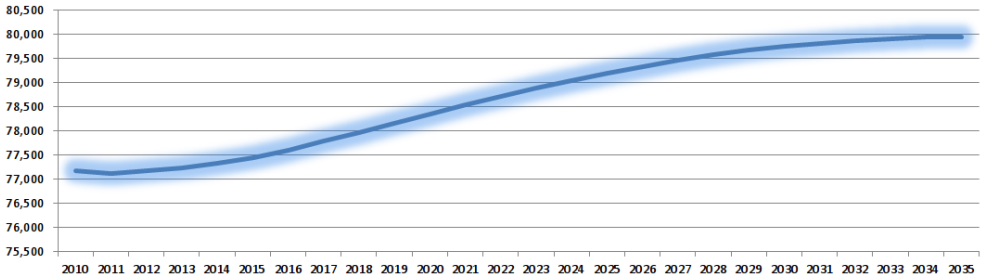


Figure 1.18: Evolution of urban sprawl between 1981 and 2006 compared to evolution of demography in Oberaargau between 1991 and 2011. Data: BFS (2015). Map: BFS (2014b).

Figure 1.19: Demographic forecast in Oberaargau until 2035. Data: Region Oberaargau and Kanton Bern (2012, 65).

average demographic change and urban sprawl are mainly agricultural communes with decreasing working opportunities (see figure 1.18).

Highest urban sprawl in already densely populated areas

Figure 1.18 shows the evolution of urban sprawl from 1981 to 2006 in comparison with the territorial size of each commune. Those with larger populations experience the highest rate of soil artificialisation, a point which supports the idea of a strengthened urban framework, a diagnosis due to the high correlation between urban sprawl intensity and the number of inhabitants[15].

Growth prognosis below cantonal and national levels

In terms of regional demographic projections, figure 1.19 shows population growth prognosis of 2,000 inhabitants (2.6%) over the next 15 years, which corresponds to a yearly increase of 0.17% (Region Oberaargau and Kanton Bern, 2012). Cantonal and national prognosis are both above this figure, as they anticipate a 2.75% growth rate over the next fifteen years (yearly increase of 0.18%) on cantonal level and 7.1% growth over the next fifteen years (yearly population increase of 0.47%) on the national level (BFS, 2014d).

Ample building zone reserves

Compared with current building zone capacities (figure 1.6), the growth forecast can be reached entirely by already zoned land. In fact, the undeveloped or partially developed capacities could support up to 6,300 additional inhabitants[16] Therefore, any building zone increase, at least in terms of housing, does not relate to actual needs, but to other factors (*i.e.* the creation of additional rent).

[15] Person's r = 0.57, after correction of data distribution with log function.

[16] Based on the building zone reserves for housing of the entire region – around 131 ha, (Region Oberaargau and Kanton Bern, 2012, 24), one can calculate its minimum host capacity by applying the reversed cantonal formula for building zone dimensioning: 130 ha * (minimum) land use coefficient of 0.3 / 140 m^2 per flat * 2.25 inhabitants per flat = 6,300 inhabitants. An additional 32 ha of mixed zone are not taken into account. See 3.2.3 for a detailed description of the calculus.

1.2.4 Polity and politics

Polity

Regional structure headed by prefect

Before 2006, the canton of Berne is composed of 26 districts and approximately 400 communes[17]. Districts are essentially administrative subdivisions used by the cantonal administration in order to accomplish various decentralised tasks (art. 93 KV). Each district is headed by a prefect elected directly by the people and under the supervision of the directorate in charge of the communes and land use planning (JGK).

Territorial reform in order to reduce costs

Following a broader cost reduction program and willing to adapt the territorial administration to the needs of agglomerations and rural regions (Kanton Bern, 2006), an administrative and judicial reform were voted, in 2006, restructuring the cantonal territory into ten districts and five regions (art. 3 KV-BE). The communes were not affected by the process. Figure 1.20 shows the composition of the new district of Oberaargau based on the former districts.

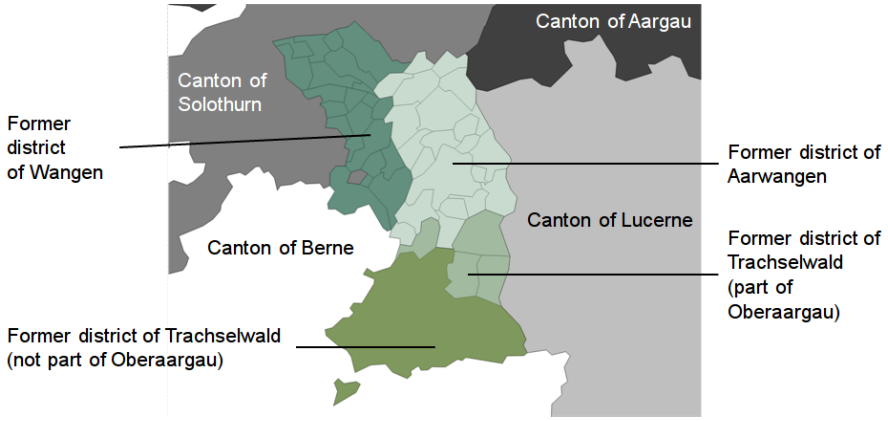


Figure 1.20: Old and new administrative setting of Oberaargau. Map: BFS (2014b). Figure: IWSB (2014).

The ten new districts are still headed by prefects, although their tasks are partly reduced[18]. They deliver building permits, state oppositions against communal decisions (except in matters of land use planning and building permits), coordinate the fire brigade, civil protection and police, mediate in civil law matters (ombudsman) and supervise public services, communes and communal associations[19].

Moderate popular support

From a political perspective, the above mentioned administrative reform was moderately supported by cantonal voters (58% of approval) and more or less rejected on the level of Oberaargau[20] (figure 1.21 below, left map). Press comments (Berner Zeitung, 2006b,c,a) mainly cited the transfer (concentration) of cantonal offices and underlying jobs from Langenthal and Aarwangen to Wangen and Burgdorf (former district of Emmental). The Swiss People's party criticised the loss of jobs to another regional centre and the general cantonal withdrawal from peripheral regions, whereas the Liberal and Socialist parties supported the reform. The location of the new prefect was subject to debate, as it is located in Wangen and not Langenthal. On the cantonal level, election results show a cleavage between urban and rural areas: whereas agglomerations (Berne, Thune, Biel) vastly approve the reform, the entire Bernese Oberland and in Oberaargau the district of Wangen reject it.

In comparison to the administrative reform (left map), the judicial reform (right map) is obviously approved, although it follows similar objectives of centralization (reduction from 13 to 4 judicial districts). Official documents provided for the voting advance as main argument the underlying federal reform of the penal and civil procedures, which reduces drastically the work-load of the affected tribunals.

[17] Number of communes in the year 2000 (Justiz-, Gemeinde- und Kirchendirektion JGK, 2014).

[18] Other reforms (Federal penal code and federal penal procedure code) take away most of their competences in matters of penal law.

[19] *Bernese law of the 28 March 2006 on prefects*, *Bernisches Gesetz vom 28. März 2006 über die Regierungsstatthalter (RStG)*, RS-BE 152.321.

[20] In the district of Aarwangen, 53% of the voters approved the reform, in the district of Wangen 48% approved, and in the district of Trachselwald (the major part of it is part of the new district of Emmental), 36% approved it (Kanton Bern, VVYY).

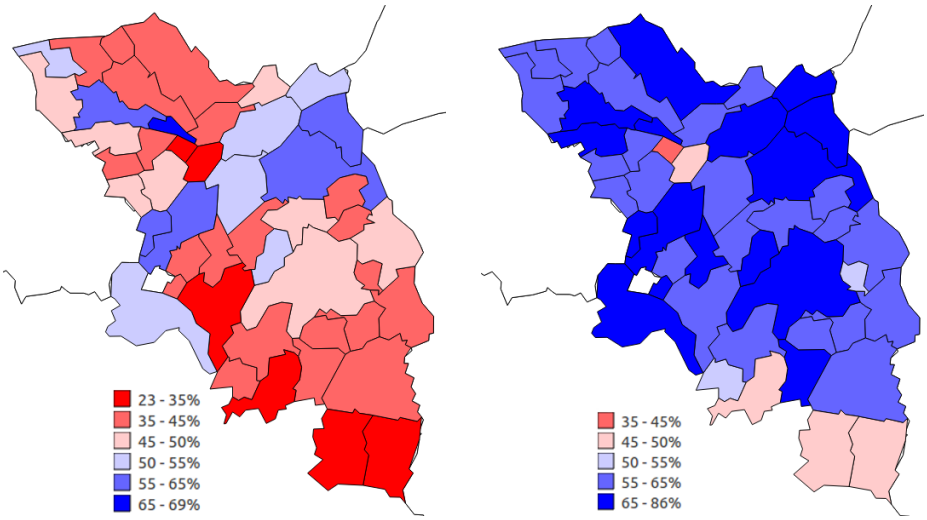


Figure 1.21: Left map: Percentage of "yes" to the reform of the decentralised cantonal administration. Right map: Percentage of "yes" to the judicial reform. Data: Kanton Bern (VVYY). Map: BFS (2014b).

Regional governance

First regional structure plan from 1980

Regional cooperation has a long standing tradition in Oberaargau: the first non-binding regional structure plan was elaborated in 1980 by the planning association *Region Oberaargau*, private law structure was founded in 1967. The aim of this plan was to "slightly deviate from uncontrolled growth and focus development more on the main centres" of the region (Ischi, 1980, 251). However, central issues fostering regional cooperation are, after all, waste disposal, traffic, and waste water treatment, not necessarily land use planning (Wyss, 1987, 297).

Pioneer role in digital land use modelling

In 1992, a revision of the regional structural plan was started (AGR, 2006), followed by the creation of an electronic simulation tool (SNL-Modell) showing probable effects of potential land use planning measures. This project was conducted with communal authorities to calculate the utility of different development options, thus showing the importance of regional planning as a means to foster growth and optimize the location of population and jobs. However, up until 2002, it was not possible to reach a state of development that met the approval of the canton, which in turn led to the integration of current modelling results into a revised classic structural plan (Region Oberaargau and Kanton Bern, 2004).

First binding coordination of transport in 1993

In 1993, the new cantonal law on public transport[21] created the legal basis for the establishment of regional transport conferences. These structures sought to bundle communal interests regarding public transport, and constitute an interlocutor between the canton and the transport companies. They could derive from private or public law. Their perimeter is defined by the cantonal executive who emphasizes the relevance of existing structures, *i.e.* planning associations (BVE, 1993).

In 2003, communes, public and private institutions, political parties and various associations elaborated and ratified the *Charta Oberaargau*. This non-binding document was originally launched as a regional agenda 21; it set global development goals in various domains such as agriculture, economic development, energy and education (AA. VV., 2003) .

In 2004, an updated regional structure plan called *Raumentwicklungskonzept Oberaargau* Region Oberaargau and Kanton Bern (2004) and based on the SNL model was elaborated. It structured and prioritised various binding measures intended to coordinate transport and settlement (definition and strengthening of priority development areas, reinforcement of public transport), but also created an ecological network, and ensured landscape protection. It also included preliminary elements of the agglomeration program of Oberaargau that applied to federal funding in 2007[22].

[21] *Gesetz vom 16. September 1993 über den öffentlichen Verkehr*, SR-BE 762.4.

[22] However, the submitted program was not considered eligible for funding by the federal land use planning office. For further information, see http://retomueller.blogspot.ch/2009/04/agglomerationsprogramm-oberaargau-ich.html.

New regional structure plan led by Canton

In 2005, as a response to a parliamentary enquiry[23], the cantonal executive decided to establish regional global transport and settlement plans, so called *Regionale Gesamtverkehr- und Siedlungskonzepte RGSK* (Region Oberaargau and Kanton Bern, 2012). These new regional structure plans were meant to integrate the agglomeration programs developed for the federal agglomerations policy initiated in 2001. The main difference between the agglomeration programs and the RGSK is that the RGSK covers the entire territory, not just cities and their suburbs. The RGSK are supposed to be elaborated by the regional conferences (see below), and, once in place, substitute the existing regional transport conferences. As for agglomeration programs, one of the central objectives is to define coordinated measures in terms of infrastructure (roads and public transport) and settlement. These measures are then verified and prioritised by the canton.

Wide popular support for new regional structure...

The underlying necessary constitutional and legal modifications were approved in 2007 by a vast majority of the Bernese people[24]. These conferences are public law structures with a set of attributed competences such as the elaboration of the regional structure plan (RGSK), the coordination of transport and urbanization, the coordination of culture, of regional politics and of energy. Their perimeter is based on the administrative regions defined by the Canton. They form a new political and institutional level, as their structure has an executive and a legislative body composed of all the communes within their perimeter. Members have voting rights proportionate to the population of their commune. Their shape is supposed to match the functional spaces on the cantonal level.

...which is rejected after all

However, their individual creation is subject to regional approval by the people in each region. In the case of Oberaargau (see figure 1.22): in 2012 this failed: the majority of voters approved the new institutional level (53.8%), but the majority of the communes rejected it (28/47). This might be surprising if compared to the overall approval of the underlying necessary institutional modifications five years earlier (Kanton Bern, VVYY). According to the press (Berner Zeitung, 2012a,b), reasons for the rejection include fear of autonomy loss (particularly in the smaller communes), refusal of centralization towards Langenthal, the binding nature of the decisions made by the conference, as well as a general resistance to propositions from Berne. Although internally divided on the matter, the Swiss People's party, eventually took a position against the conference. From an analytical point of view, one could characterize the discrepancy between the two votes as *not in my back yard* phenomenon: the problem is politically and socially recognised and the will to solve it is present, but when binding decisions implying changes in terms of coordination and competences on lower levels are to be taken, the involved actors step back and withdraw their support.

Modification of the regional association's status as middle path

In order to compensate for refusal of the regional conference, the private law planning association's statutes were modified shortly after the vote. Currently the association is in charge of (Cantonal commercial register office, 2014):

- elaboration and approval of the regional structure plan, coordination between settlement and transport infrastructure (RGSK);
- elaboration of public transport supply;
- decisions on regional programs and strategies supported by the Confederation;
- advice to the communes on energy policy;
- promotion of culture;
- Creation of regional structure plans;
- coordination of other activities such as economic development or tourism.

Nor forced membership nor effective majority voting

From an institutional point of view, the main difference between the association and the regional conference that was rejected by the voters is its private law status which impedes majority voting and forced membership. In fact, the binding character of decisions are dependant on the goodwill of each of the association's members, as

[23] Enquiry Hoffmen 164/06 (Kanton Bern, 2007).

[24] 80% approval on the cantonal level; between 71% and 76% approval in the districts of the future Oberaargau.

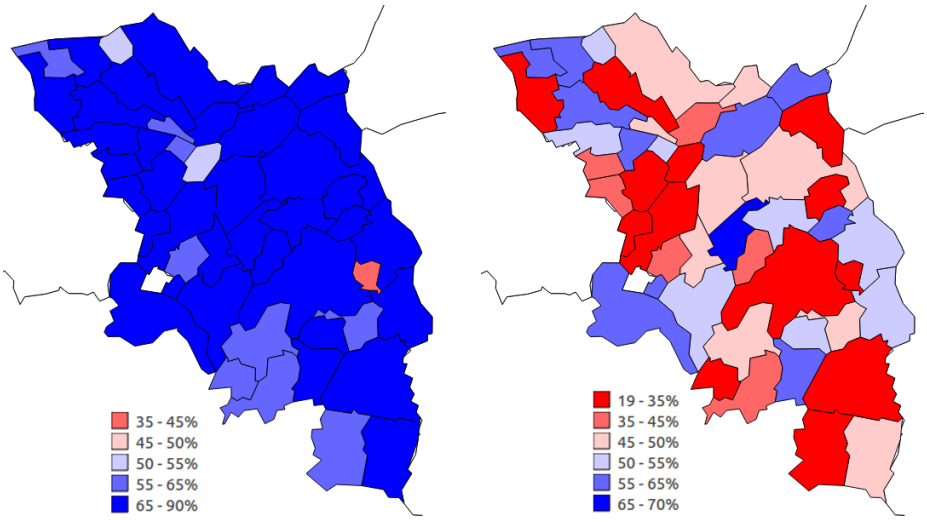


Figure 1.22: Left map: Percentage of "yes" to the agglomeration strategy and regional cooperation reform in 2007. Right map: Percentage of "yes" to the creation of a regional conference for Oberaargau in 2012. Data: Kanton Bern (VVYY). Map: BFS (2014b).

no delegation of competency is possible. The current association has an assembly composed of the chief executives of each commune, and an executive committee. Both the assembly and committee apply majority voting, but their decisions are limited to the willingness of each member to cooperate and implement the decision, as each commune can leave the association at any time.

Currently, all communes of the district are members of the association, as well as four communes from the Canton of Lucerne, the prefect of Oberaargau (president of the assembly), local members of the cantonal parliament, as well as several representatives of the regional economy (Häusler, 2012).

Communal autonomy in a general legal perspective

Limited relationship between Confederation and communes

Whereas the old Federal Constitution only sparsely referred to communal autonomy, the current one guarantees it within the limits set by cantonal law (art. 50-1 BV). One reason behind this change is the will of politicians close to the Swiss Union of Cities to foster the role of the commune as a member of the federal state and as a partner of the two other state levels Kägi-Diener (2008). However, there is no direct partnership between the federation and the communes. Instead, the federal state is supposed to involve the communes in earlier stages of the decision-making process in order to respond to growing internationalisation.

Limited judicial control of violation of communal autonomy

A violation of the autonomy of the communes is subject to constitutional complaint (art. 189-1-e BV). In order to respect cantonal competence in defining communal autonomy, only the Federal Court controls the arbitrariness of implementation of cantonal law (Kägi-Diener, 2008, 930). This court ensures that the cantonal enactment is based on serious objective reasons, and not severely incoherent or purposeless (Tschannen and Zimmerli, 2005, 166).

Wide communal autonomy in the Canton Berne

The cantonal Constitution and laws legally determine the existence of the communes, their creation and their autonomy/competency on specific matters (Zimmerli, 1995). In the Canton of Bern, this is stated in art. 3 al. 2 KV, which divides the cantonal territory into administrative units and communes. Further, article 109 KV guarantees autonomy and as wide a margin of manoeuvrability as possible, which should reflect the way cantonal laws are made. However, this principle cannot be brought to trial in court, because it is not recognised by the federal constitution (Zimmerli, 1995, 204). Nevertheless, article 111-1 KV provides that the Canton only determines the basic organisational rules of the communes.

The same provisions figure in art. 3 of the act on the communes (GG). The autonomy principle also applies to regional conferences, within the limits of their competencies (art. 137-4 GG). As defined by case law (Kuttler, 1992, 47), the cantonal authority is not allowed to cancel a justifiable communal decision, as this would correspond to a cantonal discretional control, in contradiction to the principle of

communal autonomy. One can add that communes are bound to the principle of legality, in particular in regard to acts limiting rights and liberties of the individual (Zimmerli, 1995, 210).

Competencies of the Canton and the communes

No explicit subsidiarity principle

The cantonal constitution allows the communes to accomplish a task as long as it is not of the exclusive competency of the canton. It does not require a constitutional basis in order for a commune to accomplish a (new) specific task (Zimmerli, 1995, 209). Nevertheless, as the subsidiarity principle is not mentioned in the constitution, the canton can fulfill tasks that it can handle better than the communes and further tasks not in hand of the communes that it deems relevant.

Competences shared between canton and communes (art. 31ff KV)	Environmental, animal and plant protection, landscape and heritage protection, land use planning, transport, water and energy supply, water and waste disposal, public order and security, health, education, leisure, sports and economy.
Exclusive competences of the federal and cantonal level	Agriculture, forestry...

Table 1.6: Competences shared between the canton and the communes in the canton of Berne.

Coordination in matters of tax law: Real estate gains tax (2-1-d StHG) Land property tax (2-1-a StHG) Income tax (2-1-a StHG)

Communal autonomy in land use planning

Communes are granted a wide decisional autonomy

In regard to land use planning, the federal law states that the planning authorities must grant to subordinate authorities (the communes) the needed discretion to fulfill their obligations (art. 2-3 RPG). This guarantee is a factor in the cantonal construction law, where discretion of subordinate authorities (communes, prefects), communal autonomy, and individual freedom (in terms of construction) can be restrained only when public interest (Gemeinwohl) requires it (art. 54-3 BauG). Furthermore, article 65 BauG states that the communes are, within the limits of the law, free to define their building regulations. In case they fail to do so, the cantonal authority can refuse their approval, set a deadline for adapting them, or act through substitutive execution.

Few judicial conflicts between Canton and communes

Few cases of opposition of the commune against a cantonal decision can be cited. Most concern effective use of zones: the conformity of building or exploitation permits to zoning regulations. In this domain, communes enjoy a wide decisional discretion within the limits of superior law. They are allowed to define their own zones and regulations, and interpret the regulations they make, as long as their argument is legally defensible (Bernese cantonal administrative tribunal, 2000). One of the few Bernese cases where a conflict emerges, dates from 1988: the canton established a reserved zone[25] in the middle of a constructed area still used for agriculture. The cantonal objective was to impose on the commune a higher density for future construction in the concerned area. The commune relied on the notion of communal autonomy as a means to contest the cantonal decision, the court ruled that the establishment of a reserved zone in this area contradicted the purpose of the zone, to protect agricultural land, as well as the decisional autonomy of the commune (BGE 114 IA 295).

Intercommunal cooperation and horizontal constraints

Article 110 KV states that cooperation between communes relies on free will, the possible legal forms of cooperation being determined by law: contract, association, public or private law structure (art. 7 GG). The participatory rights of citizens and communal authorities must be preserved. The Canton fosters cooperation through financial/infrastructural incentives, or by being member of a cooperation structure.

[25] A reserved zone (*Planungszone*) is a localised restriction prohibiting any use that could hamper the future use of the concerned perimeter. It is used *temporarily* while the regular zoning and building regulations are being modified.

Finally, the parliament can further decide upon mandatory cooperation *e.g.* for waste water treatment (110-2 KV, 8 GG). Matters of land use planning, regional coordination of communal building regulations (particularly zoning plans), are managed by the regional structure plan which lists the main housing and working areas of the region (Region Oberaargau and Kanton Bern, 2012, 124).

Binding regional structure plans

With the revision of the Baugesetz in 2004, article 57 BauG makes regional structure plans binding for communal authorities (Kanton Bern, 2004, 1424ff). Before 2004, there was no legal obligation for the communes to integrate the regional structure plan into their local policy. However, in terms of development, their content is essentially a transposition of communal land use planning policy into an overarching document. For example, the regional structure plan of Oberaargau lists the main undeveloped building zones and their development capacities as well as general development objectives such as "foster development alongside existing public transport" or "foster availability of building zones". In the regions where a regional conference has been approved, the option for creating regional development plans which override communal regulations and are binding for landowners, has not yet been used.

Voluntary regional structure plans

Furthermore, in the Bipperamt, an inter-cantonal partial regional structure plan *Interkantonale Gesamtstudie Siedlung, Verkehr, Wirtschaft Raum Wangen a/Aaare – Oensingen (GWO)* is currently under development (AGR and AfR, 2010). It is supervised by the canton and involves the communes from Oensingen (SO) to Wangen an der Aare. Until now, only a convention between the cantons and the involved communes has been signed (Region Oberaargau and Kanton Bern, 2012). However, the plan's process depends on the degree of cooperation between the communes. In an example of the low inter-communal cooperation, it has taken more than four years to get all of the communes to sign the convention[26] (Aargauer Zeitung, 2010; Solothurner Zeitung, 2014). Nevertheless, a closer communication and an embryonic cooperation do exist.

Langenthal's minimum cooperation project already difficult to implement

Currently, the city of Langenthal and the surrounding communes, under the leadership of the regional association, are working together to define shared specialised working zones (Agglomerationskonferenz Langenthal, 2010): the definition, coordination and promotion of new working zones are their only joint tasks. The actual zoning operations and plot equipment as well as other costs or fiscal revenues remain in communal hands. The ideas behind this are to delimit fixed working areas, (each potentially hosting specific types of companies), avoid zoning other working areas, and deny acceptance to companies which contradict the development objectives of each working area[27]. Although the requisite cooperation levels have been reduced to a minimum, the project's implementation is blocked by the contradictory views of the communes and now mainly focuses on a common working zone for Langenthal and Thunstetten only (Commune of Langenthal, 2013).

Other forms of cooperation

There are various domains of intercommunal cooperation in Oberaargau. The yearbook of Oberaargau (Lerch, 1999, 181ff) mentions 20 associations, companies, and other structures where communes work together in the former district of Aarwangen. The most important of these are: water supply (Gemeindeverband WUL), civil protection (ZAR AG), water treatment (ZALA AG) fire surveillance/protection, waste management, management of shooting ranges, and administrative and information technology support during elections.

[26] In 2010, Oberbipp, Wiedlisbach and Wangen an der Aare refused to sign the convention.

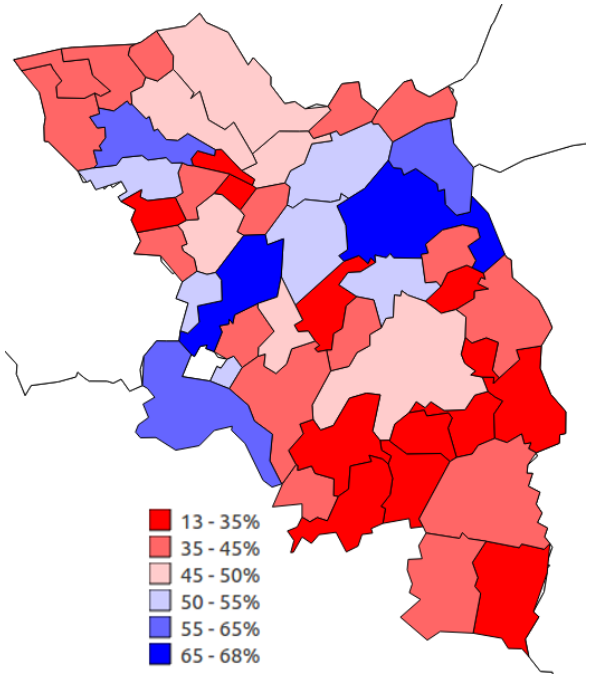
[27] Each working area has been attributed one or several development tendencies according to its location, existing equipment and surrounding population: job oriented, transport oriented, retail oriented or food retail oriented (Agglomerationskonferenz Langenthal, 2010, 19)

Fusion of communes

NIMBY-like problem for fusions

Since the 2012 revision of the Constitution (art. 108 KV) and the law on the communes (art. 4bff GG), there has been the possibility for cantonal authorities to force fusion between communes. As the voting results in figure 1.23 show, popular will to merge the two biggest regional centres with their suburban communes is present. However, the idea was not pushed forward politically. he vote results on the regional conference do not bode well for the support of a decisive vote on fusion.

Figure 1.23: Percentage of "yes" to the revision of the cantonal law on the communes in 2012. Data: Kanton Bern (VVYY). Map: BFS (2014b).



Additional political results

Dominance of right wing parties

Figure 1.24 shows the election results of the cantonal legislative elections in Oberaargau and in the entire canton over the last 25 years. One can see the dominant position of the right wing parties, in particular, the Swiss people's party, with between 40 and 55% of the votes. Over the studied time span, the socialist party lost about 10% of their votes, currently leaving them with around 20% of the voters' preferences.

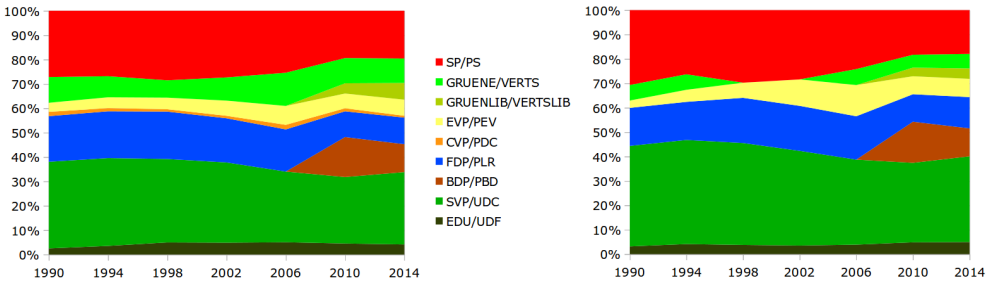


Figure 1.24: Percentage of vote for main parties for the elections of the Bernese legislative between 1990 and 2014. Left: results for the entire Canton of Berne. Right: Results for Oberaargau. Data: Kanton Bern (VVYY). Map: BFS (2014b).

In regard to voting, the 2012 revision of the federal spatial planning act was widely approved, notably in the two biggest (urban) communes. The results of the vote on secondary homes (Weber initiative) provided more of a contrast, although the region is not directly concerned by the problem of secondary homes.

As this subsection shows, recent territorial reforms reshape the administrative setting, but lack actual political support. One example of this lack of support is the refusal by popular vote of the creation of a new regional body. Regional cooperation has existed for several decades, but the regional structure plan has been binding for

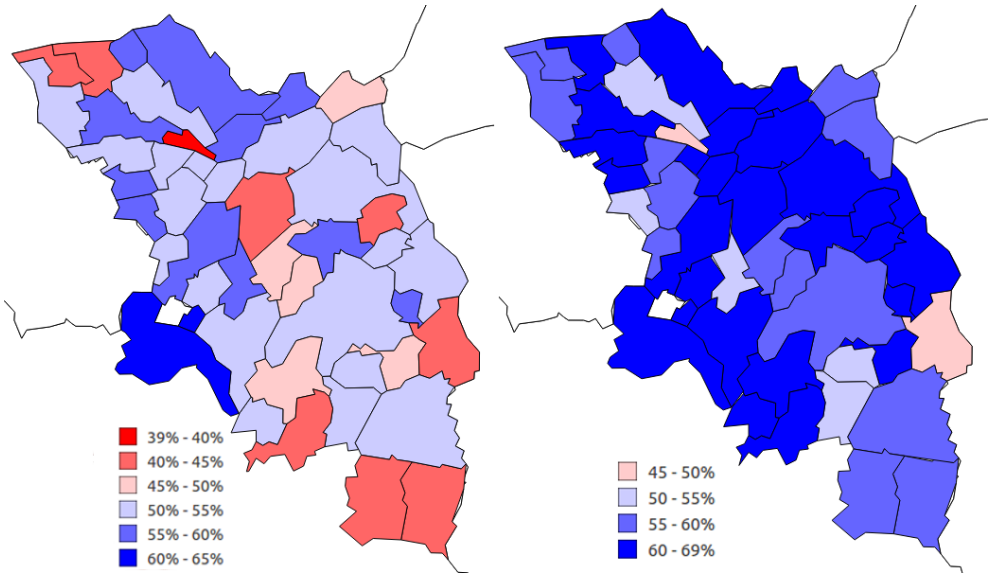


Figure 1.25: Left: percentage of "yes" on the revision of the federal spatial planning act. Right: percentage of "yes" on the initiative on secondary homes (Weber initiative). Data: Kanton Bern (VVYY). Map: BFS (2014b).

the authorities only since 2004. The plan's approval requires unanimous decision by the 47 communes of the region, a fact that hampers coordination. Further, case law shows that communal autonomy in land use planning is high and that most conflicts are settled during the approval procedure of planning documents. Therefore, even if the communes cooperate in numerous domains, and a decisive step towards regional governance has been taken by the canton, the communes' autonomy, in terms of land use planning, remains strong.

1.2.5 Synthesis

Main factors influencing land use

The contextual factors analysed in this section have shown several links with land use planning and land use. This subsection intends to summarize this information.

- First, Spatial factors are central in the explanation of land use. A location's topographic characteristics play a central role in the evolution of its use: flat land, existing settlement and view are important explanatory factors. Further, transport infrastructure, specifically public transport, correlates with the extension of settlement.
- Second, economic factors show that urbanisation correlates with higher employment, lower tax rates and higher fiscal capacity: Langenthal and Herzogenbuchsee, the two main regional centres, which also benefit of the better public transport connection, clearly demonstrate this phenomenon.
- Third, the demographic variable shows a positive link with land use. Further, it allows us to appraise whether certain communes managed demographic growth with less urban sprawl than others.
- Fourth, polity elements show the highly decentralised decisional structure in land use planning policy. Despite a progressive regional coordination of transport and settlement, binding measures for communal authorities and landowners remain scarce. Political analysis shows a voting paradox where consolidated regional structures are wanted, but not in one's own region.

Increased land consumption

The joint appraisal of these elements might provide a rather deterministic view of the evolution of land use. Unfortunately, due to a lack of data, the impact of these factors on the evolution of land use planning, particularly on the evolution of undeveloped building zones, cannot be analysed in a similar way. Nevertheless, one can assert that there is a general tendency to increase land consumption, which

can be explained by transport accessibility, a growing economy, lower taxes, growing demographic and decentralised decision-making.

Having analysed contextual variables, I move on to the legal-institutional aspects regulating land use planning and land use. These elements influence both indirectly and directly, the attribution of use rights to landowners and the evolution of land use. They consist of the different laws regulating the use of the resource soil.

Chapter 2

Institutional regime of soil

This section presents the institutional regime of soil as intermediary variables (see appendix), composed of the property rights system as well as the public policies dealing with land use planning and land use as well as the institutional rules and procedures applying to the resource soil.

2.1 Property rights

A private definition of property

The property rights system is defined as "all of the formal property rights, as well as all of the rights of disposal and use arising from them, that apply to a resource" (Knoepfel et al., 2007, 481). The content of formal, disposal and use rights depend on the definition of property used by society and applicable to the resource. For Switzerland, it is given by article 641 of the Civil code from 1912 and is formulated as follows: "the owner of an object is free to dispose of it as he or she sees fit within the limits of the law. He or she has the right to reclaim it from anyone withholding it from him or her, and to protect it against any unwarranted interference". This definition is, from a legal perspective, private (Leimbacher and Perler, 2000): notwithstanding the type of owner (state, collective, individual), the same and only definition of property applies. However, the state's activities are based on and limited by law[1] and its freedom of contract is bound to public interest (Moor, 2002, 375, 388).

Few legal changes over time

Table 2.1 shows the main modifications of the property rights system and restrictions through public law since its introduction on federal level. One can observe that the formal rights associated with property have not changed much since the second world war: they were extended to condominiums/freehold apartments in 1963 and introduced into public law in 1969 with the attribution to the federal state of a competency in land use planning. Based on the Civil code and Code of obligations, table 2.2 lists the existing property rights instruments applying to the resource soil.

[1] Art. 5 of the *Federal Constitution of the Swiss Confederation*, SR 101.

Formal rights	Disposal rights	Use rights
	1911 to 1965	
1912: Introduction of the Swiss civil code **1930:** Federal expropriation act **1963:** Introduction of condominium property into civil code	**1911:** Swiss code of obligations **1951:** Revision of agriculture act and modification of land betterment provisions	—
1965 to 1980: Emergence of federal land use planning policy		
1969: constitutional articles 22^{ter} and $22^{quarter}$ regarding guarantee of private property and principle of land use planning	—	**1970:** Cantonal constructions act **1971:** New federal water protection act **1972:** Emergency federal decree on land use planning **1979:** Federal spatial planning act
1980 to today: Environmental policy, restrictions for agricultural land and foreigners		
—	**1983:** Federal act on acquisition of property by foreigners **1991:** Federal act on rural land rights **2012:** Limitation of secondary homes to 20%	**1983:** Federal environmental protection act **1985:** Revision of the cantonal construction act **1987:** Constitutional article 22^{sexies} regarding the protection of swamps (popular initiative Rothenthurm) **1999:** Revision of federal spatial planning act in regard to constructions in the agricultural zone **2012:** Revision of the federal spatial planning act and reintroduction of a compensation mechanism

Table 2.1: Evolution of the property rights system of the resource soil according to S. Nahrath (2003, 151ff).

Instrument	Description
Private law contract (1, 216 CO)	Can contain any obligation that is not prohibited by law. Has to be done as a public deed.
Land exchange (237 CO)	Swap of land for something that is not money. Same rules as for contracts apply.
Land buy/sell (656, 666, 184 CO)	Same rules as for contracts apply.
Repurchase right (216 CO)	Seller's right to re-buy sold land at a predetermined moment. Same rules as for contracts apply, except that its duration is limited to 25 years and that it can only be inherited but not assigned.
Emption right (216 CO)	Holder's right to buy land at any moment. Its duration is limited to 10 years and must be done as a public deed.
Preemption right (216 CO, 681 CC)	Holder's preferential right to buy a property when the owner sells it. Can be defined by contract or by law, *e.g.* co-owner, emphyteutic lease holder, a farmer's family member under specific conditions, State of Geneva.
Distinct and permanent building right/emphyteutic lease (779 CC)	Holder's right to use the land according to the conditions specified in the contract with the landowner. Transferable and inheritable, unless otherwise agreed, only valid if done as a public deed.
Land improvement/betterment (703 CC)	Redefinition of property geometry, service and development. Requires the approval of the majority of landowners owning more than half of the land involved. Cantonal legislation regulates the matter further.
Real burden (782 CC)	A real burden is a monetary obligation of a landowner towards a third party for services provided to his/her land. It can be defined by contract or by law.
Gift/donation (239 CO)	Can be made within the limits set by matrimonial property law and inheritance law.
(Legal) Mortgage (824 CC)	Charge on immovable property guaranteeing a debt. It can be defined by contract or by law (legal mortgages). Mortgages are constituted through their land registry entry. *Bernese specificity:* legal mortgages are valid without inscription in land registry (109ff EZGB)
Mortgage certificate (842 CC)	Personal debt secured by a charge on an immovable property and all personal belongings. It is incorporated into a exchangeable security.
Land charge certificate (847 CC)	Credit in form of a charge on immovable property. It is disconnected from any personal obligation.
Encroachment (art. 674-3 CC)	Construction using a neighbour's land.
Right for pipes (art. 691 CC)	Pipes crossing a neighbour's land.
Rights of way (art. 694 CC)	Right to pass through a neighbour's land to access one's own land.
Right to use an essential water source (art. 710 CC)	If access to water requires excessively high costs, a landowner can claim access to one's part of water that is unused.
Usufruct (art. 745 CC)	Use rights of land granted to a natural person or legal entity that cannot exceed 100 years.

Table 2.2: Property rights instruments of the resource soil. Data: Haefliger (nd); Convers (2012); Canton de Neuchâtel (2015).

2.2 Policy design

Public law affecting the use of a resource

This subsection presents the general policy design of the resource soil. As defined in the literature, the policy design contains "all of the substantial and institutional elements relative to the programming and implementation of all use and protection policies affecting the management of a resource" (Knoepfel et al., 2007, 475). It is composed of four elements analysed thereafter:

1. The definition of the collective problem(s) to be solved and the causal and intervention hypotheses (see 2.2.1) as well as the target groups and beneficiaries (figure 2.1);
2. The political administrative program (see 2.2.2), which itself includes the legal objectives of the public policies, the evaluative elements, instruments at hand, the political-administrative arrangement and the procedural constraints;
3. The action plans;
4. The public policy outputs.

2.2.1 Collective problem and underlying hypotheses

Conflict between public policies and property rights

Figure 2.1 provides a framework in order to identify the main actors involved in land use planning policy, *i.e.* the ones causing the public problem the policy aims to solve (target group), the ones bearing the consequences of the public problem (end beneficiaries) and the political-administrative authorities intervening on the target group. As the attribution of rights on land are defined by a private property regime, the main target group of the policy are the landowners and the persons holding rights associated with the ownership of land, *i.e.* formal property title holders, disposal and use rights holders. These parties oppose public intervention, often with success, as the relation between unconditional private ownership and more and more restrictive public intervention remains ambiguous (Knoepfel and Nahrath, 2014, 771).

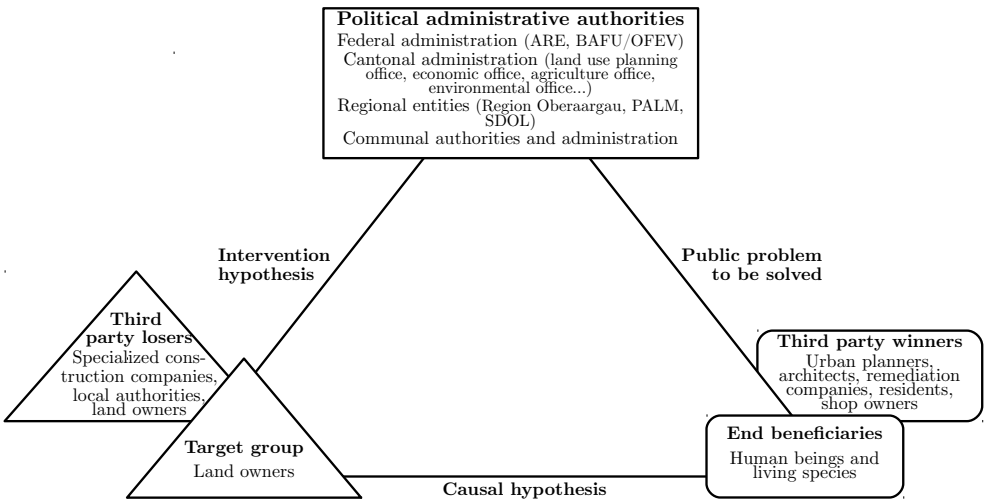


Figure 2.1: Triangle of actors of land use planning policy. Based on Knoepfel et al. (2006, 62)

A collective problem that is twofold

In matters of soil, state intervention is directed towards the target group responsible for the public problem to be solved, which is twofold: on one hand, the "economic use of land and its properly ordered settlement"[2], on the other hand the "protection of the population and its natural environment against damage or nuisance"[3]. The three tables 2.3, 2.4 and 2.5 sum up the successive definitions of the collective problems; causal and intervention hypothesis based on the work of S. Nahrath (2003).

[2] Art. 75 of the *Constitution of 18 April 1999 of the Swiss Confederation*, SR 101.
[3] Art. 73 Cst, SR 101.

Legal bases		Collective problem and causal hypothesis	Intervention hypothesis
		from 1972 to 1983	
Federal level: **1972:** Urgent federal decree freezing zoning in and forcing zoning out operations **1979:** spatial planning act	**Cantonal level:** **1970:** Cantonal constructions act	**Collective problem:** Lack of coordination between the diversity of uses and user groups that makes a quantitative protection of land (appropriate and economic use) impossible. **Causal hypothesis:** If land uses are better coordinated and some land uses restricted, then the protection of land is secured against overexploitation.	**Intervention hypothesis:** If land uses and user groups need to be coordinated, policies affecting soil uses also need to be coordinated and rules defining use possibilities for each parcel have to be set.

Table 2.3: Evolution of the public problem and of causal and intervention hypothesis in land use planning policy from 1972 to 1983 based on S. Nahrath (2003, 163ff).

Legal bases		Collective problem and causal hypothesis	Intervention hypothesis
		from 1983 to 2014	
Federal level: **1983:** Environmental protection act **1985:** Ordinance on air pollution control **1986:** Ordinance on dangerous substances and preparations **1987:** Constitutional article 22^{sexies} regarding the protection of swamps (popular initiative Rothenthurm) **1990:** Ordinance on waste, tax harmonization act **1991:** Act on rural land rights and act on forests **1992:** Revision of the agriculture act **1993:** Ordinance on additional direct payments in agriculture **1996:** Ordinance on payments for ecological services **1997:** Revision of the environmental protection act **1998:** Ordinance on direct payments in agriculture; ordinance on the depollution of contaminated sites; ordinance on the pollution of soil; water protection ordinance **1999:** Revision of the spatial planning act **2000:** Dangerous substances and preparations act **2004:** Partial attribution of gas tax revenues to transport and infrastructure measures in towns and agglomerations; revision of the agriculture act **2005:** Ordinance on risks reduction linked to chemical products	**Cantonal level:** **1985:** Revision of the cantonal constructions act **1992:** Cantonal nature protection act **1996:** Cantonal water supply act; cantonal water protection act **2003:** Waste act **2007:** Revision of the act on the communes and development of regional transport and settlement plans **2012:** Revision of the act on the communes in order to foster communal fusions	**Collective problem:** Lack of qualitative protection of soils that prevents erosion and chemical hazard, ensures their capacity to renew themselves and furnishes expected services such as fertility or water filtration. **Main causal hypothesis:** If qualitative land uses are restricted – sometimes against compensation – and rare biotopes protected, then the qualitative protection of the resource and of biodiversity as well as its sustainable use are secured.	**Intervention hypothesis:** If soil quality has to be better protected, than tighter use restrictions linked with financial compensation systems have to be defined.

Table 2.4: Evolution of the public problem and of causal and intervention hypothesis in land use planning policy from 1983 to 2014 based on S. Nahrath (2003, 163ff).

Legal bases		Collective problem and causal hypothesis	Intervention hypothesis
		from 2014 to today	
Federal level: **2012:** limitation of secondary homes to 20% per commune (popular initiative Weber) **2012:** Revision of the spatial planning act **2013:** Revision of environmental protection act	**Cantonal level:** —	**Collective problem:** Lack of compensation for the advantages and disadvantages conceded through zoning leads to a suboptimal allocation of building zones and hampers any relocation of rights. **Causal hypothesis:** If a part of the added value created through the zoning in of plots is taxed, it can be reused in order to finance the zoning out of other plots and thus reduce oversized building zones, relocate building rights and use soil more efficiently.	**Intervention hypothesis:** If building zones have to be relocated, reduced in specific areas and extended in others, mechanisms compensating added and reduced values for landowners are to be implemented.

Table 2.5: Evolution of the public problem and of causal and intervention hypothesis in land use planning policy from 2014 to 2016 based on S. Nahrath (2003, 163ff).

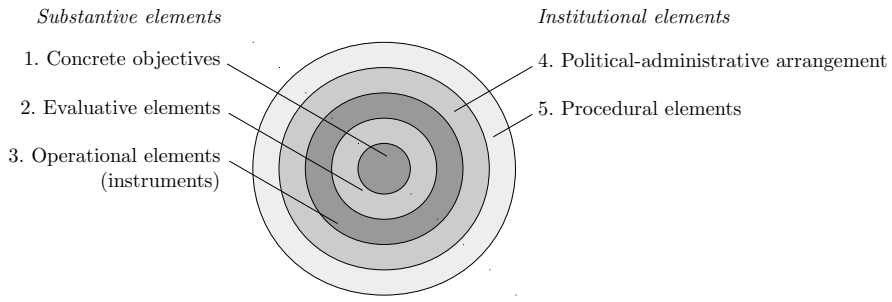


Figure 2.2: The five elements of the political administrative program according to Knoepfel and Weidner (1982).

2.2.2 Political administrative program

In order to more precisely comprehend the definition of the collective problem(s), the causal and the intervention hypotheses presented above, one has to analyse in detail the legal elements on which they rely. Together, these legal elements constitute the political administrative program: *i.e.* "the set of regulatory acts and norms that parliaments, governments and the authorities charged with execution consider necessary for the implementation of a public policy" (Knoepfel et al., 2011). This set of regulations vary according to their level of detail, centrality, and coherence. Theory distinguishes between substantial elements and institutional elements. Substantial elements consist of objectives, evaluative elements and operational elements, while institutional elements include procedural aspects and political-administrative arrangements (Knoepfel et al., 2011, 153ff). This section presents the five layers constituting the political administrative program of the policy design of the resource soil.

Policy objectives

Federal objectives: the Constitution

Article 2, 73 and 75 of the Federal Constitution[4] state that the Confederation pursues a sustainable development and "an appropriate and economic use of the land and its properly ordered settlement". Further, article 74 foresees that the state protects "population and its natural environment against damage or nuisance" and that those causing the damage or nuisance bear the costs of avoiding or eliminating it.

Spatial planning act

The federal spatial planning act[5] aims to separate building zones and non-building zones in order to prevent urban sprawl, to preserve the landscape and reduce the loss of fertile land, in particular of cropland. This act requires coherence between zoning and localization of actual uses, an optimization of building zones (in terms of size and density), a decentralised concentration of urbanization, and the preservation of regional equilibria (Nahrath, 2003; Bovay, 2005).

Environmental protection act

The environmental protection act aims to make the polluter bear the costs of the pollution, ensure the environmental compatibility of land development projects, limit emissions and imissions, restrain the use and disposal of dangerous products, organisms and waste, and remediate contaminated sites[6].

Nature protection act

The nature protection act[7] aims to protect landscape and localities, natural sites and monuments (art. 1) as well as floral and faunistic species[8], promote their conservation and foster their maintenance.

Bernese objectives

In cantonal legislation, these objectives are implemented through the cantonal structure plan, which has to be approved by the Confederation[9], the constructions act, as well as the environmental and nature protection acts. For the canton of Berne, the structure plan further specifies the aim of an "economic use of soil" through three central elements (Kanton Bern, 2011):

[4] SR 101.
[5] Art. 1 and 3 RPG, SR 700
[6] Art. 1, 2, 11, 13, 16ff EPA, SR 814.0.
[7] *Nature protection act of the 1 July 1966*, SR 451.
[8] Art. 18 NPA, SR 451.
[9] Art. 6ff RPG, SR 700.

– The coordinated development of transport and settlement, which can be achieved by the correct location, dimension and density of building zones as well as their connection to public transport;

– The creation of conditions for economic development, mainly through the creation of well coordinated and located strategic working zones and priority development areas[10];

– The preservation and development of nature and landscape, mainly through *e.g.* the protection of cropland and the definition of sites, landscapes and buildings worthy of protection.

Objectives of Oberaargau

In the region of Oberaargau, the regional structure plan, the global transport and settlement plan, and the landscape protection plan, are all approved by the cantonal authority, mention following elements:

– The definition of regional centers;

– The definition of housing and working zones

– The definition of areas subject to potential restructuring and densification;

– The definition of supra-communal limits of urbanization;

– The betterment transport infrastructure, particularly intermodal links.

In regard to the protection of nature, the plans foresee the creation of an ecological network and the financing of renaturation measures, in addition to the elaboration of a shared water provision and wastewater treatment systems. Further, the depollution of soils located in groundwater perimeters is also anticipated.

No common denominator on communal level

On communal level, each entity has their own spatial planning regulations detailed in communal legislation: these regulations concern mainly prescriptions in regard to zoning, construction – in particular for the core village – and protected areas.

Evaluative elements

Revision of the cantonal structure plan

Evaluative elements allow for assessment of the extent to which the policy objectives have been achieved. In regard to land use planning, federal legislation anticipates in art. 9[11], a revision of the cantonal structure plans every ten years in order to adapt to new circumstances[12].

Dimension of the building zone

Further, art. 15 let. b RPG[13] states that building zones must be dimensioned according to the development needs of the subsequent 15 years, and serviced within this time period, which implies a regular revision of the underlying communal development plans.

Cantonal building zone use coefficient

Since the 2014 spatial planning legislation revision, a cantonal building zone use coefficient estimates the aggregate density of building zones in each canton by dividing all existing building zone surfaces by the number of inhabitants and jobs. Art. 30 of the federal spatial planning ordinance[14] specifies that the cantonal calculation of future building zone needs cannot exceed the Swiss median building zone surfaces per

[10] In 1989, the Canton of Berne launched the priority development areas program, conceived as a set of well-located areas dedicated to intense economic use. Their development was fostered by the canton: primarily through a close collaboration between the directorates involved in the land use planning process (VOL, JGK, BVE) and economic stakeholders. Additionally, this was accomplished through facilitated or accelerated approval procedures for underlying building regulations (AGR, 2014).

[11] RS 700.

[12] To put it more precisely: the first part consists of a diagnostic of the current state of development and land protection. It determines which areas have been urbanised, where infrastructure has been developed, where precious farmland is located and protected, which landscapes, ecological reserves or recreational areas are considered important and which areas are defined as hazardous (6 RPG). The second part defines how the future development of the canton should take place, how activities with spatial impact are coordinated, what means are used for steering development, and at which temporal scale these defined tasks will be performed (8 RPG)

[13] SR 700.

[14] SR 700.1.

inhabitant/job[15]. Further specifications, such as the evolution of demography and jobs, also have to be taken into account for the calculus, but they do not figure in the ordinance and are specified in the action plans (see 2.2.5).

Compliance of building zones with foreseen service

Cantonal legislation further specifies the requirement that building zones comply with foreseen services[16] and the notification to landowners of their contribution to service costs within two years[17].

Instruments of the policy design

Within the political administrative program, the policy instruments listed in tables 2.6, 2.7, 2.8, 2.9 and 2.10 are tools used by authorities to influence the behaviour of target groups (Knoepfel et al., 2011, 156). The table below briefly describes the main instruments available to the Bernese public authorities – instruments available through federal and cantonal laws – to manage the resource soil, implement land use planning and environmental policy, and induce behavioural changes on landowners. For an exhaustive list of the 158 Swiss federal public law restrictions on (land) property, one can refer to Knoepfel and Wey (2006).

[15]The median values are calculated according to three different types of zones – central, mixed and housing zones – and 22 different types of communes. The categorisation of communes displayed in figure 1.4, subsection 1.1.1 is elaborated by the BFS .

[16]Art. 72 and 108 BauG, SR-BE 721.0.

[17]Art. 155 BauG, SR-BE 721.0.

Type	Name	Description	Redistributive capacity	Scale of action
Regulatory	Zoning plan (art. 57 BauG, art. 43 LATC)	Determines the type of use, density and conditions of construction within the perimeter of each zone it delimits.	In practice: low, because it only distributes value and is not coupled with a compensation mechanism.	Communal level. Possible regional zoning plans (BE) and cantonal zoning plans (BE and VD), but used mainly for public buildings and shooting ranges, industrial zones and quarrying, landscape and nature protection, equipment of recreational areas as well as priority development areas.
	Building regulations (art. 69 BauG, art. 86 LATC)	Determine: • Restrictions applicable to different zones (type of (non) use and general size of buildings, noise restrictions); • Restrictions applicable to construction (connection duties, height, type and profile, distances, shape of surrounding area, parking, infrastructure shared between buildings); • Obligations in regard to nature protection; • Communal political-administrative arrangement within the obligations set by superior law; • Communal procedures within the obligations set by superior law.	Low, because it only distributes value and is not coupled with a compensation mechanism.	Communal implementation, within the obligations set by superior law.
	Zone with mandatory planning (art. 73-2 BauG, art. 66 LATC)	Establishes derogations (in matters of density, height, type of building, etc.) to the general building regulations for specific parts of the building zone like city centres, new neighbourhoods, construction on hills.	Localised distribution or withdrawal of value only.	Cantonal definition, implementation by communal executive.
	Local development plan (art. 88 BauG, art. 64 LATC)	Detail plan of a neighbourhood including mainly equipment, number, type and aspect of buildings, detailed use of soil, financial aspects, etc. It can be substituted by architectural competition or single development projects and can, under specific conditions, equal a building permit (93-1-c BauG and 69a LATC).	Localised distribution or withdrawal of value only.	Cantonal definition, implementation by communal executive (and legislative), approbation by cantonal authority.

Table 2.6: Policy design instruments of the resource soil.

Type	Name	Description	Redistributive capacity	Scale of action
	Cropland protection plan (art.1 and 3 RPG)	Federally established quota of agricultural land that fulfills certain standards in terms of climate, soil quality and topography. The cantons are responsible for the cartography and preservation of their respective shares.	Cantonal maintenance of ecological value. In case of development, distribution of economic value in Berne (higher density obligation).	Federal quota, cantonal localisation and definition of requirements for potential use change.
	Environmental impact assessment	Mandatory for development projects that can potentially cause major damage to the environment; the impact assessment (10ff USG) aims to plan protection measures, and estimates the remaining environmental damage. Part of the building permit procedure, it coordinates and integrates environmental policy, both internally and externally (Knoepfel and Nahrath, 2014, 754).	Prevent withdrawal of ecological value.	Cantonal scale.
	Building obligation	Obligation to develop owned building land within a given time period.	Withdrawal of ecological value.	Communal scale, cantonal/regional scale for areas subject to cantonal/regional development plans.
	Surveillance and investigation obligation (art. 32*c*ff USG)	Based on the cadastre of polluted soils established by the cantons, the polluter or, in case they do not or cannot comply with their obligations, the canton, has the obligation to investigate and surveil polluted sites. The polluter bears the underlying costs, and the authority can require a cost cover guarantee.	Preservation of ecological value.	Cantonal scale.
	Remediation obligation	The owner of a contaminated site, a polluted site on which concentration values of one or several toxic elements are above legal limits, has the obligation to investigate, monitor and remediate (art. 20 AltlV). The owner also bears the costs of the necessary measures (art. 32d USG).	Distribution of ecological value.	Federal definition, cantonal implementation.
	Maximum emission (and imission?) values	In environmental legislation, a set of values fixed by law, above which emissions and imissions are prohibited and action must be taken (VBBo[a], AltV[b]). The regulated domains are, for example, noise, soil (*e.g.* agriculture, contaminated sites...), air and water (*e.g.* flow rates of rivers).	Preservation of ecological value.	Cantonal scale.

Table 2.7: Policy design instruments of the resource soil.

[a] SR 814.12.
[b] 814.680.

Type	Name	Description	Redistributive capacity	Scale of action
Voluntary	Self-control of producers	In regard to chemical and dangerous substances, federal law plans a self-control of producers and importers (art. 26 USG) in order to prevent the circulation of substances that endanger humans or the environment when used according to instructions (Knoepfel and Nahrath, 2014, 754).	Prevention of loss of ecological value depending on the good will of the target group.	Federal scale.
Economic and fiscal	Wealth tax (art. 13 StHG, art. 46 and 65 StG, art. 59 LI)	Land property and any kind of wealth whose value exceeds 97,000 francs is taxed up to 1.35‰in the Canton of Berne and up to 3.15‰if it exceeds 50,000 francs in Vaud. Land maintenance cost and debt interest is deducted. The value of reference is the official value set by the administration.	Potentially high, but in today's setting, it mixes the value of land with other values, and the collected gains are not directly linked with a distributive counterpart.	Federal obligation. Cantonal definition and collection.
	Real estate gains tax (art. 12 StHG, art. 126 StG art. 61 LI)	Tax on the revenues generated from the acquisition and subsequent sale of an immovable property. According to federal law (art. 12 StHG), the sum considered for taxation is the difference between the acquisition and sale prices of a plot. Value adding disbursements made by the owner are subtracted from the taxed amount (Langenegger, 2002, 185ff)[a].	Not directly linked with a land value distribution process.	Federal obligation. Cantonal definition and collection, distribution of income between canton and commune.
	Land property income tax (art. 25 StG)	Tax on the revenues generated by land property. Taxed together with regular revenues.	Not directly linked with land value distribution process.	Cantonal scale, distribution of gains between canton and commune.
	Land value tax (art. 258 StG, art. 19 LCo)	Yearly tax on official land value limited by cantonal laws to 1.5‰. It is collected at the end of each year on the official value of the property. Debts are not subtracted from the value of the property[b].	Potentially high, but in today's setting, it taxes a limited amount of value and the collected gains are not directly linked with a distributive counterpart.	Communal scale.

Table 2.8: Policy design instruments of the resource soil.

[a]Federal law also obliges the cantons to tax higher short-term gains (art. 12 StHG). Bernese tax law (art. 126ff StG) foresees a maximum tax rate of 8.1%. This rate is increased during the first five years of ownership by 10% to 70%. The tax product is then divided between canton (70%) and commune (30%). In the canton of Vaud, the tax rate is degressive, starting at 30% for less than one year of ownership unto 7% for 24 years or more of ownership. The years during which the owner resides at their property count double.

[b]It is set every year together with the approval of the communal budget. According to the law, building land is taxed at market value. However, as mentioned in 1.2.2, the overall taxation level is below market value. Furthermore, land in public ownership, as well as land belonging to a farm or contributing substantially to the farmer's or leaseholder's income, is taxed according to its capitalised income value. This taxation policy does not apply if the land is sold (art. 58 StG).

Type	Name	Description	Redistributive capacity	Scale of implementation/authority in charge
	tax on added land value created by zoning (art. 5 RPG, 142 StG)	Tax levying between 20% and up to 60% of the financial advantages conceded to landowners through zoning operations. The sum considered for taxation corresponds to the difference of land value before and after the zoning operation.	Potentially high, depending on the way collected gains are distributed.	Federal obligation. Cantonal regulation and collection[a], communal distribution of gains.
	Impact fee (art. 19 RPG)	Costs of land service such as roads, water, energy and sewer which are passed on to landowners.Bernese legislation foresees a complete cost coverage by landowners for water provision and waste water disposal[b] and a voluntary cost coverage for roads and other public improvements defined in the local development plan (art. 111 BauG). Legislation in Vaud binds the landowner to contribute to equipment costs. The amount of the contribution is fixed by the commune.	Partial redistribution of equipment costs to the beneficiaries.	Federal principle. Cantonal obligation. Communal collection.
	Secondary home tax (Silvaplana)	Tax on land property that is used as a secondary home.	Distributive counterpart to be defined.	Communal scale and collection.
	Land use steering tax (art. 126d nBauG)	Financial incentive for landowners to use their land as foreseen by regulations. Directed against hoarding behaviours.	Distributive counterpart can be defined by the commune.	Cantonal principle. Communal implementation and collection.
	Visitor's tax (art. 3bis LICom, art. 263 StG)	Tax on nights spent by non-resident persons in a commune. For secondary homeowners, a yearly allowance can be fixed.	Redistribution bound to touristic equipment and events benefiting the visitors.	Cantonal principle. Communal implementation and collection.
	Concession (*e.g.* art. 106 Cst)	Use rights attributed by the executive to a concessionary on specific resources (*e.g.* water) through a public law contract. For the delegation of public tasks, it requires a legal basis (Moor, 1992, 120). As opposed to private property, no restrictions apply to the rights conceded: restrictions are specified in the contract, and are thus part of the negotiation (Leimbacher and Perler, 2000, 19)[c].	Depends on what amount of value is captured by contract and how it is distributed.	Depends on the owner, but most frequently the Federation or the cantons, (*e.g.* for water rights).

Table 2.9: Policy design instruments of the resource soil.

[a] Until the revised cantonal act on constructions is implemented, the Canton of Berne has a voluntary communal regulation and collection of the tax.

[b] Art. 31ff of the *Water protection ordinance of the 24 March 1999*, RS-BE 821.1 and art. 11 of the *Water provision act of the 11 November 1996*, RS-BE 752.32.

[c] The withdrawal of a concession is subject to the guarantee of property and principle of good faith (*Vertrauensprinzip*). A change in legislation modifying the substance of the contract (*e.g.* the rent provided to the concession owner) can be a reason for claiming compensation. However, this depends on if and how the principle of legal stability (*Gesetzesbeständigkeit*) is violated.

Type	Name	Description	Redistributive capacity	Scale of action
Land property	State expropriation State pre-emption Easements Land betterment			
Subsidy	Agricultural subsidies	With the new federal agricultural policy of 2014-2017, the transition from product-based to surface-based subventions in agriculture accompanied the introduction of payments for ecological services (Knoepfel and Nahrath, 2014).	Distribution of economic, as well as preservation and distribution of, ecological value.	Federal definition and distribution.
	Housing subsidies (art. 11 WFG and PMG)	Foster the development of financially moderate housing through (interest-free) credit and guarantees of deposits. Bernese legislation limits cantonal obligations to 13 million francs per year.	Distribution of economic value.	Federal and cantonal scale.
	Regional economic promotion (V-Regionalpolitik and art. 6f WFG)	Tax discounts by the Federation for companies in regions where the evolution of population, income and industrial activity are clearly under the national average. Cantonal subventions for companies initiate business and deposits for acquisitions.	Federal and cantonal non-withdrawal and cantonal distribution of economic value.	Federal and cantonal definition and distribution.
	Subsidy for contaminated sites (art. 32e-3-c USG)	The Confederation subventions investigation, monitoring and remediation measures in case the responsible person cannot be found and/or for sites that have been used as landfills for domestic waste.	Preservation and distribution of ecological value.	Federal scale.
Combined instruments	Land improvement syndicate (art. 55 LATC and art. 4 LAF)	Legal obligation to coordinate zoning and land betterment. Once created, the assembly of landowners (the syndicate) decides by majority vote on planning and service, and maintenance costs distribution. It does not substitute the regular approval procedure of plans.	High, as use rights can be spatially transferred.	Subcommunal until today.

Table 2.10: Policy design instruments of the resource soil.

Implementation of the tax on added land value created by zoning in the canton of Berne

Collection method and communal share

Currently, in the Canton of Berne, the collection of the tax on added land value created by zoning is regulated by tax law (art. 142 StG), and operates through the collection of the real estate gains tax: the tax on added land value created by zoning is deducted from what is collected through the real estate gains tax. This means that for the commune, the collection of the tax on added land value created by zoning is not an entirely new income: only the extra amount of money that would not have been collected through the real estate gains tax is new income. 30% of the real estate gains tax income is allocated to the commune, 70% to the canton.

Modification of the calculation method

With the revision of the federal spatial planning act, the cantonal calculation method is slightly modified: the tax on added land value created by zoning is now separated from the real estate gains tax. This increases communal income, because the tax on added land value created by zoning is now collected systematically and because the communes now accumulate gains from the collection of the tax on added land value created by zoning and the real estate tax. Overall gains from the real estate tax are reduced, because the taxable gains are less. This can be explained by the fact that a part of these gains are collected through the tax on added land value created by zoning. Thus, cantonal income from the real estate gains tax is slightly reduced[18]. The end result is overall higher taxation for the landowner.

The tax generally operates through its implementation in communal building regulations, may mention a taxation percentage, and takes effect through a plot-specific contract (*Infrastrukturvertrag*) between commune and landowner before the zoning operation. This contract states that the owner returns a part of the added value created by the zoning operation to the commune.

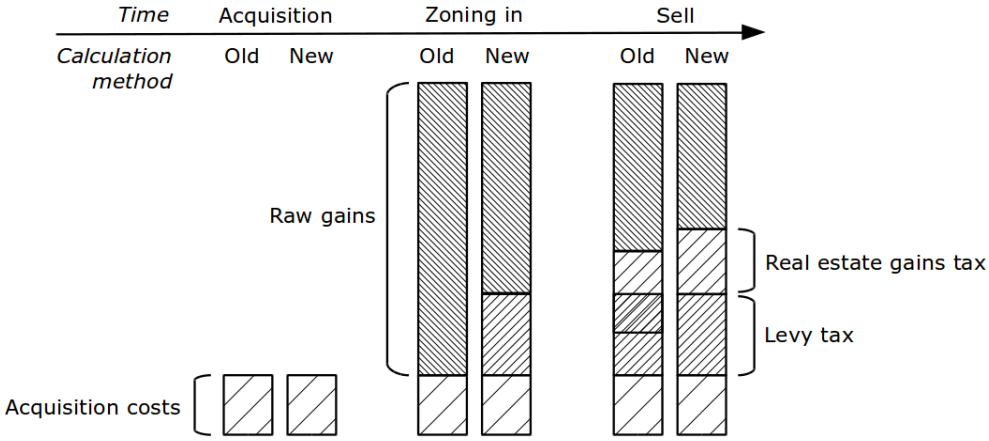


Figure 2.3: Old and new calculation method of the tax on added land value created by zoning in the Canton of Berne. Adapted from FIN (2013). *N.B.*: indicated proportions are for illustrative purposes only.

Weaknesses of current collection method

Reduced tax amount

However, the case studies analysis (3.2.4, 3.3.4, 3.4.4) shows that the current implementation of the tax on added land value created by zoning has a number of weaknesses. First, the taxed amount is negotiated rather freely: for the communes which do not establish a fixed taxation percentage in their building regulations, the amount of collected tax relies entirely on private negotiations between the communal executive and the concerned landowner. For the communes which do have a fixed taxation percentage in their building regulations, the land prices on which the calculation of the tax relies do not necessarily reflect market value, and tend to minimize the amount of money taxed.

Delayed payment

Second, the collection time of the tax depends on the contract's content. Thus, the

[18] A proposition from the cantonal fiscal administration foresees attributing 10% of the gains from the tax on added land value created by zoning to the canton in order to compensate the loss from the real estate gains tax.

tax on added land value created by zoning does not stand for a guarantee that zoned land is effectively developed or sold. Empirical research shows that this incentive is given by an emption right included in the contract (see 3.2.4). This difficulty might persist with the new cantonal construction act, in that article 142b nBauG still foresees a payment due when the plot is developed or sold.

Third, as other costs (such as equipment costs and other fees) also partially rest on the landowner, observed practices show that communes tend to sign one contract consisting of the different costs, fees and taxes, and thus diluting the amount owed (see 3.3.4).

Limited implementation until today

As figure 2.4 shows, the implementation of the communal tax on added land value created by zoning in Oberaargau is partial: out of 47 communes, 18 have a legal disposition in their building regulations mentioning the potential use of the tax on added land value created by zoning when conceding advantages to landowners through zoning operations. For two communes, the building regulations could not be found. As these are small communes, it is probable that their building regulations are similar to the model of regulation proposed by the canton. This model does not regulate the tax on added land value created by zoning. For the communes that have implemented the tax on added land value created by zoning, the date of implementation dates back to the last revision of their building regulations (after 2000).

Use of tax as reaction to zoning implementation deficits

As figure 2.4 shows, there is a tendency for communes with oversized building zones to implement the tax on added land value created by zoning. Communes with highly oversized building zones such as Niederbipp, Thunstetten, Seeberg, Walterswil and Wyssachen have implemented it, and only the small communes of Walliswil bei Niederbipp, Reisiswil and Hermiswil have not. However, because the date of implementation was less than 15 years ago, and the oversized building zones date back to before this period[19], one can assert that the tax on added land value created by zoning has been implemented as a reaction to building zone problems, namely their oversize and/or their availability. In fact, as the cantonal authority blocks new zoning processes[20], the communes must either develop existing ones or relocate them to places where future development is desired. Yet the communal will to extend the existing building zone is not given as such; rather, it is linked to internal politics and the will of certain landowners to locate their plot(s) in the building zone.

Anticipation of or reaction to development?

Further, one can see that the instrument's implementation is at least partly localised: most of the communes from the Bipperamt – from Wangen an der Aare to Niederbipp – have implemented it, as well as the southern communes of Walterwil, Huttwil, Wyssachen and Eriswil. This phenomenon can be linked to different factors, such as the similarity of the problems experienced by geographically close communes. As an example, the Bipperamt, in particular its eastern part, experienced rather strong economic and demographic growth over the last decade. The "development pressure"[21] coming from the east, the favorable housing criteria, and the flat and easily developable agricultural land speak in favor of an anticipation of or reaction to land use change. Further, the intercommunal cooperation through the inter-cantonal regional plan, even if not formalised until recently, supports an enhanced communication or exchange between the authorities of these communes. In the southern communes, the situation is linked to financial constraints, as the fiscal analysis (figures 1.11, 1.12 and 1.13) and the case study 3.3 show.

Diversion of the tax on added land value created by zoning

An additional element worth mentioning, is the absence of a formal implementation of the tax on added land value created by zoning in the two main regional cities, Herzogenbuchsee and Langenthal. The communes' building regulations do not mention this; nevertheless, protocols of the communes' respective authorities mention negotiation with landowners during recent zoning procedures (Commune of Herzogenbuchsee, 2014; Commune of Langenthal, 2013). These communes use it to ensure the payment of land service and infrastructure by the landowners benefiting from the zoning operations. Yet, they proceed without its formal implementation in the building regulations.

[19] As shown in chapter 3, major zoning operations in the three studied communes date back to the 1970s and 1980s. As the cantonal formula for the dimensions of building zones (see 2.2.5) became highly precise in the 2000s, the hypothesis that the oversized building zones existed before the years 2000 is highly probable.

[20] The canton's veto position is confirmed by the case studies analysed in chapter 3.

[21] R. Wyss, heritage and landscape activist, interviewed in Attiswil the 26 March 2014.

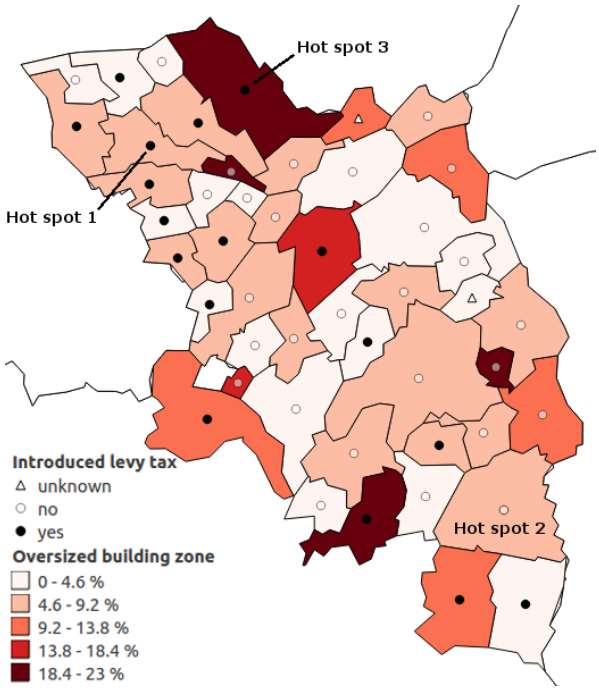


Figure 2.4: Communes with oversized building zones (living and mixed zone) and implementation status of the tax on added land value created by zoning in Oberaargau. Data: Communal building regulations. Map: BFS (2014b).

An underused margin of maneuverability?

If one compares with the situation in other cantons, the example of Wohlenschwil in the Canton of Aargau has shown (Metropolitankonferenz Zürich, 2013, 158) that the communal implementation of the contractual tax on added land value created by zoning does not require a cantonal legal basis. Consequently, the existence of an instrument on the federal level does not require both cantonal and communal implementation in order to be used. If I compare with the tax on secondary homes, the commune of Silvaplana has shown that an instrument does not even require a formal legal basis at all in order to be used. Its contribution to the fulfilment of overarching land use planning objectives is sufficient for validation by the court (Swiss Federal Tribunal, 2014). This brief analysis shows that the potential in terms of regulation and, particularly, the definition of financial incentives is not widely used for the steering of the target group's behaviour. In order to grasp plausible explanations, chapter 3 studies, in detail, the land use planning policy in three case studies.

2.2.3 Procedural elements

Cantonal approval procedure

Cantonal involvement in communal land use planning bound to legal review

Since 1997, the cantonal authority (AGR) has verified the legality – their conformity to superior law – of building regulations and plans, and offered counselling[22]. In case of opposition to the planning documents, the office has proceeded to an opportunity check, where it has verified the purposefulness and suitability of plans, and building regulations in order to achieve the desired land use planning objectives. However, the underlying modifications fall under the responsibility of the commune (JGK, 1997). With this reform, cantonal subvention to communal planning was abolished. As a consequence, the communes have a wider decisional autonomy, because the cantonal control excludes an opportunity check of communal building regulations[23]. Further, the communes also have higher expenses, and are thus more subject to pressure from landowners[24]. In case of non-compliance to superior law, the canton can act as a

[22] Art. 61 al. 1 BauG, SR-BE 721.0 and art. 118 of the Bauverordnung vom 6. März 1985, SR-BE 721.1.

[23] Until 1997, the cantonal authority proceeded to an opportunity check during the preliminary exam of the planning documents. In the past, the cantonal office discussed (with the commune and their planner) the location and density of building zones, whereas today it only checks for legal compatibility.

[24] According to C. Schneider, planning advisor for the commune of Huttwil, interviewed 16.09.2014.

substitute for the commune's authority and execute plan modifications[25].

The current approval or revision procedure for communal building regulations is as follows (AGR, 2014):

1. The commune identifies the need for planning/regulation;
2. It clarifies the project to be realised, based on a pre-inquiry addressed to the cantonal office;
3. It sets planning objectives and contracts a planner to realize the project;
4. It leads the planning process, balancing the parties' interests;
5. The results of analysis (plans, regulations, reports) are opened up for participation;
6. The results are submitted to the canton for a preliminary exam;
7. After negotiation with the Canton, modifications are made by the planner and the commune, and the project is opened up to public opposition;
8. Building regulations are approved by the communal authorities with justification for the inhabitants' oppositions that are not considered;
9. It is submitted to the canton for approval;
10. Opponents whose opposition has been rejected can appeal against the cantonal authority's decision to approve the building regulations.

Communal rights of appeal

Appeal against cantonal structure plan

Communes are allowed to appeal against the cantonal structure plan within a limited time period. Because the canton is given, by federal law, the duty to establish a structure plan (binding for all authorities), the communes have, in case they appeal a decision, to justify how the cantonal structure plan arbitrarily and intolerably neglects their land use planning competency (Kuttler, 1992, 51).

Appeal against plans from other communes

Communes can also appeal against the zoning plan of a neighbour commune by showing that during the approval procedure, the canton did not sufficiently take into account the consequences of the zoning plan in the neighbour commune, infringing in an inadmissible way the appealing commune's planning competency. This shows the limits of communal autonomy which are dictated by the obligation to collaborate and coordinate in matters of land use planning (Kuttler, 1992, 52).

Appeal against decisions of the Directorate

Finallyt, they can appeal the cantonal rejection of their building regulations or other cantonal decisions at the legal office of the JGK directorate[26].

Right of opposition of environmental protection organisations

Based on environmental legislation, environmental protection organisations active for more than ten years at the national level, and pursuing strict ideological objectives, can oppose planning decisions and the delivery of permits for which an environmental impact assessment is mandatory[27]. This right has been used with success for example in order to implement remediation obligations (Dupuis and Knoepfel, 2015).

Individual rights of appeal

Public involvement

The legal procedure states that authorities must allow popular participation in planning matters at an early stage[28]. This can happen, for example, through discussion during the communal assembly and/or through public access to documents during at least 30 days for a local development plan or building regulations[29]. Results from the consultation are public and should be transmitted to the decisional authority.

Cantonal opposition procedure

Oppositions to planning documents must be provided in written form along with

[25] Art. 65 BauG, SR-BE 721.0.
[26] Art. 40 VRPG, SR 700.1 and art. 61a BauG, SR-BE 721.0.
[27] Art. 55 EPA, SR 814.0
[28] Art. 58 BauG, SR-BE 721.0.
[29] Art. 60a and 95 BauG, SR-BE 721.0.

evidence[30]. These appeals can be made by directly affected individuals who have an individual interest deemed worthy of protection. The authorities protecting the public interest are in charge of non-profit legal entities whose statutory aims, during the prior ten years, addressed matters of land use planning or environmental protection[31]. The cantonal authority is in charge of deciding on these oppositions during the approval procedure of planning documents[32]. Individuals and organisations which have provided an opposition in front of the commune, local authorities and regional authorities can oppose the canton's approval decision. This suspends the application of the legal dispositions until the legal office of the JGK directorate rules on the matter[33]. Further appeals are addressed to the cantonal administrative tribunal[34]. Oppositions in regard to land service are to dealt by the prefect[35]; appeal court is the cantonal administrative tribunal[36].

2.2.4 Political administrative arrangement

P. Knoepfel et al. (2011, 159) define the political-administrative arrangement as "the competent authorities and administrative services (public actors) as well as all of the other institutional rules specific to the implementation of a policy. In addition, they provide some of the (categories of) resources necessary for these new activities [and] identify other administrative bodies that will be involved eventually or consulted".

Approval of cantonal structure plans by the federal executive

On the federal level, the arrangement is composed of the federal spatial planning office, which supports and advises each canton in the elaboration and adaptation of the cantonal structure plan[37]. The office also leads the verification procedure and writes the examination report[38]. The plan is approved by the Federal Council at the request of the Federal Department of the Environment, Transport, Energy and Communications DETEC[39].

Cantonal structure plan elaborated by the cantonal executive

The cantonal structure plan is developed by the Justiz-, Gemeinde- und Kirchendirektion JGK[40], which hosts the cantonal planning office, and by the Cantonal Council in the canton of Vaud[41]. Even though not mentioned as such in the laws, technical development is, in both cases, most probably done by the respective cantonal office in charge of land use planning, which is the *Amt für Gemeinden und Raumordnung* (AGR) in the canton of Berne and the *service du développement territorial* (SDT) in the canton of Vaud.

Approval of regional and communal building regulations

The respective Directorate of each canton is responsible for the preliminary exam and the approval of regional and communal structure plans and building regulations.

The cantonal spatial planning office

In the canton of Berne, is the section *Communal and regional planning* of the Cantonal planning Office, in charge of checking the legal conformity of communal building regulations and approving them. The section is composed of urban planners and legal advisers, each group in charge of approximately 40 to 50 communes. As the authority's competence is limited (since 1997) to a legality check of the building regulations[42], its control on the commune's activity is limited to formal aspects: calculation of building zone reserves, use of the correct legal terms in the building regulations and compatibility issues with the cantonal structure plan. It does not take a position on the location of a zone, the type of construction it hosts or the relevance (or lack of) of the content of the building regulations. Further, it is in charge of gathering the positions and potential oppositions of all cantonal offices included by law in the revision process of communal building regulations (*e.g.* Office of economic promotion, waste and water Office, forest Office, agricultural Office, archaeology Office...).

The communal representative

As mentioned in 1.2.4, the commune is the central authority implementing land

[30] Art. 60 BauG, SR-BE 721.0.
[31] Art. 35ff BauG, SR-BE 721.0.
[32] Art. 61 BauG, SR-BE 721.0.
[33] Art. 61a BauG, SR-BE 721.0.
[34] Art. 61b BauG, SR-BE 721.0.
[35] Art. 113 BauG, SR-BE 721.0.
[36] Art. 114-1 BauG, SR-BE 721.0.
[37] Art. 9 RPV, SR 700.1.
[38] Art. 10 RPV, SR 700.1
[39] Art. 11 RPG, SR 700.
[40] Art. 104 BauG, SR-BE 721.0.
[41] Art. 9 LATC, SR-VD 711.
[42] With the exception of cases of formal opposition against revised building regulations or local development plans where the canton may still formulate remarks on the content of the regulation.

use planning policy in the canton of Berne. The communes chosen are of average size, *i.e.* between 2,000 and 5,000 inhabitants. Within the elected communal executive body (*Gemeinderat*), there is at most, the president and one other person in charge of land use planning. Depending on the commune, the communal executive boy is not necessarily the leading force behind the conduct of the policy. The head of administration (*Gemeindeschreiber* or *Gemeindeverwalter*) can also have a key position in conducting land use planning policy, as they have a better knowledge of the commune's spatial planning activities. Administrative staff does not always have planning abilities[43] and essentially deals with construction matters and building permits[44].

The urban planner

The urban planner is contracted by the commune to elaborate and revise its building regulations, which essentially consists of:

- construction prescriptions (*Baureglement*) for each zone (use, density, type of constructions), spacing between buildings, aesthetic aspects (type of roof, appearance...) and other obligations or restrictions;
- a zoning plan where each plot or part of plot is attributed to a zone defined in the building regulations.

The contracted planner counsels the commune on spatial planning matters and often remains associated with it over a longer period of time – those contracted by the communes considered in this research have been working with the commune for more than ten years. Moreover, they have mainly a regional working area, and thus inside knowledge of surrounding communes and the overall problems and constraints they face. They also help the commune to meet legal requirements of the Canton.

The cantonal Directorate

In case of appeal against a decision of the cantonal planning office (*e.g.* decision concerning the rejection of opposition against communal building regulations), the first instance dealing with the matter is the legal Office of the JGK Directorate. It is the direct supervisor of the spatial planning Office.

2.2.5 Action plans

Definition

Action plans consist of all decisions considered as necessary in order to produce coordinated and targeted outputs (Knoepfel et al., 2011). They are characterised by five criteria:

1. explicitness;
2. degree of aperture;
3. discriminativeness;
4. restructuration/reformulation of the political administrative arrangement;
5. distribution of resources.

Cantonal building zone use coefficient

On federal level, the new technical directives on building zones (ARE, 2014) concern housing, mixed and central zones, and require the calculation of a cantonal soil-use coefficient, *i.e.* (the ratio between the sum of communal building zone capacities on one hand and demographic and jobs forecasts on the other hand). This ratio corresponds to a maximum surface use per person, or job[45] calculated for each type of commune according to the BFS classification (Flückiger, 2014); the demographic and jobs forecast can be based on the "high scenario" of the Federal statistical Office. The forecast takes into consideration undeveloped plots as well as partially developed plots.

Calculation of communal housing needs

In the Canton of Berne, the current structure plan sets a calculation method for housing zone needs (A01 KRP). According to cantonal practitioners, the criteria

[43] Some interview requests with the administrative staff were redirected to the political leader, because the staff was not involved in the revision of building regulations.

[44] Niederbipp and Huttwil have the full competency to deliver building permits, whereas Wiedlisbach only deals with small permits.

[45] art. 30a RPV, SR 700.1. This is equivalent to a *minimum* number of persons, or jobs, on a determined surface (Flückiger, 2014, 46). Both the minimum number of person per surface and the maximum surface use per individual are relative values. They are not fix the maximum surface of constructible land is (Flückiger, 2014, 86).

have gradually expanded. The following factors are taken into account in the current calculation method: cantonal population forecast, evolution of home occupancy rate, development bonus for regional or cantonal centres, evolution of average home size in square meters, minimum density coefficient of new housing zone, percentage of housing in regard to other uses (for mixed zones), minimal building zone needs and percentage of population living outside the building zone.

Minimum density requirements

The structure plan demands that the building zone capacity be calculated with a minimum density of 0.3 in rural communes and between 0.4 and 0.7 in more central communes[46].

Connection to public transport

Once the need for a new housing zone is given, its connection to public transport has to be guaranteed[47]. The structure plan foresees that 80% of the newly zoned area has to be connected to public transport, and areas bigger than one hectare have the obligation to fulfill higher connection standards[48]. For housing zones located in a cropland protection area, higher density and public transport connection are required (A06 KRP).

Development of working zones

Concerning the size of working zones, the structure plan does not foresee a specific calculation method. It distinguishes between local and regional zones defined by the communes and cantonal main development areas. Strategic working zones are also defined by the canton (A05 KRP). Zoning of local working zones (< 1 ha) does not have to fulfill specific criteria, whereas zoning operations bigger than one hectare have to be connected to public transport. For the cantonal main development areas, those focused on services (*e.g.* commercial centres) have to fulfil higher standards in terms of public transport connection than those only hosting jobs[49].

Regional action plans based on cantonal structure plan

Regional action plans are derived from the cantonal structure plan (A05 KRP) and deal mainly with the creation (zoning, equipment and connection to public transport, availability of land) of priority development areas, public buildings and shooting ranges, industrial zones and quarries, landscape and nature protection and the equipment of recreational areas. The priority development areas are subject to specific cantonal or regional development plans and their respective development status is updated in regular control reports. These plans contain specific measures in terms of service, connection to infrastructure, transit regulation and air quality. The main objective is the spatial concentration of land uses generating important traffic. The *Gesamtstudie Wangen an der Aare – Oensingen* is part of a development area. As mentioned before (1.2.4), the document has not yet been approved by the concerned communes nor published by authorities.

Communal structure plan

On the communal level,, the communal structure plan[50] determines the future parts of the communal territory that should be developed or subject to zoning changes and consequent land use modifications. Communal authorities use this as a guideline for the subsequent zoning plan revision. Its binding character is not applicable to the target groups.

2.3 Synthesis

The previous sections on property rights and the policy design have exposed the institutional framework which steers land use in the two studied cantons, and in Switzerland as a whole. Within a regime where land is private property, the target group addressed by public regulations are the landowners (2.2.1). The use of their property has to follow the central land use planning policy objective of an economic and appropriate use of soil (2.2.2). To achieve this aim, public authorities have a range of private law and public law instruments which cover wide areas and act as means of intervention. Yet, the brief presentation of these instruments shows that only few links leading to a redistributive process exist between them. Notably, the main instrument aimed at the fulfilment of this task – the tax on added land value created by zoning – does not seem to have been used for this purpose (2.2.2 and 3.2.4).

The regional analysis conducted in this chapter has provided a rough overview of land use planning policy and land use changes in Oberaargau. But a detailed

[46] A density of 0.3 means that for a plot of 1,000m^2, 300 m^2 of gross floor area have to be built.
[47] Art. 74 BauG, SR-BE 721.0.
[48] Minimal connection requirements defined in measure B10 of the cantonal structure plan.
[49] Art. 26 BauV, SR-BE 721.1.
[50] Art. 68 BauG, SR-BE 721.0.

knowledge of the policy instruments' implementation processes and the effects they have on landowners is omitted . Most policy instruments affect the distribution and withdrawal of economic and ecological value, but it has yet to be determined exactly how they do this, and how the concerned actors react to it. These are elements that chapter 3 deals with.

Chapter 3

Case studies

The two previous chapters provided a general regional overview of land use changes in Oberaargau, and detailed the existing policy design and property rights (institutional regime) regarding soil, and focussed, necessarily, on policy instruments. The present chapter focusses on the local (communal) level and on the interactions that take place between political-administrative authorities and the land use planning and land use policies' target group.

Case studies' objectives

The objectives of this chapter are threefold. First, the aim is to show how the creation of added and reduced economic and ecological values occur in empirical land use planning processes and their subsequent impacts on land use value creation processes. Secondly, to understand and explain actors' formal and informal instrument implementation strategies and arrangements in regard to redistribution issues. Thirdly, the results from these analyses are meant to help us qualify the redistributive capacity of the Swiss institutional resource regime of soil between 1990 and 2014. In order to reach these objectives, I analyze three case studies with important and specific redistributive challenges:

1. A building zone transfer in Wiedlisbach in section 3.2;
2. Oversized building zones in Huttwil in section 3.3;
3. The reuse of polluted soil in Niederbipp in section 3.4.

Three peri-urban cases

The three selected cases are located in the peri-urban region of Oberaargau (see figure 3.1). Wiedlisbach (1) and Niederbipp (3) are two communes located at the bottom of the Jura in what is referred to as "Bipperamt." These communes are on the east-west axis of the Swiss Mittelland, and are well-connected to transport infrastructure. Huttwil (2) is located in a hilly landscape, and is more remote than the two other case studies.

3.1 Methodology

3.1.1 Case studies' selection criteria

In accordance with the research group, case studies are defined as narrow perimeters within the case study which demonstrate localized land use and land use planning issues characteristic of the studied region, in addition to effective use of policy instruments. These areas may occupy a single, or several locations, depending on the redistributive issue at stake. The following criteria have been used for selecting the case studies for analysis:

1. Important changes in land use planning;
2. Presence of oversized building zones;
3. Different property rights settings;
4. Major land use changes;
5. Important issues around ecological and economic added/reduced value;

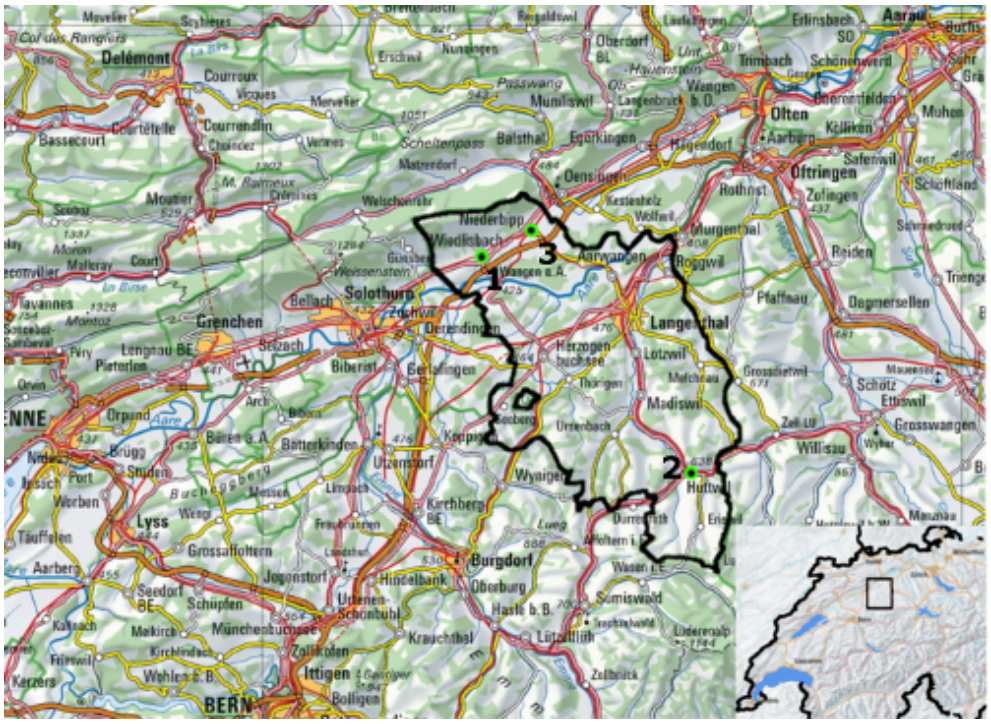


Figure 3.1: Regional overview map highlighting the three selected case studies. Map: Swisstopo (2014a).

6. Presence of conflicts;
7. Evaluation of local redistributive arrangement (use of an instrument).

All three selected case studies face redistributive challenges common to Swiss peri-urban areas: low density development and urban sprawl (Perregaux Dupasquier, 2013), oversized non-serviced building zone (specifically, its removal from the building zone (Kissling, 2014; Jeannerat and Bühlmann, 2008) and the financial risks that accompany the withdrawal of rights), (Bühlmann and Jäger, 2010; Jäger, 2006), and the unavailability of building land (Bühlmann and Perregaux Dupasquier, 2013), and the unadapted choices of location (Griffel, 2006). Some of the challenges faced by these case studies are also common to general Swiss land-use planning issues: the lack of communal funds in order to service building land (Bühlmann, 2007), regional planning matters, such as planning coordination and the imposition of binding measures to the communes (Perregaux Dupasquier, 2013; Inderbitzin, 2003; Bühlmann, 2002), but also the reuse of polluted soils (FOEN, 2015).

3.1.2 Documental research

For each of the case studies selected, the initial step is to review all documents submitted by the commune to the cantonal authority for approval during the last 25-30 years. These documents relate to the preliminary exam, the final approval and the approval ordinance. Among these:

- building regulations (structure plans, construction regulations, zoning plans, landscape and nature protection plans, land service plans);
- (preliminary) reports on past and future communal development;
- reports on new building regulations explaining the changes in context and how the revised regulations are tackling these changes;
- relevant protocols of the communal executive body and communal legislative body;
- oppositions raised by landowners, organizations and other permitted persons; protocols of negotiations (if available);

- cantonal planning office reports, and other offices involved in the approval procedure;
- written and oral correspondence between canton, commune, urban planner and other actors;
- report on public consultation procedure;
- approval documents such as approval decisions or decrees of the cantonal authority, final building regulations;
- potential oppositions and appeals against communal and cantonal decisions.

The analysis of this data gives an overview of the zoning evolution and instrument implementation in the commune as well as the main reasons behind the changes over the time period considered. It also reveals part of the target group's and third parties' preferences and strategies (legal remedies used, type and intensity of conflict, negotiated elements, etc.).

In order to retrace the evolution of construction, I relied on the "travel through time" function that the federal office of topography provides on its website[1]. The maps are elaborated in time intervals of 6 to 10 years at a scale of 1:25,000, which allows us to trace back through the construction of all new individual buildings since the end of the 19thth century.

3.1.3 Interviews

The second step consists in conducting a series of interviews with persons involved directly in the planning process, as well as third parties and other stakeholders. These persons provide complementary information to the administrative documents and offer different viewpoints inside and outside of the political-administrative arrangement. Interviewed persons are principally:

- the planner contracted by the commune for establishing the local development plans and revising the building regulations;
- the political head of the commune and/or the communal administrator in charge of construction matters or general administration of commune;
- the cantonal planner responsible for approving the communal land use planning policy and her/his co-workers (legal officer, planner from the section dedicated to cantonal or regional land use planning);
- other cantonal offices involved, the waste and water office (AWA) in the case of Niederbipp;
- third parties, such as environmental organizations, landscape protection associations and journalists.

3.1.4 Cases' structure

The analysis of the three cases is structured in five sections in order to facilitate comparisons:

1. the first section consists of an analysis of land use planning and land use changes on the communal level;
2. the second section offers a brief review of main contextual factors such as demographic evolution, economic and fiscal factors, and topographic and locational elements;
3. the third section contains an analysis of legal constraints that have influenced communal land use planning, actors' strategies and effective land use;

[1] http://map.geo.admin.ch

4. the fourth section analyses the specific instruments mobilised by actors, the strategies actors have pursued, the means and resources they used and the resulting decisional output;

5. the fifth section examines the impact of the use of instruments on value redistribution.

3.2 Transfer of building zone in Wiedlisbach

Located in the northern part of Oberaargau, called Bipperamt, Wiedlisbach is a small Bernese commune delimited in the north by the Jura mountains, and the Canton of Solothurn, and in the south by the Aare river. As shown by figure 3.2, the mountainous northern part of the communal territory is covered with forest and grazing lands and remains – with the exception of a hospice center and a farm – undeveloped. The central part of the commune consists of agricultural land and settlement. A train line connecting Solothurn to Niederbipp and Langenthal crosses the village. Three small widely-piped brooks converge at the southern limit of the village. From there, the waters flow towards the Moos, a flat land close to the Aare. The Moos is bisected by the N1 motorway and a slip road, (this slip road grants access to Attiswil, Wiedlisbach and Oberbipp in the north and Wangen an der Aare and Herzogenbuchsee in the south). An important part of the Moos is a military zone designated by the Canton as a (future) strategic working zone. The communal territory also includes a widely developed island on the Aare. The south-eastern part of the commune is covered with forest, whereas the western part is primarily dedicated to agriculture.

This case study analysis of Wiedlisbach demonstrates how from the end of the 1970s on, the commune building zones were oversized and badly designed, which contributed to a disorganised process of urbanisation. After a significant period of demographic growth during the 1990s, the commune faced a sudden stagnation since the 2000s. Currently in Wiedlisbach, building zone reserves are fragmented, and land hoarding is a widespread phenomenon, effectively leaving very few plots available for development. Wiedlisbach's main land use planning challenge is to rationalise its building zone through the mobilisation of existing development rights. The commune uses an innovative "green zone" in order to temporarily suspend unused and hoarded development rights, and shows communal creativity in the combined emplyoment of existing land use planning instruments (i.e. building regulations, zoning, emption right and contractual agreements).

3.2.1 Land use planning and land use changes

Conflictual revision process

The last revision of Wiedlisbach's building regulations (in 2013) introduced two main transformations which led to the emergence of conflicts (AGR, 2013b,a): the temporary suspension of development rights for certain landowners and the planned extension of the housing zone in two potential locations. Both elements produced controversy among the inhabitants and 34 oppositions were filed. The opponents feared increased traffic, a obstructed views, and a cost increase born by a tight communal budget(Commune of Wieblisbach, 2013; AGR, 2013a). Dozens of landowners refused to allow (a portion of) their plots allocated to a green zone which would prohibit development. This reaction led, in turn, the communal executive body to reduce the number of plots affected by the temporary suspension of development rights and to withdraw temporarily the two building zone extension projects. However, these were inscribed into the non-binding communal structure plan. The revision process was continued finally approved by the canton in 2013. In 2014, a partial revision was started in order to realise one of the planned building zone extension. It was submitted to popular vote, and accepted by the inhabitants in June 2014.

Diversion of the instrument "zoning"

One of the main reasons for selecting Wiedlisbach as a case study is the diversion of the instrument zoning, transformed to meet the local challenges of unused building zone reserves and land hoarding: a green zone was introduced during the 2013 revision of the building regulations. This green zone temporarily suspended the development right from an undeveloped or parttially plot located in the building zone. Then, the reduced surface of building zone reserve was subtracted from the overall communal building zone reserves, which, according to the cantonal authority, exceeded the upper limit. This allowed to gain a margin of manoeuvre towards the canton in order to create a new building zone in a future revision of building regulations.

In order to understand how the revision of a zoning plan created such a high level of conflict and how the situation was finally resolved, it is necessary to trace the evolution of land use and land use planning policy over the last decades. The following analysis focuses on the core of Wiedlisbach's village and excludes the previously mentioned island and hospice center, as these areas were not affected by the issue of building

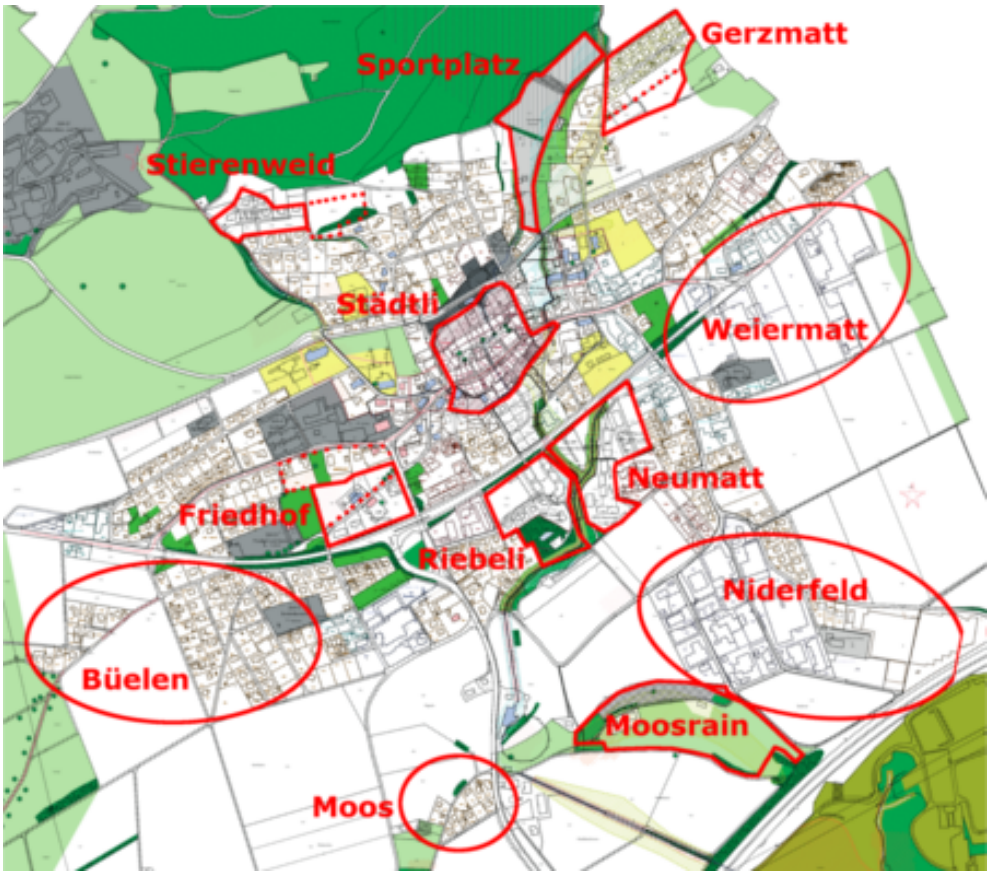


Figure 3.2: Main neighborhoods of Wiedlisbach. Dot lines correspond to former ZPP perimeters.Yellow marked zones are farms; grey zones correspond to zones dedicated to public use and green zones include forests, agricultural protected areas, and groups of trees, vegetation, or land temporarily excluded from the building zone. Map: Commune of Wiedlisbach (2013).

zone transfer.

Figure 3.3 shows the described land use planning evolution from 1978 to 2013, the state of land use before 1979, and its evolution from 1978 to 1987 and 1987 to 2011. The years considered for tracing the evolution of land use were chosen according to the Federal Office of Topography's map actualisations, and as as a way to correlate with zoning plan revisions. The fine dot line on the right side of figure 3.3 shows the communal border between Wiedlisbach and Oberbipp. As one can observe, the two settlements are nearly joined. The following paragraphs refer to the map in order to describe land use planning and land use changes over time.

Major land use planning changes in 1979, and land use changes from 1979 to 1987/1989

A sprawl that dates back to the beginnings of land use planning policy

The oldest available zoning plan dates back to 1979. Compared to established construction, the zoning plan shows wide building zones (**brown** surfaces on the map) with already scattered buildings. In fact, from the 1960s on, the settlement area extended significantly, and had already delineated some of the current limits between developed and undeveloped land. Construction (**dark grey** on the map) is spread along the roads and the railway lines, downhill and southwest from the core of the village and uphill in the Gerzmatt. The working zones of Niderfeld and Einisbüel were created during the development period of the 1960s.

Major land use planning changes in 1989, and land use changes from 1989 to 2013

One zoning out decision

With the zoning plan revision of 1989, three building zone reductions occurred simultaneously (marked **light purple** and numbered "1" on figure 3.3). With the exception

Year	Land use planning changes	Land use changes
1979	Revision of the building regulations and repeal of the provisory protected areas established by emergency federal decree in 1972 (AGR, 1979b)	Partial development of Büelen and Niderfeld
1989	Revision of the building regulations: reductions of building zone (AGR, 1989)	Construction of the bypass road, development of Neumatt and Riebeli, partial development of Büelen
1995	Extension of the southern working zone in Niderfeld	Progressive development of Niderfeld
2002	Partial revision of the building regulations: modification of the map of protected areas, modification of the inventory of protected buildings, delegation of small building permit authorizations to the administrative and buildings commission (mentioned in AGR (2013b)), approval of the local development plan Stierenweid	Development of Stierenweid in the following years, partial development of Büelen
2010	Partial revision of the building regulations: implementation of the hazard map, adaptation of building regulations regarding the old town (mentioned in AGR (2013b)	–
2011	Launch of the revision process of the building regulations and zoning plan. Conflict over the creation of a green zone and theextension of the building zone	–
2013	Approval of the revised building regulations by the canton: creation of the green zone, and temporary suspension of development rights (AGR, 2013b). Refusal by inhabitants and neighbours of two building zone extensions in December 2013.	–
2014	Partial revision of the building regulations and zoning plan: adoption of one building zone extension (Gerzmatt). Approval by cantonal authority blocked by federal moratorium in April of that year.	–

Table 3.1: Main land use planning changes in Wiedlisbach since 1979.

of the zoning outside of the Moosrain (southwards from town in the direction of the motorway), the size of the building zone did not change substantially. According to the scarce available data, [2], the success of law suits and potential compensation were improbable. At the same time, on the western hillside in the upper Moos, in an already partially-developed location, the commune zoned a patch of building zone. However, the owner of two of the plots threatened to file for compensation if his development rights were removed. The cantonal authority considered the communal decision "not inadequate" (AGR, 1989, 4).

One compromise?

Additionally to the Moosrain, the cantonal authority suggested, during their preliminary exam, an additional building zone reduction in Stierenweid, located on the hillside at the northern border of the settlement area. However, the plots located on the west part of the zone (area that is developed today) were already serviced (AGR, 1988), only the eastern land stripe was taken out of the building zone[3].

In addition to the building zone extensions, (marked light brown and numbered "2" on figure 3.3), there are several "filling of gaps" within the existing building zone, a small extension of the sports zone (up north along the forest) and a rather important (approximately 2 ha) extension of the working zone east of Weiermatt.

[2]Archive documents (AGR, VVYY) the original developer wanted to build a giant complex including: two 15 story towers, a dozen houses, several flats and around fifty single-family homes. However, the area was minimally connected to roads, and entirely outside of the settlement area.

[3]As the recently developed area remaining in the building zone required the construction of an access road, the communal decision was to zone only some of the plots. This decision does not appear to have taken into account the eventuality of compensating the landowner for a withdrawal of rights, but rather on a compromise negotiated to prevent opposition during the building zone revision process.

In terms of land use, the main changes up until 2011 (**light grey** on figure 3.3) were: the construction of the village's bypass road, the development of the housing area Neumatt (at the junction of the piped brooks), the development of Büelen (in the south western part of the settlement area), and the development of Stierenweid (on the north-western hillside). All of this housing construction occurred in un-built building zones.

Land use planning changes until 2013

Building zone extensions that match existing land use...

With the last minor revision (1995) and the last major revision (2013) of building regulations, a minor extension of the building zone is observable, (marked **yellow** and numbered "3" on figure 3.3), but initiated in order to match retroactively the zoning plan with pre-existing uses. The extension up north of Wiedlisbach at the limit of the forest was for the sports zone, the extension of Stierenweid (on the hillside) was due to the recently modified local development plan, and the extension at the western settlement boundary extended the small, preexisting working zone. In 1995, another important extension of the building zone occurred in Niderfeld, close to the motorway (to host a garden centre and a swimming pool).

...and reduce building zone reserves

Of particular interest are the **dark purple** surfaces numbered "4" on figure 3.3:

- two of these purple surfaces correspond to effective zoning (and a return to an agricultural zone): the slim purple rectangle under the Gerzmatt (north east) and a smaller purple rectangle from Niderfeld (northwards), the major industrial zone. Both occurred with consent by the owners and were meant to reduce match zoning with effective land use and thus reduce "fictive" building zone reserves;
- another dark purple area in the Neumatt, next to the brooks, is now zoned as a park;
- all other dark purple areas were part of the building zone and not built on; they are now, in accordance with the owners, designated part of the newly created green zone.

One zoning "hole" (numbered "5" on figure 3.3) is present between Weiermatt and the historical town centre: this plot was never put into the building zone and is now part of the green zone.

The free plots (**beige** on the map) include only undeveloped plots (according to the map elaborated by the communal planner and the commune, and submitted during the building regulations revision procedure in 2013). All plots have been serviced and are within the building zone. They do not include the potential for densification on already developed plots.

Gab between zoning and actual land use

The comparison between actual constructions and zoning plans shows that as an instrument, zones which separate constructible area from non-constructible area works: all construction dedicated to housing or working has been built in the building zone. Further, one can infer an overall will to match zoning with effective land use. However, a deeper analysis of the 2013 situation is needed to more fully understand the existing gap between zoning and actual land use.

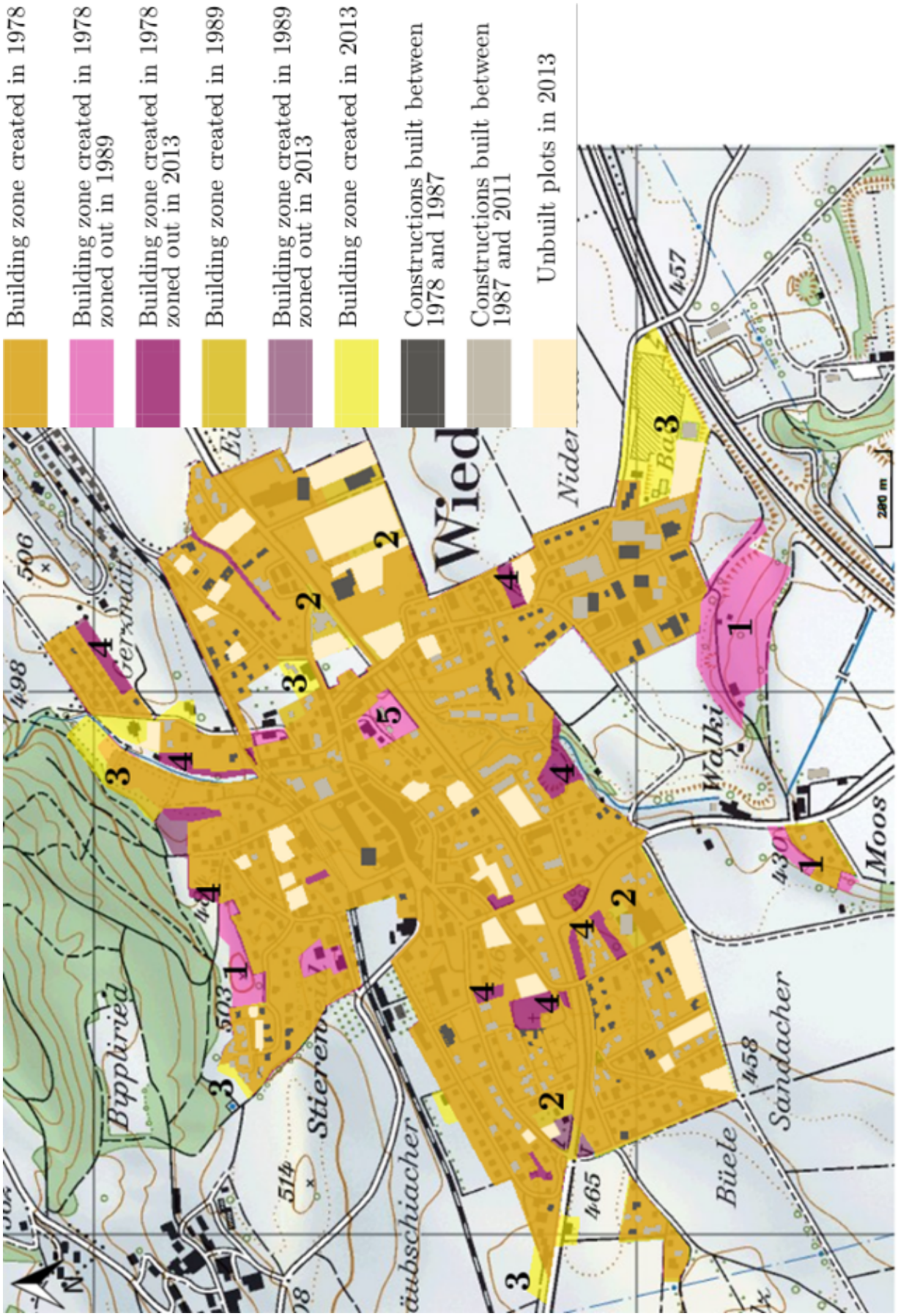


Figure 3.3: Evolution of zoning and construction in Wiedlisbach from 1978 to 2013. Data: AGR (1979b, 1989); Commune of Wiedlisbach (2013). Map: Swisstopo (2014b).

Progressive fill of the building zone

Development that fills the gaps

The cross time comparison shows that development mainly "filled the gaps" between previously established settlement limits: land for housing developed during the last 35 years has remained in the building zone, or in other words, no major residential zoning occurred during this period.

Urban sprawl within the building zone

The spread of construction began before data on zoning is available. However, with the revision of 1978, the new zoning plan drew a large line around existing construction, so that huge, oversized building zones were created, (sometimes even against the landowners will)[4] . During the 1980's and 1990's, only marginal building zone reductions were made, and portions of the zoned plots were built without local regulation exceeding the communal zoning prescriptions. The primary form of construction was the single family home, (with exception of the Neumatt area where several three floors buildings were erected). The working zone of Niderfeld also experienced strong development over the last decades.

Numerous un-built surfaces

The remaining un-built portions of the building zone are strongly fragmented, and spread across the entire building zone. Un-built housing plots accounted for 5.7 hectares of the building zone in 2013[5]. According to cantonal calculations, this corresponds to the upper allowable limit (AGR, 2013a). As the map shows, these plots are scattered across town[6], some of them with unconventional shapes or limited access hindering their full development. However, this concerns only a minority of the plots.

Land scarcity as a main reason for not building

The hoarding phenomenon can be explained by different factors. One landowner, the Burgergemeinde, explicitly states their intentions to save land for future generations. More generally, the organisation conceives land as as a heritage, referred to as *Kulturgut* (Burgergermeinde Wiedlisbach, 2014). These plots are located in the middle of already developed plots, so they cannot be rezoned as agricultural. For the Burgergemeinde, sale of land occurs in very few cases, the preferred disposal being long term leasing through the attribution of building rights. During the information session on new building regulations, inhabitants argued that they save land for future generations; others consider it their personal retirement fund (Berner Zeitung, 2011).

Hoarding behaviour

A 1996 survey of these owners sought to determine whether owners building intentions (Commune of Wiedlisbach, 2011b, 50). A brief look at the un-built plots in 1996 and 2014 shows that the owners who stated their intent to build in 1996, have still not built. Thus, it appears these owners did have the necessity themselves to construct a home.

Urban sprawl within the building zone

In addition to these considerations, one can also find explanations for undeveloped plots within the development process itself: the construction process in the building zone took the form of a small sprawl of construction: time after time, plots are sold and houses are constructed. Land service followed the needs of construction and there was not always a coordination with the land property structure. Consequently, a group of plots where for example land betterment measures would have been necessary in order to optimize land uses are now impossible, as some owners have already built their homes. In certains cases, local development plans have been adopted, but the they lack of coordination with underlying property rights and thus never implemented[7].

Non available building land

Even for constructible plots (where no further land betterment measures are necessary), authorities cannot force the owners to build, and this creates a paradox: building reserves exist within the current building zone, but they cannot be used. In order to circumvent this problem of availability, the only option left to local authorities willing to grow – regardless of their motives[8] – is to zone new land.

[4] R. Grogg, journalist for Berner Zeitung, interviewed in Langenthal 25 March 2014.

[5] If plots of the working zone are taken into account, this totals 9 hectares

[6] Here the **beige** and the **dark purple** surfaces (with the exception of the cases of building zone reduction and the creation of a park) should be considered building zone reserves, as both are un-built and within the building zone.

[7] The case of the Friedhofsweg is a good example,where several successive development plans were adopted, but never put into practice. One should take note of the partial construction of the local development plan Ribeli in the Neumatt (see figure 3.3).

[8] Press articles mention the contested communal growth strategy aiming to attract new rich inhabitants in order to higher tax revenues and better the financial situation of the commune (Berner Zeitung, 2011).

As federal and cantonal legislation prohibit new land zoning as a "strategy", the only solution to the current problem is to transfer unused rights to locations where landowners are willing to build. This leads to the search for the most appropriate instrument to solve the problem. As section 3.2.4 below shows, the solution chosen by Wiedlisbach is quite innovative, but hardly fulfills federal land use planning objetctives. Prior to the in-depth analysis of the used instruments, section 3.2.2 presented contextual factors, and section 3.2.3 presented the legal constraints that have been identified as most relevant.

3.2.2 Contextual factors

In regard to the context, I analyse the case of Wiedlisbach in terms of demographic, economic and topographic aspects.

Demographic evolution

Strong demographic growth in the 1990s

Over the last 22 years (1991 to 2013), the commune's population increased from 1,927 to 2,181 inhabitants, an overall increase of 13.2% or 0.6% annualised (BFS, 2015). Compared to the surrounding communes, this growth falls between that of Oberbipp, Niederbipp and Wolfisberg on the east (between 23 and 28% over the same period or 1.3% annualized), and the slight decline in Attiswil or Farnern in the west (around 3% over the total period). Compared to the regional, cantonal and Swiss average, Wiedlisbach is far above regional and cantonal growth rates (7% and 6.2% respective total growth or 0.34% and 0.28% annual growth) and near the national average of 17.5% (0.8% annual growth).

Demographic stagnation in the 2000s

Over the last 15 years – the time period considered for the revision of the building zone regulations (1997-2012), nominal population growth has equalled 40 inhabitants:1,8% over the whole period for an annual growth rate of 0.12%. These numbers are under the regional (3,46% overall and 0.23% per year), cantonal (5,75% and 0.38%) and national averages (13.28% and 0.89%). From 2001 to 2011, the vacancy rate remained around 2%. Low construction rates during 1995-2005 contributed to a stagnation in growth, a pace which persists, as seen in an almost total absence of housing construction between 2005 and 2011 (Swisstopo, 2014b).

Economic and fiscal evolution

Middle class commune

Compared to other communes of the region, inhabitants of the commune have an above average fiscal capacity[9] (925CH per month compared to an average of 825CHF per month). With almost one job for every two inhabitants, the job supply is also above average (30 jobs for each 100 people regionally). Tax rates for natural persons corresponds to the regional average (1.59) (FIN, VVYYa), and the land tax rate is also slightly above average (1.2 instead of 1.12) (FIN, VVYYb).

Overall decreasing land prices

In terms of land prices, no local data is available for Wiedlisbach. I can only rely on regional numbers which show an overall price decline of serviced building land for single family homes from 300CHF/m^2 in 1999 to 200CHF/m^2 in 2014 (Wüest and Partner, VVYY). If one considers sale prices of single family homes of 5 rooms, a price drop from 605,000CHF in 1994 to 539,000CHF in 2012 is recorded (Wüest and Partner, VVYY). This downturn is put in perspective when compared to other price data (SRED, 2014): based on transaction prices of single family homes between 2003 and 2014, the SRED data shows a slight price increase (from 620,000CHF to 700,000CHF). These moderate or shrinking prices are one factor in explaining the blocked construction of single family houses in the commune (single family homes are the main type of construction on the communal territory). An alternative explanation provided by the *Herdgemeinde* is the landowners' intentions to "keep land for future generations" (Herdgemeinde Huttwil, 2014).

Topographic and spatial characteristics

Well preserved historical centre

Wiedlisbach has been considered a town since 1386 when it was granted the right to host a weekly market as compensation for its services during the war of Sempach

[9] I understand fiscal capacity as the potential

against the House of Habsburg (Commune of Wieldisbach, 2014). Its historical centre is well preserved and its roofs are among the last of the region without any skylights[10].

View on the Alps and good transport connections

As shown in the first chapter of the working paper, the location of Wiedlisbach is attractive in terms of housing: views are desirable, in particular for houses on the hillside of the Jura. The accessibility by public transport is, for a large part of the housing zones, ranked in category C or D by the cantonal structure plan(meaning most inhabitants have a train connection every half an hour to Solothurn, Niederbipp and Langenthal). A dedicated motorway onramp offers connections within less than an hour to Bern, Basel and Zurich.

On a whole, the statistics show Wiedlisbach as a rather attractive location for middle to upper income families looking for private individual housing.

3.2.3 Constraints of superior law

Another central factor contribute to explain the land use planning process resulted in such an oversized and scarcely used building zone: the cantonal constraints and their implementation.

Building zone calculus of the 1989 revision

Concious cantonal approval of oversized building zones

Documents on the 1989 revision of building regulations do not offer any demographic growth calculations[11], mentioning only previous building zone capacity (1,000 inhabitants) (AGR, 1988). Without further precision in the calculation methods, no detailed comparison can be made. The lack of data limits the conclusion to the fact that the effective nominal population growth of 254 persons that took place during the 15 years after the revision fell well short of the building zone's capacity. Even with growing surface needs for individuals and lower occupancy rates of flats, the current building zone remains oversized.

Cantonal building zone calculus in 2013

In the 2013 revision, the following parameters were used in the calculation of the building zone size. They are combined as follows:

- *Current population*: the data used in the revision documents differs slightly from official data (2,227 inhabitants according to the commune, 2,181 inhabitants according to the canton);
- the current population is multiplied with the *cantonal growth factor*: According to the revision documents (Commune of Wiedlisbach, 2011a), the population growth over the last 15 years is 7.6%, which differs from the growth data presented above (3.2.2);
- the prognosticated nominal population growth is divided by the *average flat occupancy rate*: 1.7 for central communes, 2.1 for all the other communes. This shows the *number of flats needed to absorb growth*;
  - because statistically the average flat occupancy rate tends to decline (2.28 persons per flat in the year 2000, 2.2 in 2020), additional housing is needed to maintain current population level. Therefore, the future population per flat ratio is subtracted from the current population per flat r to obtain the *number of flats needed to maintain the current population*;
  - both numbers of flats are then added together;
- the number of total flats is then multiplied with the average gross floor area per flat: 140m^2. This gives the *overall needed gross floor area*;

[10] In 1974, Wiedlisbach was granted the Wakker price by the Swiss heritage society for its exemplary care of the historical center site.

[11] The communal report and calculation elements could not be found in the cantonal archives.

– the overall gross floor area is then divided by the minimum density coefficient[12]: 0.3 for rural communes, maximum 0.7 for central and agglomeration communes. This gives the *surface of land that is needed for housing development.*

Exceeding reserves block any further development process

In Wiedlisbach, the calculus results in housing zone needs of 5.7 ha for the next 15 years. From this area, one has to subtract the existing undeveloped housing zone. Undeveloped surfaces smaller than 500 m^2, plots with complex geometry, banks of trees as well as buildings, are not considered as reserves. In Wiedlisbach, 7.7 ha of the housing zone is currently undeveloped, of which 2.7 more hectares remain undeveloped on partially developed plots. This results in an oversized building zone of approximately two hectares. In this situation, cantonal practice is to match new surfaces to be zoned in by an equal amount of surfaces to be zoned out (AGR, 2013a). The other until now unused possibility is to develop these land reserves.

Priority development areas

No zoning bonus is granted by economic policy

Although located on a cantonal and regional development axis, Wiedlisbach does not enjoy looser development regulations, as only the centre (Niederbipp) of the priority development areas do. Only a vast field between the motorway and the Aare, currently property of the federal army, has been designated by the canton as "strategic working zone". Nevertheless, the development process in this area is under cantonal supervision[13] and does not concern communal zoning or development restrictions.

Cropland protection plan

Cantonal criteria applying to plots that are part of the cropland protection plan require:

– a justification that the location is the best among others (implies a search for alternative locations);

– a connection to public transport;

– an economic use of soil *e.g.* constructions with a minimum density coefficient of 0.4 for rural communes (Kanton Bern, 2011).

Regional planning

A rather flexible landscape protection plan

The regional landscape protection plan defines landscape protection areas (their exact dimensions and location are subject to communal interpretation). These protected areas can also include regional urbanization limits and corridors for animals. The current plan includes several landscape protection zones and urbanization limits, as in the east of the Gerzmatt, precisely where the foreseen extension area of the housing zone is located. Despite the plan, local authorities have a room to manoeuvre in implementing the regional plan (AGR, 2013a): they can adapt the perimeter of the protected area to fit their development aspirations.

No regional compensation possibilities

The regional global transport and settlement plan locates regional housing and working centres, but Wiedlisbach doesn't have any of these. When a commune wants to create a building zone in such a regional centre, they have the possibility to compensate zoning operations on regional level (another commune has to reduce its building zone at the same time), an unused opportunity for now[14].

General considerations regarding constraints of superior law

Cautious cantonal control

The two building regulation revisions analysed lead me to formulate the following remarks: In 1989, the content of cantonal objections concerning zoning and density was – at least in its written form – strictly advisory.Comments employed the construct, "in our opinion," or diverted responsibility for the decision to the commune by relying on its discretionary power in terms of land use planning (AGR, 1988, 5). For

[12]The density coefficient is the ratio between the gross floor area and the total surface of a plot. A minimum density coefficient of 0.3 requires that for a 500 m^2 plot, at least 150 m^2 of the gross floor area are developed

[13]Use of a cantonal development plan as zoning instrument.

[14]See regional governance structure in section subsubsec:regional governance.

example, the prohibition of apartment buildings written in the construction prescriptions (family homes with more than two flats) was criticized but accepted without further comments. Further, a 50% population growth potential in the building zone reserves "blasts any demographic growth prognosis" (AGR, 1988, 2), but does not otherwise hamper the approval process; additional artificial reduction of capacity through the lowering of density, and prohibition of several family homes in certain zones were criticized, but did not block the review process .

No veto from other cantonal offices

During the approval procedure[15], the office of agriculture criticized the size of the building zone, but acknowledged that it is mostly located in already built areas and thus probably serviced. The office of economic development supported the extensions of the working zone and pushes to extended zoning close to the motorway as well as a more "active land use policy" in order to gain control over the effectiveness of regulations (AGR, 1988).

Increased technicality with potential for new loopholes

During the 2013 revision, an extended building zone calculation method was used where (partially) undeveloped plots were individually listed with their respective constructible surfaces. The cantonal authority used the results, along with their demographic prognosis, to approve or reject building zone extensions. Additional criteria, in particular the connection to public transport, is another means (used by both sides) to either justify the acceptability or the irrelevance of a new building zone. However, as the example on building zone transfer in subsection 3.2.4 shows, tighter criteria for defining building zone reserves leads to more precise building zone definitions, which in turn increases the technicity of the legal process, and opens up new potential loopholes.

An involvement with limited effectiveness

The 2013 preliminary exam of building regulations by the canton provides a set of elements that contribute to revealing the nature of power relations that exist between the actors. In the reports of the cantonal offices involved in the procedure, the agricultural office focussed on the future zoning extension in the Gerzmatt, part of the cropland protection plan. The office deplored the "very rudimentary balance of interests" made by the commune, in particular the absence of consideration of agricultural interests and the approximate consideration of federal criteria (AGR, 2013a). The agricultural office appears resigned to accept the loss of agricultural land: they do not set any additional requirement (for example in terms of density) nor oppose the zoning process. The office in charge of economic promotion, part of the same directorate, was, as opposed to the 1989 revision process (AGR, 1988), not involved in the consultation procedure. The nature protection office pushed also towards a more detailed zoning plan including all types of natural elements worthy of protection such as hedges, shore groves, individual trees and groups of trees.

3.2.4 Local use of instruments

Legal and contractual building obligation

Communal implementation of contractual building obligation

In order to overcome the problem of land hoarding, during the 2013 revision of its building regulations, the commune introduced the notion that the development of undeveloped plots in the building zone were of public interest[16]. After a period of fifteen years, landowners do not have the right for their plots to remain in the building zone. Using new legal basis, the commune negotiated with landowners who do not want to develop their plots. In certain cases, a contractual building obligation arose between the commune and landowners: several owners promised to build their land within the next ten years. However, the implementation of such a rule has been contractual; its signature by the two parties relied on the landowner's will to cooperate, or accept to be put in the green zone. Some owners, resistant to both solutions, asked for a building permit in order to keep their plot in the building zone and gain some time, although they did not intend to build[17].

Enforcement of building obligation for previously zoned plots

According to communal and cantonal authorities, the building obligation had until the implementation of the revised federal law limited validity in a court, but this is now very likely to change: according to art. 15*a* of the federal spatial planning act, cantonal legislation must, in case of public interest, find a way to ensure that

[15] Only the offices taking position on building zone issues were mentioned.
[16] Art. 3 al. 2 of the *Building regulations of 30 July 2013 of the commune of Wiedlisbach*.
[17] R. Grogg, journalist for Berner Zeitung, interviewed in Langenthal 25 March 2014.

a plot is constructed within a defined period of time. In the future, the commune could rely on the signed contracts in order to force development. But in case the landowner fights the communal decision, the commune would need to prove that the plot's development is of public interest. Despite its communal recognition, is is not certain to be recognised as such by a court for single plots in Wiedlisbach.

Building obligation for plots to be zoned

This tricky situation only applies to plots already in the building zone. With plots remaining in the agricultural or protected zone, the commune has the possibility to use an emption right. An example of the exercise of this emption right would be commune acquisition of land at a predetermined price if it is not developed within a given time span. In the case of the Gerzmatt perimeter, adopted by the commune as a new building zone, the commune has negotiated this change of status with the landowner[18].

Transfer of building zone

"On the border of legality"

The main instrument studied in the commune of Wiedlisbach is zoning. The commune uses the instrument in an innovative way that aims towards the spatial transfer of development rights. The cantonal authority qualifies this strategy as "on the border of legality"[19]. The strategy behind the building zone transfer is to reduce the building zone in the inner village on (partially) undeveloped plots and use the "development credits" gained through this reduction in order to zone an area outside of town.

Step 1: Temporary suspension of development rights

Operation of the building zone transfer occurred in two steps. The first step was to conduct individual negotiations with all landowners who owned undeveloped or partially developed plots considered building zone reserves by the canton. The aim of these negotiations was to obtain landowner consent to remove (a portion of) their unused plot from the building zone[20]. The owners who agreed to the communal proposal were placed in what was referred to as a "green space and garden zone"[21]. According to the building regulations, this zone aimed to "ensure the existence of green spaces, gardens and orchards within the settlement area"[22]. The zone change was comprised of three main components, all mentioned in art. 54 of the communal building regulations:

1. a removal of their development rights for a minimal period of 8 to 10 years, or until the next building regulations revision process;

2. a priority right to be zoned when the commune begins subsequent revisions of its building regulations;

3. an exemption from the tax on added land value created by zoning when the plot is put back in the building zone.

The underlying objective of this green zone was to reduce the amount of communal building zone reserves [23]. As mentioned in section 3.2.3, the size of the building zone reserves do not allow for further zoning procedures.

An instrument lowering density temporarily

In terms of usage, the green zone allows for underground construction, whereas surface construction can only occur if linked to the care and use of a garden or orchard. The new zone does not affect the use rights of third parties: for example, public access is not granted to these areas. It merely ensures that very limited development will take place . In fact, the green zone can be considered a de facto regulation for the lowering of density. In the future, when the zoning plan will be revised, (at least eight

[18] M. Allemann, president of the commune of Wiedlisbach, interviewed in Wiedlisbach 24 June 2014; D. Ott, architect and planner, member of the executive committee of Badner Partner AG, interviewed in Solothurn 1 April 2014.

[19] A. Schnyder, head of communal and regional planning, S. Bleuel, head of main development centres, R. Siegenthaler, urban planner, *Amt für Gemeinden und Raumordnung, Justiz-, Gemeinde- und Kirchendirektion* of the canton of Berne, interviewed in Berne 24 April 2014.

[20] One alternative mentioned in the previous paragraph was to make them sign a contractual building obligation.

[21] Art. 54 of the *Baureglement der Gemeinde Wiedlisbach vom 30 Juli 2013.*

[22] *Ibid.*

[23] D. Ott, urban planner, co-director of Baderpartner, interviewed in Solothurn the 1st April 2014.

to ten years after a zone change), owners of plots in the green zone willing to build (or to sell) will have rezoning priority over landowners outside the building zone.

Trivial consequences for long term hoarders?

The potential consequences for landowners of plots in the green zone should be addressed. For those whose plot has been placed entirely within the green zone and have no intention to build or to sell in the medium term, there are almost no consequences. Subsequent revisions arise every 10 to 15 years, and owners can ask to be zoned back in and, after modification of the zoning plan, development rights are restored. In case of communal refusal, owners can oppose the decision during the revision process and have the possibility of seeking compensation for material expropriation. However, as this phenomenon has not yet been observed it seems likely that the landowner will have to prove their intentions to build prior to rezoning.

Temporary development rights reduction traded against additional development rights

For the owners of plots located partially within the green zone, their zone change involved (in most cases) a reduction of the unused development rights. However, the reduction depended on which part of the plot had been put into the green zone. In certain cases, the green zone was located where no construction was permissible (*e.g.* if accessibility from one side did not meet necessary requirements, or if a forest or river bordered the plot). Thus, the use right restriction equaled zero. However, certain owners were effectively restricted in their rights. Among these owners, some negotiated with the commune for looser building regulations regarding the timeframe for when their plot could be rezoned[24]. Thus authority cedes their legal resources for the landowner consent on and support to the zoning plan revision. The result is change in the communal building regulations and zoning plan and contracts signed with the green zone landowners that negotiated specific in kind compensation.

Diversion of the zoning instrument

For the communal authorities, the green zone permits influence over the amount of building zone counted as reserve. According to current cantonal practice (AGR, 2013a), the number of square meters taken from the building zone and designated as green zone can then be used to zone in new land somewhere else. Along with this ability to transfer land, another subtlety has been exploited by the commune: undeveloped plots or part of plots smaller than 500 m^2 are not counted as building zone reserve. Thus, any reserve bigger than 500 m^2 that can be reduced through green zoning to less than 500 m^2 no longer counts as a reserve, which allows for further reductions of excessive communal building zones (see section 3.2.3). This technique was applied to several owners' backyards: one owner had, for example, a 700m^2 of building zone reserve in his backyard that counted as 700m^2building zone reserve for the commune. The commune put 250m^2 of the backyard's reserve in the green zone. This left the owner with a building zone reserve of 450m^2, but reduced the commune's building zone reserve to 0m^2.

Step 2: Transfer of building credits

Conflictual transfer at the settlement border

In Wiedlisbach, the building zone surface gained through the green zone was then transferred to the perimeter Gerzmatt on the northeastern communal border. In fact, prior to the transfer, a smaller part of the perimeter was already defined as building zone. But because its shape did not suit proper development (and was not serviced yet), the communal executive body and the landowner negotiated the definition of a new, broader perimeter. As the parties could not agree on a compromise prior to the end of the building regulations revision (ended July 2013), the extension of the building zone was postponed (AGR, 2013a).

In December 2013, after having signed an agreement with the landowners, the communal executive body proposed to zone two perimeters: Gerzmatt and Moselen. But the public inquiry proved too contentious[25]. In the end, the subject was withdrawn from the communal legislative body's agenda.

In June 2014, the communal executive body made a second legislative attempt, and submitted just the zoning of Gerzmatt for adoption. The communal assembly

[24] As the analysis of oppositions of individual landowners to the zone change and the transcriptions of negotiations with the commune have shown (AGR, 2013b), simple persuasion is not always enough to gain owner approval. Compensation in the form of higher density or a reduction of the perimeter of the green zone has been conceded by the communal authority.

[25] Criticisms were made regarding the additional traffic that the new construction would generate, and on the potential obstruction of neighbours' views (Commune of Wieblisbach, 2013; Berner Zeitung, 2014).

approved the modification – 38 persons in favour, 20 against (Commune of Wieblisbach, 2014). One opposition against the cantonal authority's decision to approve the zoning was made, and is currently being examined by the cantonal supervisory authority.

Federal moratorium suspends approval

In the meantime, with the entry into force of the revised spatial planning law, a federal moratorium on uncompensated zoning decisions has entered into force[26]. This moratorium is valid until the cantonal act is revised and the cantonal structure plan approved by the federal government. Thus, the approval of the zoning operation in Gerzmatt might be delayed, as federal law requires that any extension of the building zone must be compensated by an equivalent amount of surface rezoned as agricultural. In the case of Wiedlisbach, the recognition of the transfer as proper compensation has been called into question.

Costs reduction through urban expansion

One might ask why the commune wanted to put new land in the building zone. The official response was that the commune intended to overcome the general land hoarding phenomenon and make land available for development. If one looks at the numerous negotiations conducted with the landowners during the 2013 revision of building regulations, (as well as those begun already in the 1990s), this official argument certainly provides part of the explanation. But then why does the commune want to make land available for new development? This question can in turn be addressed with a complementary hypothesis: the commune hopes to raise revenues and lower infrastructure costs per inhabitant through the zoning of land for development. The subsequent arrival of new inhabitants will further lower these infrastructure costs (Commune of Wieblisbach, 2014). As the discussions prior to the adoption of the zoning plan show, Wiedlisbach has had financial issues for several years. According to the regional press (Berner Zeitung, 2011), Wiedlisbach is not the only commune in the region to pursue such a strategy. Its fiscal effectiveness has still to be proven, as new inhabitants also require additional services such as kindergartens, schools and sports facilities.

Implementation of the tax on added land value created by zoning

No fixed taxation percentage

Since the 2013 revision of building regulations, the tax on added land value created by zoning has been part of the communal "tool box". The regulations state that the communal executive body is obligated to negotiate restitution with the landowners, seeking an "adequate amount" of the added value created through zoning[27]. As recommended by the commune's urban planner[28], the legal dispositions do not foresee a fixed tax level. Thus, the local authority keeps a wider margin of negotiation in the amount of the added economic value it captures.

Tax on added land value and land service in one single contract

The above mentioned transfer of development rights in Gerzmatt was the first occasion to apply the instrument. The commune signed an agreement with the landowners (the so called *Infrastrukturvertrag*) including the amount of tax on added land value created by zoning and detail land service costs to be paid by the owner. As foreseen by law (109 BauG), the portion (infrastructure: i.e. roads and pipes) of the land that has been serviced becomes ownership of the commune once realised. In order to ensure the development of the new area, a purchase right was also included in the contract: the commune has an emption right on the land for ten years at a fixed price. However, the commune's ability to buy the land if the owner does not meet their obligations after the fifteen year period remains an open question.

Commune has an important discretionary power

The applied tax rate was 20 % (Commune of Wieblisbach, 2014). It would have been necessary to access the contract in order to see if the land values used for taxation correspond to market price values and to determine the proportion of land service costs that has been passed on the landowner. The study of other contracts between communal land authorities and landowners has shown that even with a fixed tax rate, the effectively taxed amount is still variable and tends to be in the landowner's interest (see section 3.4.4). As a matter of fact, the fixation of land price before and after the zoning operation lies entirely in the discretionary power of the communal authority and their negotiation partners. Further, as land service costs, and the tax on added value created by zoning (in case the instruments are implemented) are

[26] Art. 38*a* of *Federal spatial planning act of the 22 June 1979*, SR 700.
[27] Art. 69 of the *Building regulations of 30 July 2013 of the commune of Wiedlisbach.*
[28] D. Ott, *op. cit.*

negotiated together, the amount of taxes levied is used to pay for land service that directly benefits the landowner (see also section 3.3.4).

Diversion of the tax on added land value created by zoning

The wide margin of manoeuvre granted to communes in the implementation of both the land service tax and the tax on added land value created by zoning allowed a diversion of the instrument from the purpose that it was conceived for, that is the payment of compensations due in cases where a material expropriation took place. The Bernese cantonal construction act defined two distinct instruments, but left a wide margin of implementation to local authorities that frequently favoured a lump sum taxation and simultaneously recovered the costs of land service (Metropolitankonferenz Zürich, 2013).

Mortgage as payment guarantee for infrastructure

Long standing non serviced working zone

The eastern part of Wiedlisbach called Weiermatt is a rather important working zone (2 hectares) that remains un-serviced and un-built. While the first portion was zoned in 1979, and a second in 1989, the owner did not service the land in that lapse of time.

Commune takes over to unblock situation...

After negotiation with the landowner and approval of the land service plan of the working zone by the communal legislative body in June 2010, it was agreed that the commune would finance the land service and be reimbursed no later than ten years, or in the event of a sale of the land. Currently, further proceedings are temporarily blocked by opposition (Commune of Wieblisbach, 2013, 2014).

...and ensures reimbursement through mortgage

The signed contract between commune and landowner foresees that the public authority will, with public money, service the whole area in one go. This will occur after having recorded in the land registry that the amount of money paid for land service is due as a first rank mortgage or, at the latest, ten years after the land has been serviced.

A win-win situation for both the commune and the landowner

This financing method has advantages for all the involved parties. For the landowner, it is convenient because there is no need to take care of land service. There is also a strong incentive to sell the land, as in the medium term, a large amount of money is due. Companies are the ultimate beneficiaries of this policy, because they can move in more quickly and easily; further, they look for already serviced land[29]. The commune finances the project through the leverage that the mortgage they impose on the concerned plots provides. They also have a guarantee that they will recover the investment, because the mortgage contract expires in case of sale, development or at the latest after ten 10 years. Further, the commune can decide upon the schedule of land service.

Revocation of local development plans

The interviewed mayor[30] mentions that during the 2013 building regulations revision, several local development plans were abolished: the development they planned involved a betterment of land that could not be done any more, because some of the plots they regulated had been developed in the meantime. As a consequence, the local development plans lost most of their relevance.

Low rent as critical factor?

In other cases, the abolishment of local development plans aimed to reduce the restrictions to development, *i.e.* on the type or aesthetics of constructions, garden trees and hedges, specific measures for cars, bikes or pedestrians, etc., because they were perceived as impeding construction. Officials and planners mention several times the inadequacy of the types of building considered in the local development plans with current housing demand[31]. From the landowners' viewpoint, the low construction activity can also be explained by an insufficient added economic value that the sale of land would grant . As shown in the next case study, solutions to the economic value issue can be an increase of the land use coefficient in order to gain a higher return – this has to be in accordance with aesthetic considerations and is subject to approval by local inhabitants (section 3.3.4), or a reduction of the expected economic return (section 3.3.4).

[29] M. Allemann, *op. cit.*

[30] M. Allemann, *op. cit.*

[31] M. Allemann, op. cit.; M. Jampen, head of the communal administration, and H.-J. Muralt, mayor of Huttwil, both interviewed in Huttwil the 13 August 2014; R. Suter, head of planning in Niederbipp, interviewed in Niederbipp 8 July 2014.

3.2.5 Impact on value redistribution

Value redistribution leads to urban expansion

The case of Wiedlisbach has shown a value redistribution process that goes against the constitutional land use planning principle of an economic use of soil. The transformation of undeveloped plots in the village centre into unbuildable green zones, allows the commune to reduce two hectares of surface counted by cantonal authorities as undeveloped building zone. The withdrawn surfaces are either entire plots, parts of plots, or remaining reserves. Remaining reserves are reduced to surfaces smaller than 500m^2, which allows complete subtraction from the building zone calculus. As a counterpart to this reduction, additional development rights are negotiated by specific landowners, including additional constructible surfaces or garages. This micro-zoning approach leads to a (temporary) crystallization of "construction holes" within the building zone.

Reduction of ecological value in the middle run

In 2014, the commune has gained through the subtraction of unused building zones a margin of manoeuvre towards the canton. Afterwards, it launches a new zoning process of approximately one hectare outside of the current settlement limits where it reuses part of the “economised” building zone. Such an operation results in small scale urban sprawl. The ecological value of non built plots in the village centre (some of which are orchards) preserved through the green zone is compensated by the development of agricultural land outside of town.

A rather favourable market after all?

As seen in section 3.2.2, market conditions have been more favourable for the construction and sale of individual houses: there has been a significant price drop for single family homes over the last 20 years. But this value change does not stop the village's expansion process, as the landowners concerned by the new zoning process pressure the commune to be included in the building zone (many are even willing to sign an emption right on the zoned land). This fact limits the explanation provided by the supposedly unfavourable housing market.

Creation of medium-term economic value

The economic outcome of the building zone transfer creates two distinct economic effects:

1. a partial and *a priori* temporary reduction of value on the plots in the green zone. It is partial, because for some landowners zoning does not modify their construction potential (no effective reduction of the plot ratio), others have negotiated a compensation in kind (an effective extension of the plot ratio) that will apply when their plot will return to the building zone. The value reduction is temporary, because if the landowners of the green zone want to build in the future, they can ask the commune to be put back into the building zone when the next revision of building regulations occurs (approximately every ten years).

2. an increase of economic value in the new building zone of the Gerzmatt: (1 hectare * 260CHF/m^2)–20%[32]= 2,000,000 francs[33]. Therefore, an overall added economic value takes place.

Reduction of medium-term ecological value

In terms of ecological value, the building zone extension creates a net loss of 1 hectare of fertile land protected by the cropland protection plan. The effects of the green zone are considered equal to zero, because the green zone only maintains the existing ecological value of the orchards. In the middle time frame, part of the plots in the green zone will be developed and the ecological value of these plots will decrase.

Extensive use of resources

The case has shown an extensive exchange of resources between the involved actors (law, consensus, political support): through the negotiations conducted with the landowners and the instruments created in the 2013 building regulations, a consensus was achieved on a temporary suspension of development rights. However, the political support of the inhabitants was obtained only after a reduction of the commune's zoning ambitions. Nonetheless, the commune managed to pass on all land service costs linked with the extension of its building zone to the landowner and capture part of the added value they had created.

Combination of public and private law instruments

In order to achieve its building zone extension strategy, the commune combined the use of public and private law instruments: they traded new legal obligations created by the green zone against additional development rights and several “guarantees”

[32]Tax on added land value created by zoning applied according to M. Allemann. *op. cit.*

[33]Land price estimation based on Wüest and Partner (2014); a plot ratio of 0.4 and an initial land value of 8CHF/m^2 are hypothesised; land service costs and benefits are not considered.

(an exemption from the tax on added value, priority zoning rights). The commune proposed an innovative solution: a voluntary development obligation to landowners reluctant to be included in the green zone. Further, the commune used the added value created by the building zone extension to ensure payment by the landowner of (1) the land service and of (2) the tax on added value created by zoning. The commune also secured the area's development through the signature of an (3) emption right.

3.3 Reduction of oversized building zones in Huttwil

Located in the southern Oberaargau, Huttwil is, along with Herzogenbuchsee and Niederbipp, one of the three regional centres. It is located in the upper Langete valley, 15 km southwards of Langenthal and at the western border of the Canton of Lucerne. The communal territory is marked by a river bed, along which the settlement area is developed, but also by various smaller valleys and other tributary rivers. The hills around Huttwil do not exceed 750 meters, and are mostly dedicated to agricultural use. The train line that crosses town connects the commune with Langenthal in the north, and Lucerne in the east. The canton's main road connects to Burgdorf in the west and Sursee in the east.

Over the past twenty years, Huttwil has experienced moderate urban growth and maintained a high ratio between employment and inhabitants despite a small demographic decline. The limited regional attraction of Huttwil makes it hard for the commune to compete with more central locations as well as to retain inhabitants. Observed through the lens of land use planning policy, the commune deals with a lack of available building zones, a need to reduce oversized building zones, and the difficulty to pass on development costs to landowners. In fact, for a long time, land service was entirely paid for through public funds. Landowners expect a higher rent from their land than what the land market offers[34], so they block development in existing building zones. However, one semi-public landowner shows that despite unfavourable market conditions, the acceptance of reduced rent contributes to communal objectives of fighting demographic decline (Commune of Huttwil, 2009b, 7).

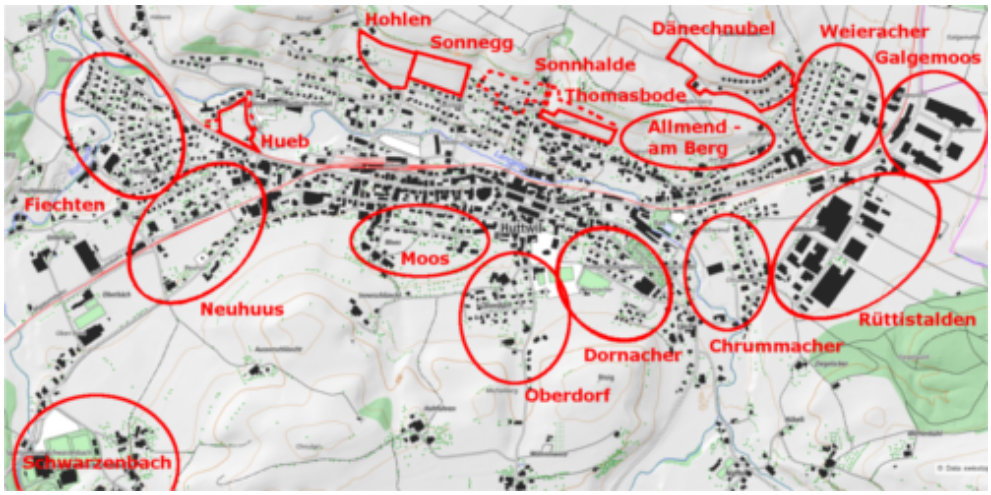


Figure 3.4: Overview map of Huttwil and its neighbourhoods. Map: Swisstopo (2014a).

3.3.1 Evolution of land use planning and land use

Zoning changes in 1977 and their effects from 1977 to 1994

A farmer's desire to get their plots zoned out...

The oldest available zoning plan dates back to 1977, and shows a series of slight modifications made until 1981. The approval procedure was subject to major negotiations between landowners, the commune and the cantonal planning office (AGR, 1977), because important land surfaces at the limits of the urbanized area were zoned out

[34] C. Schneider, architect and urban planner, Schneider Partner, interviewed in Burgdorf 16 September 2014; M. Jampen and H.-J. Muralt, *op. cit.*

[35] The first trace of a local development actually dates back to 1961 (AGR, 1977), when a common development plan was established for Sonnhalde and Thomasbode (AGR, 1985, 1998b, 2011b).

[36] Decision of the 18.09.1997 (AGR, 1997)

[37] Revision dates collected from overview table established by the cantonal planning office. The only accessible decision was the Decision of the 10.12.2012 (AGR, 2011a), which foresees the development of the still undeveloped upper part of the zone.

[38] Decision of the 07.08.1998 (AGR, 1998b).

[39] Revision dates collected from overview table established by the cantonal planning office. Only accessible decision was the Decision of the 18.09.1997 (AGR, 1997).

When	Land use planning changes	Land use changes
1977	Approval of the revised building regulations and repeal of the provisory protected areas established by the emergency federal decree in 1972. Revision of the local development plan of Thomasbode[35]	Part of Dänechnubel already developed
1979	Adaptation of zoning plan in Chrummacher and Rüttistalden (AGR, 1979a)	Partial development of Chrummacher and Rüttistalden in the following years
1985	Approval of the revision of the local development plan Thomasbode	–
1994	Approval of the revised communal building regulations (AGR, 1994a)	–
1995	Extension of the local development plan Dälechnubel;	Development of Dälechnubel in the following years
1997	Approval of revised local development plan for Sonnegg[36]; approval of revised local development plan for Sonnhalde east (AGR, 1997); revision of the the local development plan for Dälechnubel[37]	Development of Sonnhalde east in the following years
1998	Revision of the local development plans of Sonnegg[38] , Revision of the local development plan for Dälechnubel; revision of the local development plan for Thomasbode	–
2000	Revision of the local development plan of Dälechnubel.	Progressive development of Dälechnubel
2001	Approval of local development plan for Sonnhalde west	–
2002	Revision of the local development plan for Sonnhalde west[39].	Development of Sonnhalde west
2011	Approval of the revised building regulations; following adaptation of local development plans of Thomasbode, Sonnegg and Hohlen	–
2014	Revision of the local development plan of Sonnegg[a]	–

Table 3.2: Main land use planning and land use changes in Huttwil since 1977.

[a]The revision has yet to be approved according to the interview of communal representative M. Jampen, *op. cit.*

(not shown on the map). This reduction of building zone happened at the request of a single landowner who cultivated his land, had no intention to develop it, and therefore asked the commune to pu this plots out of the building zone. The commune, under pressure from the canton as well as the Confederation (due to the enactment of the emergency federal decree in 1972), negotiated a 15 year building prohibition easement on the plots of several landowners in the building zone.

. . . used as argument to zone other owners out

According to the cantonal planning office, the use of building prohibition easements is limited by the cantonal legislator for the fulfillment of planning purposes. Its use should remain temporary and exceptional. The cantonal office judged the communal implementation of the instrument for a 15 year period inadequate and asserted that a zone change to agricultural zone is more opportune. They removed several plots at the border of the settlement area from the building zo based on the following two arguments (AGR, 1977):

1. land in the building zone should be used within the next 10 to 15 years;
2. one of the concerned farmers refuses to keep his plots in the building zone; for reasons of equal treatment between landowners, other plots in a a similar situation also have to change zone.

As a counterpart to this decision, the canton cancelled all reserved zones established by the federal emergency decree. For the landowners, this meant a removal of use restrictions on the concerned plots and for the commune, it meant regaining its planning autonomy.

Important housing and industrial development

Despite these important zoning operations, huge building zone reserves still exist

(numbered "1" on figure 3.5). These reserves date back to a time of tight interrelatedness between communal and landowners' interests[40]. These reserves allowed several developments between 1975 and 1994: one can notice the construction of the industrial zone that occurred in Rüttistalden. Further, entire housing neighbourhoods were erected in Weieracher, Lochmüli, Neuhuus, Dornacher and between Rüttistalden and Chrummacher. Most construction was single family homes, except in Weieracher (east) where single family homes and three storey apartment buildings are interspersed.

Development of building zones depends on landowner

Not all building zones are developed, and a gap between zoning and effective land use persists. This hoarding is seen in the case of four wide housing zones, designated at the end of the 1970s, and undeveloped at the time of data collection in 2014 (numbered "2" on figure 3.5): Sonnegg, Hohlen and Thomasbode in the centre north; the fourth area is the Hueb in the centre west of the commune. But this hoarding is not a general phenomenon: in the area of Weieracher in the east, where the land is owned by the Herdgemeinde, a semi-public owner, one can observe only a single undeveloped plot remains – the wider free plots in Weieracher are part of the working zone.

Building regulations revision of 1994 and land use changes from 1994 to 2011

Availability already a central issue...

The 1994 revision aimed to coordinate landscape, development and transport infrastructure by "simple land use planning means" such as building regulations and zoning plans (Commune of Huttwil, 1992, 20). As mentioned in the objectives regarding to land development, the availability of undeveloped building zone is a central issue, as well as the parsimonious use of land (Commune of Huttwil, 1992, 21). Similar to the other case studies, the revision is also conditioned by the new cantonal construction and land use planning law, in particular the mandatory participatory mechanisms[41]. Willingness to increase densification was also central, as the occupation coefficients have been elevated in each zone, and the minimal distances between buildings have been reduced. The introduction of the ZPP in the new building regulations and the creation of seven zones alike indicate a shift towards enhanced coherence and aesthetics, and reduced land consumption of new housing zones.

...that remains untackled

The Huttwilberg (ZPP Holen, Sonnegg and Thomasbode – numbered "2" on figure 3.5) and the area of Dälechnubel (numbered "3" on figure 3.5) were considered the most promising locations for future housing, as the land has a low agricultural value due to its steepness, and immissions (i.e. street noise) are low (Commune of Huttwil, 1992). However, the determining factors remained the willingness of landowners to develop their land. Although this fact was acknowledged as a central issue in the revision documents, no remedy was proposed or suggested (Commune of Huttwil, 1992; AGR, 1994a). Nevertheless, the 1994 revision brought the following changes:

No extension of the housing zone

- firstly, the land located in the Allmend/am Berg is unzoned (numbered "4" on figure 3.5 – light purple). This zone change is similar to the other important unzoning processes of 1977 where the land was still used for agriculture[42];
- secondly, the zoning plan is defined more in detail: protected areas and certain danger areas along the Langete river are now recorded into the map, and specific areas less fit for development have been placed within a green zone;
- thirdly, other modifications around the industrial zone were made (numbered "5" on figure 3.5): the southwest part belonging to the housing zone was unzoned because it was considered too exposed to noise. Further, important extensions of the industrial zone were made on land owned by the Herdgemeinde, one of the town's statutory corporations.
- fourthly, a wide area in the south west is zoned in as institutional zone for a school and a sports centre (numbered "6" on figure 3.5);

The Herdgemeinde as the only active landowner

In matters of construction, when compared to the period 1974–1994, a clear re-

[40] C. Schneider, *op. cit.*; M. Jampen and H.-J. Muralt, *op. cit.*
[41] Art. 58 BauG, SR-BE 721.0.
[42] However, no information could be found in regard to the underlying negotiations.

duction in building activity is observable: only two new neighbourhoods were erected: Sonnhalde and the first part of Dälechnubel (respectively numbered "7" and "3" on figure 3.5). All plots are owned by the Herdgemeinde. Three plots currently remain undeveloped and, at the time of writing, available on the housing market. Further, several non built plots scattered across the urbanized areas were developed, but there are still important differences between zoning and land use:

- the extensions of the industrial zone remain undeveloped until 2014 (**beige** squares)
- the three zones on the Huttwilberg and the one of Hueb remain not built (numbered "2" on figure 3.5).

Building regulations revision of 2011

Limited changes in terms of zoning

During the 2011 revision of the building regulations, several small changes occurred: The first was the extension of the industrial zone in Galgemoos (**light yellow** on the map). The second change concerned two zoning out procedures (numbered "8" and in **dark purple** on figure 3.5): the first zoning out concerned the plot north of the Langete, that has become part of the institutional zone. The adjacent construction up north is the town's hospital. Therefore, no compensation was due. The second was the a plot in Neuhuus, but no further information could be obtained on this matter.

Local policy change passing on land service costs to landowners

The third change concerns the local development plans of Thomasbode, Hohlen and Sonnegg (numbered "2" on figure 3.5). The underlying development plans and prescriptions for these zones have been revised because communal regulations now anticipate passing all land service costs on to landowners. Additionally, the ground's steepness makes land service difficult. Communal authorities raised the density coefficient of these three zones in order to compensate for the additional costs for landowners and the reduced constructible surface of Thomasbode. This case is analysed in section 3.3.4.

Tax for advantages conceded through zoning

The commune is granted the possibility to ask landowners that benefit, via zoning, from increased land value to contribute to land service costs[43]. The adopted solution grants a wide margin of negotiation, as it does not fix a minimal amount, and practically returns the taxed amount to the landowner in the form of land service and improvements. The creation of added economic value is contractually redistributed to the landowner.

Voluntary obligation to build

In order to foster land availability, planning documents refer to the possibility of signing agreements with landowners in anticipation of an emption right if the landowner does not develop their plot within a certain timeframe (Commune of Huttwil, 2007, 21ff).

[43] Art. 27-4 of the *Building regulations of 8 December 2010 of the commune of Huttwil*.

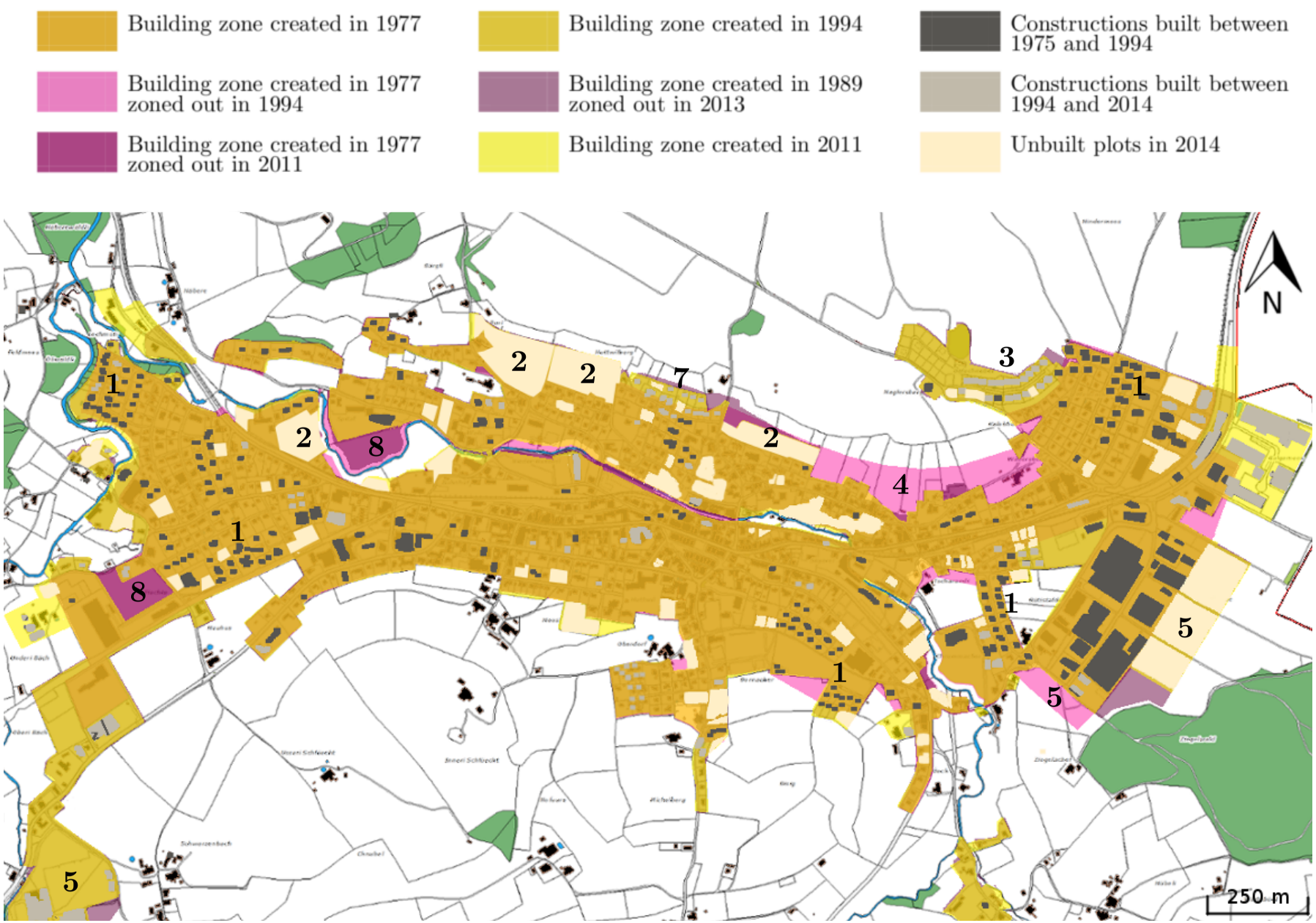


Figure 3.5: Evolution of land use and land use planning in Huttwil from 1977 to 2014. Data: AGR (1979a, 1985, 2011b). Map: OSTAG Ingenieure AG (2014); Swisstopo (2014b).

3.3.2 Contextual factors

Demographic evolution

Slightly shrinking population

The case of Huttwil is of particular interest to the research, because it is a commune whose demography is in decline, yet whose settlement area continues to grow. Over the last 21 years (1992-2013), Huttwil's population has shrunk by 55 inhabitants, (from 4757 to 4702), a reduction of 1,2% (BFS, 2015). Compared to the neighbour communes, Huttwil shows stronger resistance to population emigration than Wyssachen, Eriswil, Rohrbachgraben or Gondiswil (these communes lost, on average, 10% of their population).

Change goes against regional and cantonal tendencies

Compared to regional, cantonal and Swiss averages, Huttwil is far below regional, cantonal, and national growth rates (7%, 6.2% and 17.5% total growth or 0.34%, 0.28% and 0.8% annual growth, respectively).

Over the preceding 15 years considered for the revision of the building regulations (1991-2006), nominal population decline of 108 inhabitants, corresponds to -2,2%. Over the whole period, this represented an annual decline rate of -0.15%. These numbers are under regional (3,46% overall and 0.23% per year), cantonal (5,75% and 0.38%), and national growth averages (13.28% and 0.89%).

In terms of housing, the communal vacancy rate between 2001 and 2011 increased slightly, but remained rather low at 2.3% in 2011 (BFS and Kanton Bern, 2015). This low occupancy rate contrasts with the demographic decline, and may be explained through the progressive vacancy of existing homes, as well as a lower occupancy rate of new homes. As shown for the case of Wiedlisbach (see section 3.2.3 and section 3.3.3 below), the cantonal building zone calculus takes into account the increase of gross floor area used per inhabitant over time.

Economic and fiscal evolution

High concentration of jobs

Compared to other communes of the region, inhabitants of the commune have fiscal capacity above regional average (910CHF per month compared to an average of 825CHF per month). With approximately one job per two inhabitants, the job supply is also far above average (30 jobs per 100 persons regionally). Huttwil hosts the electric bike producer Biketec, which accounts for 125 jobs.

Tax level above regional average

Tax rates for natural persons is slightly above the regional average (1.65 in Huttwil and 1.59 on average), like the rates of the other communes in southern Oberaargau (FIN, VVYYa). Land tax rates are also slightly above regional average (1.2 instead of 1.12) (FIN, VVYYb). Despite the fact that Huttwil has lowered both the revenue tax (from 1.89 to 1.65) and the land tax (from 1.5 to 1.2) over the last decade, the commune's rates remain above regional average, which points to a lower competitiveness[44].

Relatively low land prices

In regard to the evolution of land prices, only a region wide analysis can be made. Interviewees have confirmed the relatively low land prices estimated by Wuest and Partner (VVYY): between 180 and 300CHF/m^2 for serviced land intended for single family homes. If I refer to other price data (SRED, 2014) that uses transaction prices of single family homes, (between 2004 and 2013), there is a slight price increase from 620,000CHF to 700,000CHF.

Topographic and spatial characteristics

A rather hilly landscape

Located in a hilly landscape, Huttwil's shape is profoundly marked by the Langete valley in which it is located. The Huttwilberg marks the northern border of the settlement area with a altitude difference of 100 meters between the river and the plateau uphill. The slope on the southern side of town is less steep, and grants access to two hills of similar height as the Huttwilberg.

Longer commuting distances than in northern Oberaargau

In terms of access, Huttwil is crossed by a regional train line that connects to Langenthal (20 minutes ride) every half an hour and to Lucerne (1 hour ride) almost every half an hour. Thus, the center of Huttwil is classified as "C" in the cantonal public transport access categories. In terms of individual transport, distance to the closest motorway entry is about 30 km, which, compared to the other regional centres

[44] M. Jampen and H.-J. Muralt, *op. cit.*

of Oberaargau, is far. Driving to Berne takes approximately an hour, Lucerne 50 minutes and Solothurn 40 minutes.

3.3.3 Constraints of superior law

Cantonal building zone calculus

Optimistic growth objective

The revision documents of 1994 (AGR, 1994b) mentions a growth objective of 0.75% per year, which corresponds to 36 additional inhabitants. This objective is based on the population difference between 1960 and 1970, the difference being extrapolated for the estimate (Commune of Huttwil, 1992). The 1980s were a decade of stagnation for the commune, with the years 1988, and 1989, constituting an exception (2% growth both years).

Same building zone needs as 20 years ago...

The building zone calculus of 2011 and 1994 are similar. Nonetheless, two elements change: the population growth estimate now relies on a canton wide estimate which unifies the regional demographic disparities. Secondly, there is now a zoning bonus granted to regional centres (such as Huttwil) designated as "strategic growth factor" if they are willing to raise the minimum plot ratio of their building zones.

In 1994, the building zone needs were estimated between 11.7 and 12.8 ha with a population growth of 11.25% over 15 years, which corresponds to a yearly growth of 0.75% (Commune of Huttwil, 1992, 26). Calculated with today's formula (4% population growth over 15 years, centrality bonus and higher gross floor surface per inhabitant), the size of the needed building zone is approximately 11 ha, a surface very similar to the results provided by the old calculation formula (11.7 ha). In other words, if Huttwil were a rural commune, and had no higher density requirements, and no centrality bonus[45], it would be allowed almost as the same surface of new building zone than 20 years ago. Consequently, the evolution of the calculation method has only had a marginal impact on the Huttwil's building zone quota, (between 0.7 to 1.8 ha less building zone is now allowed) despite an actually shrinking population.

...despite a shrinking population

In 2011, the building zone needs were still around 11 ha, despite a population level corresponding to the one of 1988 (Commune of Huttwil, 2006; BFS, 2015) and moderate construction activity (light grey surfaces on figure 3.5). The land that has been developed between 1994 and 2004 corresponds to approximately one third of existing building zone reserves (Commune of Huttwil, 2007, 12)[46].

Position of the cantonal offices

Limited intervention in communal policy

Similar to the first Case study analysed, cantonal offices involved in the building regulations procedure rarely question the relevance of communal policy. As an example, the agricultural office remarks that some building zone extensions (working zone in Rüttistalde and cantonal sports centre in Schwarzenbach) occur on protected cropland. Further, the office of economic development's main purpose is to service plots in the building zone and lower building restrictions in the working zone in order to foster its development. The cantonal planning office notices that the commune's growth prognosis is optimistic and that the calculations in regard to building zone capacity "are characterized by important imprecisions" (AGR, 1994b, 5f), but does not interfere in the definition of the zoning perimeter.

In the 2011 revision, the other cantonal offices involved in the revision procedure did not comment on building zone capacities or calculation (AGR, 2011b).

[45] According to the cantonal structure plan (measure C02), the regions define so called regional centres of fourth level. These centres have the task of attracting employers, be multifunctional suppliers (in terms of public services for the surrounding communes), and become central traffic junctions (Region Oberaargau and Kanton Bern, 2012, 5). These responsibilities usually lead to them being granted a "wider margin of manoeuvre while determining the size and location of zones" (Kanton Bern, 2011, measure C 02) which is then implemented in the form of a strategic development factor part of the building zone needs calculus.

[46] The planning report of 1992 estimates 18,6 ha of housing zone reserves (Commune of Huttwil, 1992, 50). According to the 2007 planning report (Commune of Huttwil, 2007), 5.5 ha have been built since then.

3.3.4 Local use of instruments

Non implementation of the tax on added land value created by zoning as land service tax

Conflict between growth objectives and rent capture

In the initial works linked to the revision of the building regulations of 2006, the main problem for communal authorities is the availability of building land (Commune of Huttwil, 2006, 14). As interviewees[47] and planning documents mention, communal priority is to foster development, growth and construction (Commune of Huttwil, 2007, 21).

Interviewees argue that the introduction of a tax on added land value created by zoning would have been a threat to these objectives, because it would have placed additional financial constraints on the landowners (who are already resistant to land service costs) [48]. This difficulty is due to the fact that until the 2000s, land service costs were fully paid by tax money. However, the worsening of communal finances led to a change of practice: newly approved local development plans have been accompanied by a contractual agreement (*Infrastrukturvertrag*) that passed on part of the land service costs to the landowners. Further since the revision of building regulations in 2011, article 27 al. 4 states that the communal executive body can require financial participation in land service from landowners who benefit from planning measures. The commune uses added value created through zoning in order to pay for land service that landowners benefit from.

This formal transfer of costs required the elaboration of new local development plans for all remaining undeveloped perimeters. As the costs division between commune and landowners are transcribed into a contract that both parties have to sign, some of the landowners simply refused to approve them if they judged the conditions of the new agreement not favourable enough[49].

Change of plot ratio to ensure the pass on of service costs

As the case of Thomasbode shows (see section 3.3.4 below), it is only through the adoption of a higher plot ratio that certain landowners agreed to carry a major part of the land service costs. But in order to lower the land service costs to be carried, commune and landowner have agreed in two recently signed contracts that part of the roads foreseen in the local development plans would remain in private property. This allowed for the application of lower and thus cheaper construction norms than if they were to be transferred to the public domain after development[50].

Land hoarding and the case of Thomasbode

A central challenge for the commune was and is to deal with the availability of land in the building zone (Commune of Huttwil, 1992, 11). The area of Thomasbode illustrates the problem at stake. The areas of Sonnegg and Hohlen further west are characterized by the same hoarding issue: land kept in the building zone for decades and their owners making little effort to improve or develop it.

No will to pay for land service

Located on the southern hillside of the Huttwilberg, at the northern border of the settlement area, the area of Thomasbode was zoned in the 1970s. Since then, at least two local development plans were approved, one in 1985 and one in 1998 (AGR, 1985, 1998a)[51]. The plan from 1998 was linked to a land service contract signed between the commune and the landowners. The contract stated that the commune would finance the major part of the land service. However, the landowners did not engage in any planning measure until 2006, where one of the three owners launched a planning procedure and formally asked the commune to fulfill its obligations and service the land.

Transfer of plots into medium danger zone

The land's development was subject to two major difficulties. First, nine water catchments (to which private and public use rights are attached) were located within the designated perimeter, and the construction of the connecting road might have destroyed several of them(Kellerhals and Haefeli AG, 2010). Second, upon implementation of the communal hazard map in 2009, the entire zone was defined as a medium hazard area (level 2 out of 3) where construction is fundamentally allowed,

[47] M. Jampen and H.-J. Muralt, *op. cit.*
[48] M. Jampen and H.-J. Muralt, *op. cit.*
[49] C. Schneider, *op. cit.*
[50] C. Schneider, *op. cit.*
[51] It could not be confirmed that no previous plan existed.

but subject to protection measures ensuring the safety of humans, animals, and major valuables (art. 6 BauG). Therefore, the area of Thomasbode could not be developed solely based on the local development plan from 1998.

Potential zoning out

As the revision of the communal building regulations went on, uncertainty on how to deal with Thomasbode persisted: the canton stood in favour of taking the area out of the building zone, arguing that no compensation would be due because of the hazard zone in which it was located. The local planning revision committee disagreed: despite the legal restrictions imposed by the danger zone or the difficulty to service the land, the commune had an obligation to compensate landowners for their rights(Commune of Huttwil, 2011). The communal executive body, initially in favour of removing the area from the building zone (Commune of Huttwil, 2009a), was stuck in between the local planning committee and the cantonal authority's opposed positions.

Establishment of a reserved zone

In order not to delay the ongoing building regulations revision process, the communal executive body decided, in 2009, to transform the building zone into a reserved zone[52]. This zone change allowed to suspend planning and land service activities in the concerned perimeter for a minimum of two years. This delay granted the commune the necessary time to mandate a constructibility study that would confirm or infirm the technical feasibility of developing the area of Thomasbode (Commune of Huttwil, 2011, 2). When the report was handed to the comune in 2010, the constructibility of the perimeter was confirmed and the zoning out option vanished.

Third local development plan

In 2011, the reserve zone was replaced by a smaller building zone with modified proportions adapted to the new future construction – conceived as so called *Terrassenhäuser*. This new zone facilitates development, and guarantees a similar level of return on investment, even with a new contract between commune and landowner where the latter bears all land service costs[53]. The plot ratio has been raised in order to compensate the surface loss, and transfer the costs of land service fully to the landowner. What I observe here is the use of the commune's legal authority to compensate for the economic reduced value carried by the landowners and the commune's executive body aversion for fights with elected representatives and landowners, an attitude that is can be observed frequently in the canton of Berne when it comes to building zone reductions[54].

The underlying third local development plan is currently being elaborated, and uncertainty about the actual development of Thomasbode remains. Indeed, no building obligation applies and the commune has no legal remedy to force the owner to build.

Building rights

An important part of the commmune's territory in semi-public hands

The case of the *Herdgemeinde* is an example showing landowners' rent expectation as a factor of land development. The *Herdgemeinde* is a major landowner of the commune and one of Huttwil's two *Burgergemeinde*[55]. The Herdgemeinde has ownership titles on the entire eastern part of the city, namely the entire industrial zone, the neighbourhoods of Weieracher and Dälechnubel, and on most of the fields and forests located north of town (for a total of approximately 300 hectares, of which 38 hectares are part of the building zone) (Herdgemeinde Huttwil, 2014).

Cheap building land available

The land policy of the Herdgemeinde is to keep formal property rights on land and to issue 60 year building rights on plots (Herdgemeinde Huttwil, 2014). This is true for agricultural land as well as building zones. In terms of housing, current rent price for single family homes and apartment buildings is around 3.25CHF/m^2 per year, adapted every five years to the Swiss consumer price index. The building right holder can sell and transmit their rights to a third person. At the end of the contract, if not renewed, the landowner buys the construction erected by the right holder at approximately 80% of the average of capitalized income value[56] and real value considered jointly. For

[52] A reserved zone is a non constructible zone used for a limited period of time in order to ensure the fulfillment of planning objectives. See also art. 62 BauG, SR-BE 721.0.

[53] According to M. Jampen, *op. cit.*

[54] S. Ghioldi, lawyer, communal and regional planning, *Amt für Gemeinden und Raumordnung*, interviewed in Berne 27 July 2014.

[55] Basically a commune without territory

[56] Capitalized income value is the potential return in the form of rent that can be obtained from the buildings; real value corresponds to the value of buildings over time, in addition to their improvements

industrial land, rent price is 3.15CHF/m^2 per year, adapted every five years up to 80% of the Swiss consumer price index. The contract is signed for a renewable period of 60 years. If zoning plans have changed or new construction is anticipated, building destruction costs are subtracted from the purchase price of the house, (effectively carried by the building right holder/home owner).

Limited price fluctuations

However, the risk of a price drop, in case the house is sold, is carried by the landowner and not the building right holder, because the building right holder only sells the produced part (the house and the land service) based essentially on effective construction costs and not on land prices[57]. Table 3.3 shows the differences between the acquisition of a building right and of a formal property title:

	Building right	**Formal property right**
Land property tax	Paid by the Herdgemeinde	Paid by land/home owner
Land service	Paid by building right holder/home owner	Included in total price if plot is serviced
Land	No transfer of property title	Property title included in price
Construction	Paid by building right holder/home owner	Paid by land/home owner
Duration of ownership	60 years renewable	Unlimited
Disposal	Transferable and inheritable	Transferable and inheritable
Property transfer tax	1.8%	1.8%
Rental costs/benefits for 10 years landownership (based on a 500 m^2 plot in Huttwil from 2004 to 2014 without construction and land service prices)	**-16,300CHF**, thus an annual rent of 1.625%[a]	Based on regional land prices (Wüest and Partner, VVYY): **-44,200CHF** [b] Based on constant land prices: **-9,200CHF** [c] Based on lake Geneva prices: **+516,8000CHF** [d]

Table 3.3: Legal and economic comparison of the cost of land based on building rights and formal property rights in the case of Huttwil from 2004 to 2014. Data: Commune of Huttwil (2014); Wüest and Partner (VVYY). Own calculations. Calculations do not consider building deprecation.

[a] Based on a land price of 195CHF/m^2. This corresponds to the accumulated rent over the 60 years of the building right. It also corresponds to current land price estimates by Wüest and Partner (VVYY).

[b] **95,000CHF** (sell price 2014: 190CHF/m^2*500=95,000CHF) **minus 130,000CHF** (acquisition price 2004: 260CHF/m^2*500=130,000CHF) **minus 1,600CHF** (land property tax: 130,000CHF*1.2‰*10 years=1,600CHF) **minus 1,700CHF** (property transfer tax: 95,000CHF*1.8%=1,700CHF) **equals -38,300CHF**

[c] **130,000CHF** (acquisition price 2004: 260CHF/m^2*500=130,000CHF) **minus 130,000CHF** (sell price 2014: 260CHF/m^2*500=130,000CHF) **minus 1,600CHF** (land property tax: 130,000CHF*1.2‰*10 years=1,600CHF) **minus 2,300CHF** (property transfer tax: 130,000CHF*1.8%=2,300CHF) **equals -3,900CHF**.

[d] **825,000CHF** (sell price 2014: 1,650CHF/m^2*500=825,000CHF) **minus 275,000CHF** (acquisition price 2004: 550CHF/m^2*500=275,000CHF) **minus 3,300CHF** (land property tax: 275,000CHF*1.2‰*10=9,300CHF) **minus 14,900CHF** (property transfer tax: 825,000CHF*1.8%=14,900CHF) **equals 516,800CHF**.

Building rights as an opportunity for middle class families?

Taking into consideration the lowering of land prices over the past ten (or twenty) years in Oberaargau, the building rights model is economically more profitable than the full property rights model. However, as soon as land prices stabilise, the full property rights model is slightly more profitable. In comparison with the evolution of land prices from around Lake Geneva, the instrument provides a good counterexample of how the instrument building can neutralise rent. With the building right price of 3.25CHF/m^2, the *Herdgemeinde* offers cheaper housing possibilities for middle class

(Federal Chancellery, 2014).

[57] In a central highly asked location, building right prices will also grow according to the demand, but this growth will be more limited than in a full property model, because the building right ends in the medium/long term, but not the property title.

income families that can afford a 500,000 francs loan in order to build their house but not a 630,000 francs loan. Further, the building right model is also financially more stable and predictable, because it is unaffected or marginally affected by land price variations. In the full property model, land prices can turn a household's investment into a financial black hole or a winning lottery ticket.

Small price increase favours the capital intensive model

But perhaps more relevant are the different housing costs of various housing models as shown in table 3.4: for a ten year period, without considering capital requirements for contracting a loan, the building rights model as it is structured in Huttwil is the cheapest solution. As soon as land prices slightly increase – the 1% price growth chosen here is purely hypothetical, the full property model becomes economically less costly. In comparison to the property models, the rental model is among the costliest way of housing, but the only one that people with low savings can afford; renting is the most prevalent form of housing in Switzerland (BFS, 2016b).

Housing model	10 years housing costs
Full property (Oberaargau prices)	158,300CHF [a]
Full property (1%/year price increase)	59,200CHF [b]
Building right	94,500CHF [c]
Rental housing	130,000CHF [d]

Table 3.4: Comparison of housing costs in rental, building right and full property models over the 10 years between 2004 and 2014 in Huttwil. Data: Commune of Huttwil (2014); Wüest and Partner (VVYY); BFS (2016a,c). Own calculations. Calculations do not consider building e.

[a] **630,000CHF** (acquisition price) **minus 105,000CHF** (mortgage interests based on a 420,000CHF mortgage (2/3 of 630,000CHF – 1/3 owner's capital, 2/3 mortgage), which is composed of the price of land (130,000CHF) and of the house with land service (500,000CHF), at an average interest rate of 2.5%) **minus 10,700CHF** (property transfer tax 1.8%) **minus 7,600CHF** (land property tax 1.2‰) **plus 595,000CHF** (sell price) **equals -158,300CHF**.

[b] **630,000CHF** (acquisition price of land (130,000CHF) and of the house with land service (500,000CHF)) **minus 105,000CHF** (mortgage interests based on a 420,000CHF mortgage (2/3 of 630,000CHF – 1/3 owner's capital, 2/3 mortgage) at an average interest rate of 2.5%) **minus 12,500CHF** (property transfer tax 1.8%) **minus 7,600CHF** (land property tax 1.2‰) **plus 695,900CHF** (sell price) **equals -59,200CHF**.

[c] **500,000CHF** (acquisition price of the house with land service) **minus 83,800CHF** (mortgage interests based on a 335,000CHF mortgage (2/3 of 500,000CHF – 1/3 owner's capital, 2/3 mortgage) at an average interest rate of 2.5%) **minus 10,700CHF** (property transfer tax 1.8%) **plus 500,000CHF** (sell price) **equals -94,500CHF**.

[d] Average 10 year rent for a five rooms flat in a rural commune of the canton of Berne between 2000 and 2014 (BFS, 2016a).

Various explanations for land hoarding?

Through the ex-course on the emphyteutic lease, I wanted to show that a demand for housing in the region of Huttwil can exist, as the land of the *Herdgemeinde*'s building land has been largely developed. Therefore, if the landowners in the other parts of town do not develop their land, other interests prevail, such as the will to save land for their children (see Burgergemeinde of Wiedlisbach in section 3.2.1, or the expectancy of a higher financial return[58].

3.3.5 Impact on value redistribution

Local factors as main explanation

The case of building zone reduction in Huttwil illustrated the limited margin of manoeuvre of the communal executive body when it comes to decide upon a withdrawal of development rights. The communal executive body used the commune's obligation to establish a hazard map in order to suspend the planning process. It then depoliticised the zoning issue by delegating the decision on the land's constructibility to external experts. Despite the legal feasibility of the outzoning operation – the plots were not serviced, a withdrawal of development rights without compensation is not acceptable for local actors. The communal authority does not risk to decide against its planning committee (and the communal legislative body?) on the removal of the building zone in Thomasbode (or Sonnegg, Hueb or Hohlen), despite the canton's support on the issue.

[58] M. Jampen and H.-J. Muralt, *op. Cit.*; C. Schneider, *op. cit.*

Densification as value compensation mechanism

The result of the building zone reduction is that a limited value redistribution takes place where the commune resorts to an external expert in order to decide on the land's constructibility and elaborate an additional plan for the development of Thomasbode. This renewed legal document brings two advantages to the commune: the local authorities' participation in land service costs is reduced and allows a reduction of approximately one third of the constructible perimeter (10,000m^2), whereas it keeps the economic value on the landowners' side constant. In a future local development plan, there will be a small ecological gain over previous plans, as a smaller surface will be developed. Still, the probable destruction of water catchments that are present in the area (see section 3.3.4) will be a net loss. An element that highlights the tight margin of manoeuvre for the commune, concerns the implementation of the land service tax and the tax on added land value created by zoning. The shrinking land prices over (at least) the past fifteen years[59] worked against the landowners' ambitions to value their property, despite the communal financial support. For a long period of time, the commune financed the land service.

Collectivisation of private costs

Low rent favours cheap housing

But as the building rights model has shown, a morose land market does not exclude development. It only reduces the rent that landowners can obtain from land. As semi-public landowner, the *Herdgemeinde* managed to create an amount of added economic value they deemed sufficient (annual rent of 1.625% of a land value around 200CHF/m^2) as well as attract new inhabitants into town.

[59] I could even argue that prices have been constant or slightly declining for the past 25 years, because of the real estate crisis in Switzerland during the 1990s.

3.4 Reuse of polluted soil in Niederbipp

Over the past fifteen years, Niederbipp has experienced significant growth in terms of both population and jobs. It is one of the three regional centres of Oberaargau (Region Oberaargau and Kanton Bern, 2012). The development of a regional industrial zone is, in this study, of particular interest, because it involves the case of a polluted field – a former communal landfill – transformed into an important logistics centre almost without public financial support. However, the fact that it does not require remediation turns out to be the determining factor for the project's success. Further, Niederbipp provides another example of implementation of the Bernese tax on added land value created by zoning, which is of particular interest, as it shows that the applied land price is of central concern to the tax's effective implementation.

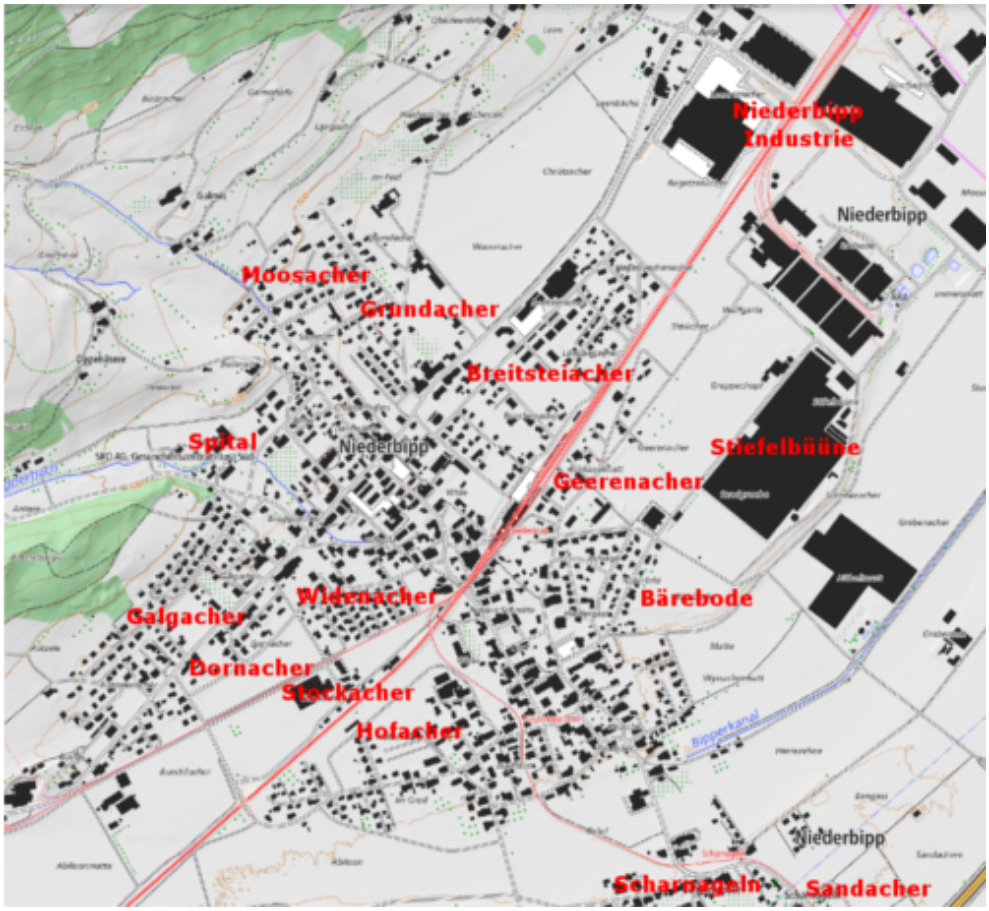


Figure 3.6: Overview map of Niederbipp. Data: (AGR, 1984; Commune of Niederbipp, 1993b). Map: Swisstopo (2014a).

3.4.1 Evolution of land use planning and land use

Zoning changes in 1984

1984 revision hardly documented

Figure 3.7 shows the evolution of zoning and actual land use. The first revision taken into consideration is from 1984, the previous one from 1956. According to the canton (AGR, 1984, 3), main drivers for the revision are the reduction of the building zone and the definition of a new industrial zone, the latter linked to the commune's connection to the N1 motorway. However, the only planning documents available do not show where and how the building zone reductions occurred. Furthermore, there is no calculus concerning the availability and needs of building zone[60] nor in the negotiations or opposition documents. The cantonal decree approves the zoning plan without specific comment and only mentions that areas marked for placement

[60]By the time of approval of the building regulations, the Bernese spatial planning act had not been revised according to the federal act yet.

Year	Land use planning changes	Land use changes
1966		Construction of the Tela Papierfabrik AG, only industrial plant of Niederbipp until 1997
1984	Approval of the revised building regulations, the old ones dating back to 1968 (AGR, 1984)	Few housing and industrial constructions
1993	Approval of the revised building regulations: minor building zone reductions (AGR, 1993)	
1996	Approval of extension of the industrial zone *Industriezone Ost* (Commune of Niederbipp, 1996)	Progressive development of the industrial zone. Accidental fire and destruction of the paper plant. Reconstruction of the plant.
2004	Partial revision of the building regulations: introduction of the tax on added land value created by zoning and extension of the industrial zone	Development of housing, industrial and agricultural constructions (greenhouses)
2005		Construction of the Dentressangle logistics centre
2012	Approval of the revised building regulations (Commune of Niederbipp, 2012)	Extension of the greenhouses

Table 3.5: Main land use planning changes in Niederbipp since 1984.

into the building zone in the future are "generous" in comparison to the existing building zones (AGR, 1984, 6): the extension of the industrial zone is planned in two different locations, in the north where the existing industrial zone is located, and in the south-east, along the motorway. Important extensions of the working zone in the south-west are also foreseen. Besides the extension of institutional zones (hospital, kindergarten), no important changes are discussed or subject to contest, which implies that the previously mentioned reduction of the building zone has been settled during the revision process.

Land use changes between 1984 and 1993

Land use evolution during the following decade is rather modest (**dark grey** on the map), although the time period considered is short compared to the other two case studies[61]. Changes occur mainly in terms of public infrastructure (schools, retirement homes), light industry up north, as well as individual housing construction scattered across the existing settlement.

Zoning plan revision of 1993

Several zoning operations

The building regulations revision of 1993 faced important issues: several perimeters were zoned, only one of the anticipated building zone extensions was realised, and numerous opposition was formulated by landowners against the commune's zoning projects. Another important hurdle was the implementation of the cropland protection plan, a central concern for Niederbipp and its wide, flat agricultural plots.

The zoned areas, (**light purple**, numbered "1" on the map), consist of several plots in Sandacher close to the motorway, one important plot in Grundacher up north, four developed plots close to the Spital in the north west, a bigger plot in Hofacher (centre south) and three smaller plots in the west.

Outzoned plots hardly constructible

The justification for placing the plots around Sandacher were put into the agricultural zone was that they are traversed by high voltage lines, which severely restrict their development. There were two opponents to the decision. One opponent sought only the reimbursement of the land tax paid in excess, and the other did not justify his position, so the procedure came quickly to an end. The plot in Grundacher was designated as agricultural zone after the canton inserted it into the cropland protection plan. As the owner had no intention to develop it, their opposition was rejected.

[61] The time periods are based on the time maps provided by Swisstopo (2014b).

The plot in Hofacher is part of the institutional zone (extension of the cemetery) in the former plan. It was therefore designated as agricultural zone without any demand of compensation. The partially-built plots close to the Spital are part of an actual farm, which makes their zone change unproblematic. In regard to the three smaller plots in the west, one of the owners did not object to the decision. The two others, who own plots on the boundary of the building zone, do not have the right to oppose the communal decision, as their plots are not serviced and their lower constructible parts towards the road have been already developed and sold in the past.

Minor adaptations and first extension of the industrial zone

In matters of building zone extension (light brown, numbered "2" on the map), one can observe several small peripheral extensions, mostly created to adapt planning to actual use and release building and renovation restrictions in the given areas. In fact, the construction changed from a protected zone with tight regulations into a regular building zone. Wider extensions concern the industrial zone in the north, which intends to welcome an additional building of the existing paper company Tela (AGR, 1993, 10), and Geerenacher – close to the recently built school, which is zoned as institutional.

Land use changes from 1994 to 2014

Important development of housing and industry

Between 1993 and 2014, construction in Niederbipp increased significantly: major development occurred in the northern part of the industrial zone (see section 3.4.4). In terms of housing, entire neighbourhoods were erected: eight homes hosting several apartments in Breitsteiacher, over 40 single family homes in Widenacher, about 20 single family homes around Galgacher, twelve double-family homes in Sagimatt, and around 20 single family homes in Moosacher.

Zoning plan revisions between 1996 and 2014

Besides the massive extension of the industrial zone described below, there is no other significant zoning change, except a slight reduction of the building zone in Stockacher (dark purple on the map) – which was excluded from the local development of Widenacher – and a minor extension near Scharnageln (yellow, numbered "3" on the map). Further, the important changes linked to the creation of industrial zones were made in specific procedures.

Gap between zoning and land use

Similar to Wiedlisbach, the building regulations revision of 1984 was approved with a huge building zone reserve, which explains a significant remaining gap between the use foreseen by regulations, and the actual land use. Construction occurs almost exclusively within the building zone, demonstrating the efficacy of zoning as a means of delimiting constructions. There are two wide grey squares in the east of the settlement area (numbered "4" on the map): these are greenhouses used for hydroponic agriculture, considered an agricultural land use.

Sudden fill of the building zone

Niederbipps development occurred in a shorter time span and more abruptly than the previous two cases. In the 1980s until the end of the 1990s, nohousing investors appeared. Between 1995 and 2000, Widenacher and Galgacher started to develop, whereas the other construction essentially began in 2005 and is still ongoing. According to the communal head of administration of constructions[62], a construction boom began in 2008 and has not subsided.

Remaining not built plots

Hoarding remains an significant phenomenon

As one can read from the map, significant building zone reserves (in terms of housing) still exist. The most important reserves are in Stockacher and Hofacher, both attributed to a mixed zone, the latter being part of a local development plan. With exception of the remaining undeveloped plots in Breitsteiacher, meant to host single-family

[62] R. Suter, *op. cit.*

homes, most of the other building zone reserves are zoned as two or three storey residential zone. The fact that construction activity recently experienced growth speaks against the hoarding behaviour of landowners.This evidence alone, is not enough to justify the remaining important gaps: discussions led by the communal executive body to convince the landowners to develop were not followed by behavioural change. Vehement opposition by landowners dissuaded the commune to take further legal action against them[63].

[63]R. Suter, *op. cit.*

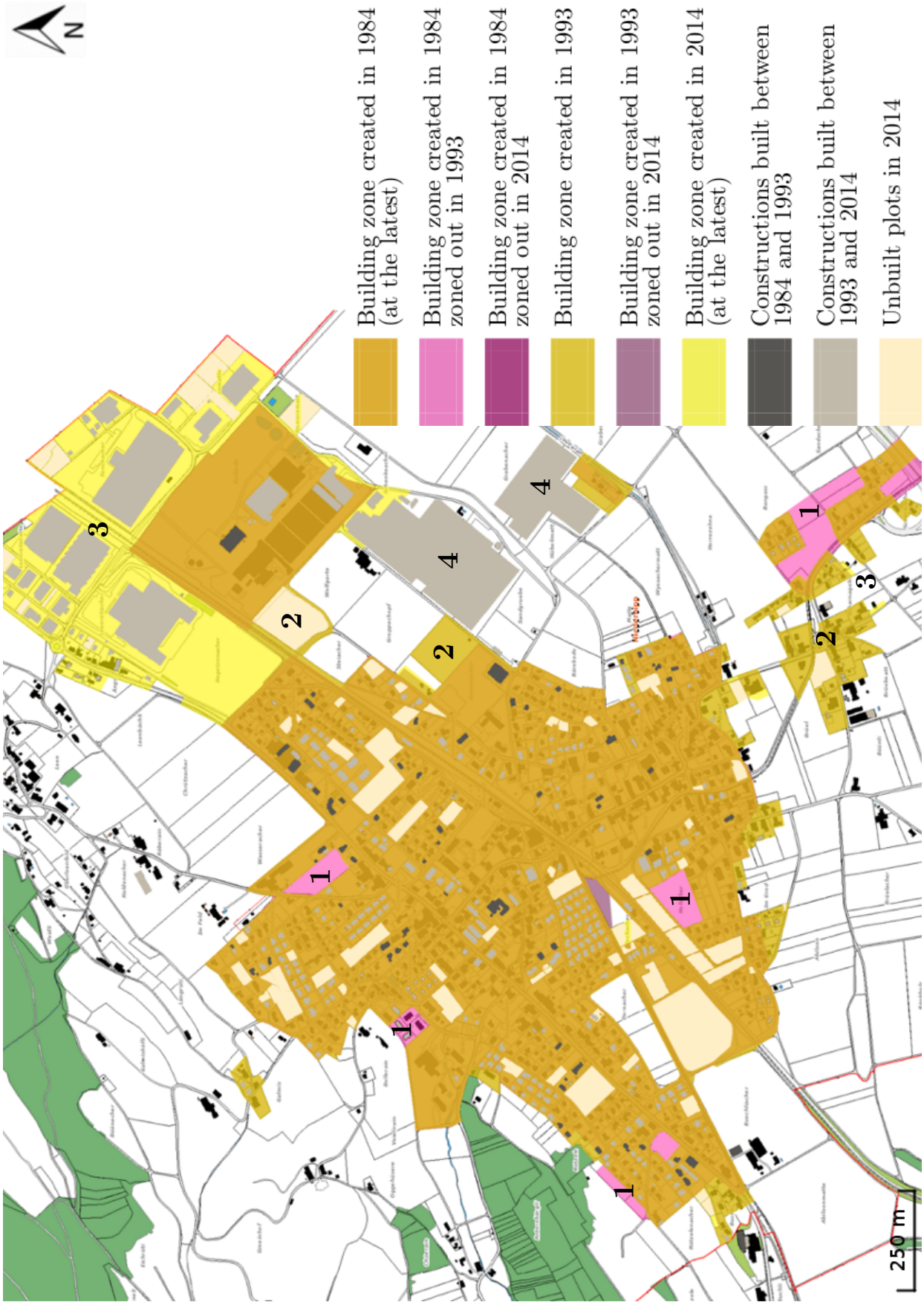


Figure 3.7: Land use planning and land use evolution in Niederbipp from 1984 to 2014 (Map: OSTAG Ingenieure AG (2014); Swisstopo (2014a); Commune of Niederbipp (1993b).

3.4.2 Contextual factors

Demographic evolution

25% population growth over 20 years

Over the last 20 years (1993-2013), Niederbipp experienced a population growth of 25.5% (from 3,482 to 4,371 inhabitants), an average annual growth rate of 1.28% (BFS, 2015). Compared with the neighbouring communes, it is in the upper tier of growth. Over the same period, only Oensingen (5850 inhabitants) in Canton Solothurn, and Schwarzhäusern (500 inhabitants) experienced high growth. Between 1993 and 2013, Oensingen experience a population increase of 43.8% (2.19% per year on average) and Schwarzhäusern 28.1% (1.4% per year on average). Oberbipp (1650 inhabitants, 18.0% growth or 1.0% growth per year) and Kestenholz (1750 inhabitants, 20.7% growth, 0.9% growth per year) in canton Solothurn are also fast growing communes. In comparison to these communes, other surrounding communes have a slow growth: Balsthal 2.7% (5836 inahbitants), Laupersdorf 2.7% (1682 inhabitants) and Bannwil 0.9% (691 inhabitants).

1.28% yearly growth in Niederbipp, 0.84% in Switzerland

Compared to regional, cantonal and Swiss averages, Niederbipp is far above regional, cantonal and national growth rates (respectively 4.9%, 6.4% and 16.8% total growth or 0.25%, 0.32% and 0.84% annual growth).

In terms of flat vacancies, the available data does not allow us to draw any conclusion, as there has been high construction activity over the last decade. In 2011, the vacancy rate was around 3%.

Economic and fiscal evolution

High job supply

Inhabitants of the commune have a fiscal capacity above regional average (932CHF per month compared to an average of 825CHF per month). Since 2001, the number of jobs increased from 1,450 to 2,250. With slightly more than one job for two inhabitants, the job supply is also far above average (30 jobs per 100 people regionally).

Low taxes

Tax rates for natural persons have been lowered over the last ten years and are among the lowest in the region (1.35 in Niederbipp and 1.59 on average) (FIN, VVYYa). These rates compete with those found in Schwarzhäusern (1.39) and Langenthal (1.38). The land tax rate is also below average (1 instead of 1.12), as in Schwarzhäusern and Langenthal (FIN, VVYYa). The communes further west (Oberbipp, Wiedlisbach) however, have a higher rate. It is difficult to directly compare the tax levels with the neighbour canton of Solothurn. However, according to Brülhart (2014), combined cantonal and communal taxes are, on average, higher in Solothurn than in the canton of Berne. Nevertheless, as the commune of Oensingen has a tax rate clearly under cantonal average (Amt für Finanzen, 2003, 2013), it has a higher fiscal attractiveness than the neighbouring Bernese communes (Brülhart, 2014).

No price data available

In regard to land prices, it was not possible to find data specific to industrial land, which is the type of land use that is studied in the present case study.

Topographic and spatial characteristics

Agricultural land ideal for construction

Located further east of Wiedlisbach, the commune is on the border of the canton of Solothurn. The commune's northern border is delimited by the Jura mountains, and its southern border by the Längwald forest. While the central and biggest part of the communal territory is flat land of high quality, principally devoted to agriculture (Swisstopo, 2014a), it is also where settlement and the entire industrial complex is located.

In terms of transport, the train network grants direct connections to Olten (22 minutes away; departing every twenty minutes) and to Solothurn (15 minutes away; departing four times per hour). Travel time to Zurich or Berne is approximately one hour with connections every half an hour to Zurich and four times an hour to Berne. In terms of individual transport, the N1 motorway crosses, approximately, the middle of the commune, and has an interchange granting access to Berne in approximately 40 minutes and to Zurich in an hour.

3.4.3 Constraints of superior law

Cantonal land use planning policy

Starting with the building regulations revision of 1993, the main constraints of superior law become evident. In order to implement the federal cropland protection plan and protect Niederbipp's high quality agricultural land, the canton defined several reserved zones on the the commune's agricultural land zoned as building zone. The removal of the reserved zones required the commune to revise their zoning plan and to reduce their building zones in the most sensible areas (**light purple**, numbered "1" on figure 3.7). Despite these building zone reductions, the building zone dedicated to housing remains massively oversized (AGR, 1993, 8f). The commune has 16 hectares that are zoned as housing zone an remain not built (in regard to a maximum of 11 hectares allowed), whereby the needs are calculated generously:

- maximum plot ratio of 0.4 – despite the fact that several local development plans foresee higher ratios (up to 0.85);
- mixed use of the housing zone with up to 40% of non-housing uses, whereas usual calculation standards foresee 20
- an average flat size corresponding to the 2014 standards;

Limited zoning out procedures

Reasons mentioned for the difficulty to reduce the building zone are the numerous "holes" within the settlement area. In the long run, agricultural production on numerous plots is not sustainable. Further, the fact that part of these plots are serviced hampers the zoning process. In addition, part of the landowners' objections to the cropland protection plan had been accepted by the canton in 1987. For matters of legal consistency, the 1993 building regulations revision that implemented the cropland protection plan, had to take into account the objections formulated in 1987. Despite more than 40 oppositions voiced against the new building regulations, no objection was filed against the planned extension of the industrial zone (AGR, 1990).

Economic development about to begin

With the creation of the cantonal priority development areas program in 1989, the industrial zone of Niederbipp was about to become a cantonal priority. This policy allows the canton to grant planning subventions to the designated areas, and facilitates specific measures and derogations to authorized street capacities, noise, and pollution levels (ARE, 2003, 14). During the 1993 building regulations revision, the office of economic development supported the first small extension of the industrial zone (**light brown**, numbered "2" on the map) and underlined the cantonal political support that the planned industrial development benefits. The future idustrial development is extensively mentioned in the cantonal decision approving Niedrbipp's building regulations. Further, the cantonal decision approving the communal building regulations is signed by the Minister of the Department to which the spatial planning office belongs.

Remediation of contaminated sites policy

Extended ground analyses required

Because our case involves polluted soil, I briefly explore the main constraints set by environmental legislation in regard to these sites. Legally[64], the remediation or redevelopment of a brownfield is conditioned by the type of pollution, the level of pollution of soil and by its spread through the nearby soil and groundwater. If the legal pollution levels of soil are exceeded, extended analyses have to be conducted to establish need for further intervention. If the toxic material is spreading and the legal maximum values for one or several toxic substances is exceeded in the immediate downstream of the plot, remediation becomes mandatory[65].

The technical ordinance on waste[66] distinguishes three types of landfills: landfills for inter materials, land fills for stabilized residues and bioactive landfills. The landfills have to be registered and an inventory of their content (types and quantities of waste stored) must be kept up to date. In the case of the landfill *Müllergrube* presented in

[64] Art. 16 of the *Federal ordinance of 26 August 1998 on the remediation of polluted sites*, SR 814.680.
[65] Art. 9, 10, 11, 12 AltV, SR 814.680.
[66] Art. 22 of the *Technical ordinance on waste TOW*, SR 814.600.

section 3.4.4, the content of the land fill was partially unknown and extensive analyses had to be conducted to establish its content.

Monitoring obligation

Remediation can be achieved in two ways (art. 16 AltV): either through remediation, (elimination of the environmentally hazardous substances), or through securitisation of the site, (the prevention and monitoring of the diffusion of environmentally hazardous substances). In order to further secure the site, the pollution level around the contaminated site (*e.g.* nearby soil, groundwater up- and downstream) must be monitored. This obligation is part of the confinement prescriptions (art. 16 AltV).

Regional coordination of development

Regional policy

In terms of regional planning, the communes of Wiedlisbach, Oberbipp and Niederbipp, since the 1990's, have been in the perimeter of the priority development area policy, which means that the canton can subsidise planning activities, grant funds to development projects and offer travel credits (AGR, 2000)[67]. Since 2007, under the supervision of the cantons of Berne and Solothurn, an intercantonal study between Oberbipp and Oensingen was launched, later extended to Wangen an der Aare. This study led to the signing of an agreement between the five communes and the two cantons to coordinate development and establish a list of criteria that allows to evaluate future settlement areas (Solothurner Zeitung, 2014). The agreement's effects on the implementation of land use planing policy, namely the inter-communal definition of new housing, commercial and industrial zones could not be observed yet. In 2012, Niederbipp was defined as a working area of regional importance by the regional structure plan, which obligated the commune and the canton to make land available for development by the means they deem appropriate (Region Oberaargau and Kanton Bern, 2012).

Building permit prescriptions

Length limit for piles

The central issue for the development of a polluted site that is not undergoing remediation, is to prevent the spread of the hazardous substances.Prevention is especially important during the construction phase, considered the most sensitive (AWA, 2005). The nature of contaminated sites can make them a challenging place for construction, particularly for landfills. The landfill ground consists of different types of wastes, of various solidity, density and toxicity, all of which stands in contradiction to solid basement requirements. In construction, a frequently used technique to ensure the stability of a building is to put pillars in the ground to prevent movement. In the case of a polluted site, this pillar technique is problematic, as it might pierce the waste deposit, and facilitate the exfiltration of toxic liquids.

Additional planning measures

The building permit required an emergency plan in case pollution spreads during the construction process (Prefecture of Wangen, 2005). Further, a plan in regard to the reuse of the excavated ground during the construction process must be submitted (FOEN, 1999). In addition, an adequate permanent gas drainage system must be set up in order to safely evacuate ascending landfill gas (Prefecture of Wangen, 2005).

3.4.4 Local use of instruments

Context of development and actors' positions

An industrialisation wave coming from the east

Until the major extension of the industrial zone *Industriezone Ost*, one single factory existed in Niederbipp: the Tela paper plant. However, the adjacent commune of Oensingen, part of Canton Solothurn, has established a growing industrial zone over the past decades. The success of their neighbour may have provided Niederbipp the will to develop, and the will to shed their rural status. Interviewees[68] mention a temporal shift between the construction of the motorway in the 1960's and development pressure coming from the east, (Aarau, Olten and Oensingen), a transformation that progressively takes over the Bipperamt.

[67] Travel credits are part of the Bernese *Fahrleistungsmodell* which is not presented further here. Please refer to `http://www.vol.be.ch/vol/de/index/luft/luftreinhaltung/verkehr/fahrleistungsmodell.html` for further information.

[68] R. Suter, *op. cit.*; R. Wyss, heritage and landscape activist, interviewed in Attiswil the 26 March 2014.

Environmental requirements induce wider industrial development

The *Industriezone Ost* project was born in the mid 1990's when the commune, petitioned by Tela for their proposed expansion[69], decided to extend the industrial zone by 2 hectares. However, in order to comply with the requirements of the extension's underlying environmental impact assessment, the construction of a new road, and an underpass crossing the train tracks was required[70]. As these costs were high, a general extension of the zone was put on the table by the commune and , which would make it possible to divide land service costs among the different landowners[71].

Separation between regular building regulations revision and industrial extension

Ongoing discussions between the commune, the planning authority, and the cantonal office of economic development on the current project's maturity (negotiation with landowners, land service plan, costs division, approval by the communal legislative body) lead to a separation between the ongoing revision of building regulations, approved in 1993 (AGR, 1993), and the future extension of the industrial zone, approved in 1996.

Political and administrative support

Within the cantonal administration, the office of economic development strongly supported industrial development, and offered a credit of 1.5 million francs for servicing the zone, reimbursable within 10 years (AGR, 1990). The office of economic development cited the high degree of commune accessibility to the motorway, proximity to the existing industrial zone of Oensingen and Tela's desire to expand, as justification for the industrial development. The department of the cantonal spatial planning office supported the development through the priority development areas program mentioned in section 3.4.3.

Agricultural considerations politically out weighted

As the totality of land taken into consideration is part of the cropland protection plan, the agricultural office was opposed to any extension. However, the agricultural office shares the same directorate with the office of economic development and was aware that their opposition would not be supported by the responsible cantonal minister[72]. In fact, the minister offered a 1.5 million francs credit for the land service of the new zone and personally signed the support letter addressed to the commune (Commune of Niederbipp, 1993a)[73].

First stage of development of the industrial zone

Property fragmentation

The perimeter considered is composed of 15 plots located at the eastern border of the commune: they consist of flat agricultural land and include the former communal landfill. Twelve plots are privately owned, one plot is owned by the Canton of Berne, and one by the commune of Niederbipp. Another plot is property of the Flurgenossenschaft Niederbipp, a cooperative composed of all landowners of the commune, whose main function is to maintain roads and paths across the communal territory. This cooperative is financed by the rent obtained from member's properties. In regard to the privately owned plots, the biggest is owned by Tela, the paper company already present on site. Six further plots were bought by the company before the actual development.

Wide, flat and optimally connected area

The total constructible surface is approximately 16 ha, the part north of the rail tracks 6 ha , and the southern part 10 ha (the site of the Tela factory). The SBB tracks connect Solothurn to Olten (Jurasüdfuss line) and the Aare-Seeland-Mobil tracks connect Solothurn to Oensingen and Langenthal. The nearest motorway access (N1 Berne – Zurich) is less than 2 km away.

A detailed land service contract

At the heart of the development operation was a land service contract[74] (*Planungs- und Infrastrukturvertrag*) signed between the commune and the landowners. It preceded the zoning operation. In order to ensure that the zoned land will be effectively developed, and that the commune does not bear all development costs, an agreement defining the financial contribution of each landowner to the service of the perimeter and ensuring the payment of these contributions was signed. The contract contained

[69] Tela is a paper company employing 300 people in Niederbipp since the 1960's.

[70] Art. 2 of the Draft contract *Planungs- und Infrastrukturvertrag zwischen der Einwohnergemeinde Niederbipp und den Grundeignetümern im Perimeter der Überbauung* "Industrizone Ost".

[71] The contract signed between the commune and the different plot owners estimates road and underpass construction at 4.5 million francs in total.

[72] It is not the same minister who approved Niederbipp's building regulations!

[73] *Letter of the 3 August 1993 from public economy directorate of the canton of Berne addressed to the executive of the commune of Niederbipp concerning* "Industriezone Niederbipp / Erweiterung und Erschliessungshilfe".

[74] Contract of civil law, as defined in the *Code of Obligations*, SR 220.

the following main elements:

- the local development plan (*Überbauungsordnung*) with building restrictions such as type of use[75], maximal building sizes, minimal distances to other buildings, a minimal "green coefficient" as well as the detail land service plan of the plots;
- the amount charged to each landowner in regard to planning costs, base land service costs and detail land service costs;
- the date of payment of these fees;
- the payment guarantee through first rank mortgages;
- the party bearing exceeding and additional costs (notary, geometer, land registry) which is in the present case the commune.

Total land service amounts to 500,000CHF/ha

The contract foresaw that 100% of the detail land service costs would need to be paid by landowners. These costs amounted to approximately 7.4 million francs and included land service in terms of electricity, table water, sewer, rainwater drainage, and the construction of small streets. The basic land service costs amounted to approximately 3.6 million francs. Eighty percent of these costs were paid by the landowners (20% by the commune); this percentage corresponds to the legal maximum[76]. The planning costs amounted to 180,000 francs; 2/3 were paid by the commune, and 1/3 by the landowners (divided proportionally according to the amount of land they own). Divided by the entire surface (approximately 22 hectares) that was serviced, the total land service costs amounted to approximately 500,000CHF/ha.

Second stage of development of the industrial zone and tax on added land value created by zoning

Contractually defined tax amounts to 30%

In 2007, the industrial perimeter was extended by 11.2 hectares on the northern side of the railway tracks. For the first time since the partial revision of building regulations in 2004, the tax on added land value created by zoning was implemented on a large scale. The formula was as follows: the original land price is set at 15CHF/m^2, the new land price at 90CHF/m^2, which results in an added value of 75CHF/m^2. This added value is taxed, according to the signed agreement, at a 30% rate, which amounts to 22.5CHF/m^2.

Vague regulatory specifications

Communal building regulations do not specify the percentage of added value to be taxed. They mention that "equality in front of the law" and "specific cases" have to be taken into consideration, and further, that the taxed amount should be "appropriated"[77].

Effective tax rate is closer to 21%

The zoned plots have basic service, but no detail service[78]. Based on the cost calculation made for the first part of the industrial zone, detail land service costs of approximately 3.5 million francs would apply[79], *i.e.* 35CHF/m^2. If more realistic land prices before and after the zoning process are taken into consideration – *e.g.* 5–10CHF/m^2 for agricultural land and 150CHF/m^2 for industrial land[80], the actual added value is as follows: 150CHF (new value) - 10CHF (old value) - 35CHF (land service) = 105CHF. Therefore, the actually applied rate is more around 21%.

The calculation method for the tax on added value created by zoning presented above shows the degree of manoeuvreability that the commune had in implementing their new instrument. It also shows that the implementation of the instrument is recent. With its introduction in 2004, the commune seized the opportunity to capture over 2.5 million francs while adopting the second extension of the industrial zone.

No earlier implementation of the tax possible

If the instrument would have been implemented earlier, it could have been applied

[75] Commercial centres exceeding 500m^2 are prohibited. Certain areas closer to housing areas are exclusively dedicated to tertiary uses (Commune of Niederbipp, 1998)

[76] Art. 112 al. 1 let. 2 BauG, SR-BE 721.0.

[77] Art. 47, *Building regulations of 11 June 2012 of the commune of Niederbipp.*

[78] R. Suter, *op. cit.*

[79] As no access to the land service contract was given, I apply the detail land service costs per hectare calculated for the development of the first part of the industrial zone.

[80] The industrial land price is the one applied to land during the development of the first part of the industrial zone.

solely to the first extension of the industrial zone (no other extension of buliding zone has taken place since the introduction of the instrument in cantonal legislation in 1985). But the instrument's use would have either required a specific revision of building regulations in order to adopt the necessary legal basis, or its implementation during the 1993 revision. Given the short time span between the building regulations revision of 1993 and the elaboration of the land service contract in 1996 as well as the high controversy of the last building regulations revision (on the implementation of the cropland protection plan), both options seem highly improbable.

Development of the polluted plots

Several companies established themselves in the new industrial zone which served to raise awareness of the location[81]. Different buyers were interested to develop the former communal landfill, but their projects were checked by geotechnical and financial constraints. The development of the plot could be authorized by the cantonal waste and water office (AWA) only after detailed ground analyses were made (paid by the future developer) and the definition of a precise construction technique set.

Entry into registry of polluted soils

The cantonal land registry provides the following information in regard to the polluted site: the *Rotboden/Müllegrube*, object number 09810014, is currently divided into six plots[82] for an approximate surface of 79,003 m^2. The volume of the contaminated material buried in the ground is estimated to 1,550,800 m^3. The landfill was opened in 1960, and closed in 1992; the first presumptions that the site was polluted were reported in 1995 (AWA, 1995); the entry in the registry of polluted sites was made on 29 September 2005. As sample analyses show, the site contains (in addition to excavation residues and rubble), the following toxic elements: organochloride, chemicals, solvents and polycyclic aromatic hydrocarbon (AWA, 2014).

Unstable soil structure and proximity of a water catchment

According to the AWA and the Geotest AG (AWA, 2005), several development projects were already in line before, but cancelled for financial and geotechnical reasons. In fact, two issues are problematic for the development of the site: the soil structure and the proximity of a water catchment:

- the soil structure is unstable in the sense that the deposited waste varies in terms of density and consistency within the deposit volume. The litter is somehow dispatched across the landfill and subsequently threatens the construction's stability;
- the proximity of a major water catchment[83] (700 meters) makes potential drainage of waste liquids into the groundwater highly problematic, as this would pollute the water and severely restrict the catchment's use. Two main external factors can lead to such infiltrations: the drainage of water from the surface through precipitation, and a physical intervention into the landfill through the construction of foundations, particularly deeply-rooted pillars, greatly facilitate the spread of liquids, as they hold the potential of piercing the entire mass of litter (which would greatly facilitate the spread of toxic liquids into the ground)[84].

Cover to prevent future infiltrations

From a legal point of view, the owner has no obligation to remediate a plot, as long as the thresholds of pollutants in nearby waters do not exceed legal boundaries. Therefore, in order to minimize changes in the deposit's structure and prevent infiltration into groundwater, one solution is to cover the concerned perimeter, rendering it impermeable to potential infiltration. As no intervention is legally required by the current situation, the construction of a cover would only be effective in case of development.

Limited risk of exfiltrations

In 1998, first analyses were conducted by the cantonal water protection office showed a low level of pollution in the groundwater downstream of the landfill (AWA, 2005). In 2000, further analyses produced similar results, once even exceeding the legal limits, qualifying, in theory, for remediation. In order to determine if there is an actual

[81] According to the communal planner, Zellstoff-vertriebs-GmbH, Ophardt, and Ducati were the first companies to establish themselves in the industrial zone.

[82] Plots number 282, 984, 2108, 2092, 2091 and 2072 (AWA, 2014).

[83] The catchment provides an important part of the drinking water for Oensingen; between 1,000 and 5,000 liters per minute are subtracted from the groundwater.

[84] J.P. Clément, Head of the Research Department on groundwater and contaminated sites, interviewed in Berne 14 Max 2014.

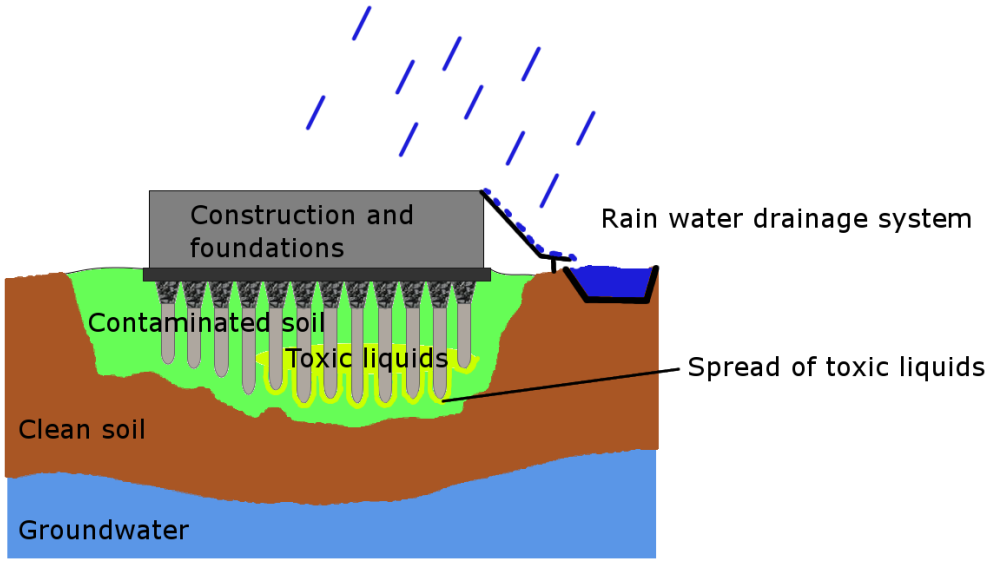


Figure 3.8: Constraints of construction on the landfill *Müllergrube*. Own representation.

need for remediation, and if the plot could potentially be developed, an extensive study had to be conducted including dozens of boreholes and various sounding techniques (AWA, 2005, 66). Further, an exfiltration model was conceived in order to calculate the probability of exfiltrations in case of development. These analyses showed that the risk of pollution was low, and that the chances for groundwater contamination were rather low and temporary.

A logistics centre as lid

The construction of a logistics centre on top of the landfill is a suitable cover for the waste pit, as its surface (30,300 m^2) covers more than a third of the landfill's estimated surface. The weight it has to support and the depth of the pillars can be problematic: the pillars cannot exceed the height of the buried waste, as otherwise toxic liquids would drain through and spread. The cantonal office sets a minimum of 5 meters between the bottom of the pillar and the bottom of the landfill (AWA, 2005). Contrary to other, higher precision industries, soil instabilities are less important for a logistics centre. In order to support the building weight, 8,000 pillars of concrete, combined with gravel columns on top, are drilled into the ground.

10 years financial guarantee against potential contamination

In order to reduce risks in case of groundwater contamination, an emergency plan with intervention measures had to be elaborated by the new owner. As the groundwater is located at a depth (25-30 meters from the surface), and the aquifer is composed of significant quantities of water (the standing water can reach a height of 40 meters), intervention measures are technically and financially limited to the securitization of the existing catchment. For this purpose, the developer deposited, for ten years, a significant financial guarantee (AWA, 2005, 66). If contamination does occur after the 10 year warranty, or within the 10 year warrants, and the remediation costs exceed the owners deposit, public authorities bear the additional costs.

Analyses and additional construction costs passed on in transaction price

The analyses conducted to assess and minimize risks, the boreholes and sounding techniques used and the additional construction costs that the developer had to support were passed on to the former plot owner through a discount on the land price. Instead of a price approximating 150CHF/m^2 as for the other plots of the industrial zone, the price of the landfill was set at approximately 120CHF/m^2. The difference of 30CHF/m^2 was supposed to cover the additional expenses supported by the logistics company and the fact that the plot was not sold but leased throug ha building right. The initial sale price of 150CHF/m^2 has been recommended by the commune to the various owners in order to ensure a quick development of the area[85].

3.4.5 Impact on value redistribution

Costs of analyses as hurdle to development

Considering the analysis of the past sections, I can draw a set of conclusions, specifically regarding the value redistribution process implied by the polluted site's develop-

[85] R. Suter, *op. cit.*

ment.

The costs of analysis as hurdle for redevelopment

Conducting in-depth studies to assess the risk of contamination is a hurdle for the reuse of polluted soils, as potential developers bear additional costs of analyses, impact assessments, and further securitisation and prevention measures and pass on part of it to landowners. This follows the general legal principle that the polluter should bear the costs of their pollution[86], but can block the site's redevelopment.

Either everything or nothing

The potential reuse of a polluted plot is tightly linked to both the remediation obligation and the underlying costs: if there had been an obligation to remediate the landfill, the remediation costs would greatly exceed any profit use[87]. In the case of the landfill, the creation of a lid on the landfill solved the cost issue via a 20% price reduction on the lease (compared to other land sale prices in the industrial zone). This reduced transaction price only reflects the costs linked with the ground analyses, the financial guarantee in case of pollution spread, and the development of the plot, but is minimal compared with what a a remediation would cost. In the end, the added economic value created through zoning remains mostly in the hands of the landowner. In matters of ecological value, the lid reduces the probability of water infiltration and limits potential future value loss, but also limits any future remediation measure, as it seals a wide part of the area.

Specificities of the case determinant

Local geophysical constraints make the management of the each contaminated site a specific case: the case of Niederbipp is particularly sensitive, because of groundwater and the nearby water catchment's proximity. The water pollution act of 1972 forbade the establishment of landfills close to catchment locations (Dupuis and Knoepfel, 2015, 93), but the *Müllergrube* was already in use by that time. The fact that the maximum legally allowed value for ammonium was only exceeded once seems fortuitous. If other exceeding values would have been measured, remediation would have been mandatory, and the private redevelopment of the site would not have been possible.

Land sold four times

The present case has shown how development of polluted soil can be a good deal for both the buyer (if willing to bear a temporary risk), and the seller (who keeps the major part of the added value). Reflecting on the land's uses over time, it is possible to state that the seller is paid by the land in four ways: they rented the land surface to a farmer for agricultural production, they sold the gravel excavated from the soil, they sold the storage volume for the landfill, and finally they leased the plot itself to the logistics company.

Environmental legislation leads an extension of the industrial zone

Further, the obligations set by the environmental assessment report required important investments in land service. In order to reduce the land service costs (that would otherwise exceed the value of the land intended for zoning), the commune decided to extend the perimeter of the industrial zone, distributing the costs among a wider number of landowners. This decision shows how the constraints set by environmental legislation have contributed to an extension of the industrial zone.

Emergence of a growth coalition

The fact that the main employer (who is also the main landowner) planned to extend their activities was, for the commune, a sufficient reason to orient its communal strategy towards industrial development. Together with the canton's legal and financial support for economic development, a growth coalition which included communal and cantonal authorities, as well as the landowners was created. The land sale price negotiated between commune and landowners made rapid development of the industrial zone possible. A noticeable fact is, at the time of writing (2014), the plots that the paper company initially intended to develop, the starting point of Niederbipp's entire industrial development, remain undeveloped. One explanation could be the 1996 paper plant fire. This fire likely had a financial impact on the company's strategy. Additionally, the company was bought by Kimberly-Clark in 1999 (Kimberly-Clark, 1999). The change of ownership from a Swiss company to a multinational owner likely led to organisational changes.

[86] Art. 2 of the *Federal act of 7 October 1983 on the protection of the environment*, SR 814.01.
[87] J.P. Clément, *op. cit.*

Chapter 4

Redistributive capacity of current institutional regime of soil

The present chapter analyses the results gathered in the previous parts of this working paper – the analysis of Oberaargau on a regional scale, the analysis of the institutional regime, and of the case studies – and places them in a general perspective with the aim to evaluate the redistributive capacity of the current Swiss, and in particular, the current Bernese institutional regime of soil. The weaknesses identified in this regime are subsequently discussed, along with anticipated cantonal legal changes currently being discussed, in order to determine if and how these changes contribute to a better redistribution of economic and ecological values.

4.1 Typical issues of peri-urban spaces confirmed

The above analysis shows that several characteristics typical of peri-urban spaces are confirmed in the case of Oberaargau. The studied building regulation's revisions show that these post-rural communes possess the general will to outsize demographic and economic growth by making cheap land available for development through zoning operations, but mostly without control on land ownership. This policy results in more or less oversized, fragmented, and spatially dispersed building zones, and unrealized development objectives. However, ex-post reduction of oversized building zones is hampered by Swiss property rights and the underlying risks of compensation for material expropriation. Out of fear of conflict and respect for previously acquired rights, communes show great reluctance to implement such reductions and prefer to maintain consensus. Therefore, agricultural land that is in the building zone is hard to protect and is subject to an increased risk of urban sprawl within the building zone shows up. This risk is accentuated by the general communal tendency to simplify building regulations in order to foster the development of these building zones. The consequences are an increase in land service costs, and suboptimal development of the building zone. The paradox is that recent land service costs tend to be borne by landowners, which creates a disincentive for the communes to correctly dimension their building zones.

In regard to the reuse of polluted soils, although only one case has been analysed, there are significant difficulties in the reuse of contaminated sites, because remediation costs greatly exceed industrial land prices, severely limiting economic reuse of these soils. Further analysis of other cases is required in order to make more detailed assertions.

4.2 Subregional disparities allow the test of redistributive instruments

Regional analysis shows that Oberaargau deals with important subregional disparities: the north of the region, and the centres around Langenthal and Herzogenbuchsee are more developed and highly urbanized: they encounter higher demographic and economic growth than the rest of the region. The south remains oriented towards agriculture, and most of these southern communes fight to maintain population and jobs. Proximity of transport infrastructure, like the motorway and national train lines, plays a major role in economic and demographic development. These regional disparities make Oberaargau's regional perimeter particularly relevant for testing instruments which redistribute economic and ecological values created by land use dynamics and land use planning policy.

4.3 Opposition between the use of redistributive instruments and communal attractiveness

A contradiction within communal policy can be evidenced with regard to the implementation of redistributive land use planning instruments, and the commune's attractiveness for landowners or investors: Redistributive instruments (such as the land tax) allow the commune to generate rental income from the land, which makes private land possession less attractive than in other surrounding communes that do not use the instruments or apply lower rates. The contradiction is found in the fact that the communes that need the most such redistributive instruments (because of tight financial budgets, hoarding issues, oversized building zones, etc.) are precisely those that lack sufficient locational attractiveness for land buyers and investors. As a consequence, the implementation of redistributive instruments in "unattractive" communes effectively works contrary to betterment of the situation. This displays the underlying issue of scale in the implementation of the land tax.

The situation does theoretically not apply to the tax on added land value created by zoning, because it is essentially the landowners (those who already own land in the commune) who carry these additional costs. In fact, it is their rent that the tax on added land value created by zoning captures and not the investor's or the buyer's rent. In a declining market, if landowners want to sell their land at a price that no investor is ready to pay, they cannot pass on the "rental loss" that the tax on added land value created by zoning imposes to them on the investor, because their sell price is already too high. The situation is comparable in a rising market, because the buyer will usually only pay a price in accordance to the benefits they can obtain from land in the near future. Landowners can pass on the tax on the buyer only if prices will continue to rise, which is never certain. As the use of building rights in Huttwil has shown, it is only through a reduction of the landowner's rent pretensions that development can occur. The tax on added land value created by zoning only taxes a potential price difference between a former and latter legal state of rights on land. If there is no price difference between the former and latter state, for example, because there is no buyer, then there is no tax!

Notwithstanding this fact, communes tend to procrastinate in the implementation of voluntary cantonal instruments (like the tax on added land value created by zoning or the land service tax), or to use them restrictively. This may be explained by the fact that such instruments add additional hurdles to the decades of negotiations with landowners. Thus, the communes use them as a reaction to the problems that these instruments were intended to solve: instead of having anticipated the difficulty of forcing landowners to develop their land and the costs linked with the service of land, the communes have inherited a blocked situation and now try to regain some margin of manoeuvre by capturing value and passing on costs to the landowners. This situation can be often explained by former interlocking interests of communal authorities and landowners[1].

Moreover, when trying to regain room to negotiate, reducing excessive building zone reserves is an option used only marginally, because it arises a conflict that is

[1] C. Schneider, M. Jampen and H.-J. Muralt, *op. cit.*

unlikely to born politically.

4.4 Lack of building obligation

In the three case studies analysed, important building zone reserves, often in the form of single plots, have been identified. The lack of an instrument or means of forcing construction is also mentioned by the local political administrative actors. The only current option works with land that is not yet zoned. It consists of a contractual agreement done on a voluntary basis, and includes a purchase right for the commune. Current cantonal legislation does not regulate the matter; however, the current proposal foresees integration of three instruments into the cantonal law (art. 126a ff nBauG):

- contractual (public law) building agreement with a purchase right for the commune. For the reasons mentioned above, this instrument is almost exclusively dedicated to new zoning operations;
- conditional zoning in: if the zoned in land is not built within a defined time span, it is transferred back into the agricultural zone without compensation;
- imposed building obligation: in case of dominant (*überwiegend*) public interest (scarcity of available building land or central character of the plot), an obligation to build can be set by the communal executive as subsidiary measure when the plot remains undeveloped for at least five years. This obligation can be applied to newly zoned plots, or plots already zoned. It is recorded in the land registry. In order to implement this obligation, the commune:
  - can levy an incentive tax after having defined the necessary legal provisions in its building regulations and
  - is granted a right of expropriation as a last resort measure.

Compared to the current situation, the main change is that the commune has the option of introducing the incentive tax. The expropriation right functions as a threat that – at least in today's situation – is not exercised. However, as the incentive tax is voluntary, its effectiveness depends on, if and when the communes introduce it, and how much value the tax effectively captures. If a parallel is drawn with the implementation status of the communal tax on added land value created by zoning, its effectiveness might be very limited as communes might simply not implement it. Nevertheless, if one takes into consideration the excessive communal building zones and the subsequent limited communal margin of manoeuvre during building regulation revision, the implementation of the incentive tax might constitute a strong incentive for the communes themselves to increase conformity of land use to the zoning plan and thus be able to regain some planning autonomy. Furthermore, the implementation of a building obligation has also to take into consideration the current housing market, as the profitability of the new constructions would require detailed investigation.

4.5 Diversion of the tax on added land value created by zoning

The fifth finding concerns the use of the tax on added land value created by zoning. In Oberaargau, its application is limited to 18 communes out of 47 and the majority of these communes have introduced it during their last building regulations revision, that is to say less than ten years ago. It is not possible to find out how much money authorities cashed in through the tax on added land value created by zoning, but in practice, I found out that its implementation is subject to two main limits:

1. Some communes divert the funds gained from the tax on added land value created by zoning from public purposes[2] to finance land service. They use the legal argument and provisions of the tax on added land value created by zoning

[2] Art. 142 BauG, SR-BE 721.0.

together with those of the land service tax in order to ensure payment of land service by landowners. As both elements are part of the same contract, they are merged into one unique negotiation. Thus, the instrument cannot fulfil its aim to capture land value increase created by zoning, but merely ensures a higher pass on of land service costs on landowners. It redistributes the captured rent directly to the landowner. This mix of tools is due to the difficulty for the communal authorities to pass on land service costs to landowners (in the past, these costs were paid by public funds)[3].

2. Other communes bypass the implementation of the tax by lowering the effective taxed amount, or, in other words, they estimate agricultural land price higher and zoned in land price lower than market value and thus reduce the amount of tax levied in comparison to the contractually foreseen percentage. As a consequence, even with a taxation percentage written in the building regulations (*e.g.* 30%), the effective taxed amount remains part of the communal discretionary power.

No redistributive mechanism on regional level

Another difficulty of the current legal provisions is that the gains received by the commune through the tax on added land value created by zoning hinder any proper redistribution of value between a wider circle of landowners and territories, as its application perimeter is limited to communal borders.

Possible cantonal fund circumvents the problem

As the tax on added land value created by zoning is deducted from the real estate gains tax: a mandatory systematic tax in the form of a cantonal decision instead of a contract would result in an actual income loss for the canton. In fact, cantonal fiscal authorities have calculated (using the year 2012 as an example) a cantonal reduction of income through the real estate gains tax of approximately 10% (FIN, 2013). The new legal proposal (art. 142e nBauG) foresees a division of the gains of the tax on added land value created by zoning between commune and canton of respectively 70% and 30%. This should allow the creation of a cantonal compensation fund intended for funding, in cases of material expropriation, measures of land use planning (defined by art. 3 RPG), public infrastructure, archaeological sites, or even purchases of plots to develop housing or work sites in areas of cantonal importance (art. 142e nBauG).

Payment time of tax on added land value created by zoning is taken into consideration

Further, the legal proposal foresees that the tax payment by the landowner is due when the zoned in plot is constructed or sold (art. 142b nBauG), its perception depends on the building delay specified in the contract between the commune and the landowner. Nevertheless, an incentive to develop the land quickly is set by art. 142a nBauG, as the percentage of tax on added land value created by zoning increases with the number of years during which the concerned plot remains unsold or undeveloped.

Further economic value creation also taxed in current proposition

Moreover, the new legal proposal (art. 142a nBauG) includes a tax on added land value created by zoning for zoning up, excavation authorizations (*e.g.* gravel pits, wood cutting) and deposit areas (*e.g.* landfills), which is not mandatory according to federal law. Further, the payment is guaranteed by mortgages held by the canton and/or the commune (142d nBauG).

Percentage of tax payment should be unified

At last, the price calculation should now be unified and correspond to calculation methods (art. 142a BauG) used by the fiscal administration, as the tax on added land value created by zoning is now levied by the cantonal authority.

4.6 Calculation method of building zone as central issue

As the analysis of various building regulations revisions has shown, the calculation method for the correct dimensioning of the building zone is a central issue. Over the time period studied, calculation criteria have been unified and adapted to the new living habits of individuals. However, they do not lead to effective restriction of building zone needs.

With the new federal calculation method, a cantonal land use coefficient (the ratio between the sum of communal building zone capacities and demographic and jobs forecasts[4]) is used for determining future construction zoning needs. It is similar to

[3] M. Jampen and H.-J. Muralt *op. cit.*

[4] One job is considered to be equivalent in terms of surface as one inhabitant.

the Bernese calculation method in the sense that it relies on a median value of surface use per inhabitant, (which is in fact a density coefficient based on the socio-economic characteristics of the commune), as well as federal demographic prognostics. However, this technique creates the possibility for cross-communal and cross-cantonal comparison, which is supposed to provide incentives for cantonal and communal authorities to conform to legislation (Flückiger, 2014, 49). Based on the author's analysis (Flückiger, 2014, 90ff), the directives can be appraised as follows:

- only three types of zones are taken into account in the calculation of the correct building zone dimension[5], which excludes land consuming activities (economic development areas, tourist areas) from the calculus;
- the cantonal land use coefficient as sum of communal host capacities in the three different considered zones does not reflect the real size of building zones, nor the relevance of their location;
- a wide margin of manoeuvrability is left to the cantons, as no absolute limits in terms of surface or density are determined by federal law (*e.g.* minimum density coefficient). Only the median density of each category of communes[6] is used as a relative limit;
  - in this sense, the current Bernese calculation method is stricter, as it fixes an absolute minimum density coefficient (for example, one could have also taken the top quartile as a reference value);
  - no solution is provided for the problem of the location of building zones;
- the cantons are free to opt for optimistic demographic scenarios, leaving a wide margin of manoeuvrability when calculating the correct size of building zones;
  - as the case studies' analysis has shown, the use of a single cantonal growth scenario is also problematic, as it attributes equal zoning rights to communes with opposite demographic evolutions;
- the restriction of urban sprawl is limited to the reproduction of past urbanization patterns: low density communes will remain low density, whereas a densification process in the centres could be applied to most communes;
  - Still, urbanization limits, valid for 20 to 25 years, have yet to be defined in the cantonal or regional structure plan.

4.7 Communal creativity in order to solve land availability issues

The case studies' analysis has demonstrated a high level of communal creativity in attempting to solve land use planning and other land-related problems they face.This leads to the creation of strategies that realise, divert, or bypass land use planning goals:

- the green zone of Wiedlisbach is of particular interest, as it is used to divert the instrument of zoning. Through a zone change applied to plots in the building zone, the available surface for development has been temporarily reduced. Thus, these plots are not counted as reserve in the building zone calculus, which in turn allows for further building zone extensions;
- the emption right used for the extension of the building zone in the Gerzmatt in Wiedlisbach is an innovation in the current institutional regime of soil, because it substitutes the lack of building obligation with a contractual agreement to sell the land if specific conditions, such as development, are not met within a given time period;

[5]Nevertheless, these three zones account for 70% of all building zones and host 79% of all inhabitants and jobs.

[6]Categories defined by the typology of the communes used by the BFS

- the use of building rights by semi-public organisations in order to contribute to communal demographic objectives;
- the implementation of a tax on added land value created by zoning on an entirely voluntary basis in Niederbipp: the commune has successfully used the value capture mechanism, although the intended rate of 30% value tax is not as effectively implemented as it would be if effective land market prices had been used as a reference;
- on also acknowledges the extensive use of contracts between authorities and target groups in order to implement land use planning policy. Bernese legislation allowed, in particular for the tax on added land value created by zoning and land service tax, and the elaboration of private arrangements specific to each land use project that are in the centre of value redistribution issues.

4.8 Redistributive capacity of current institutional regime

Although the institutional regime of Oberaargau has innovative land use planning instruments (tax on added land value created by zoning, contractual arrangements), redistributive effects have been very limited until recently, due to:

1. Instruments that capture and redistribute value are optional, and the communes frequently do not implement them. Those communes implementing them still have an important margin of manoeuvrability (creation of specific zones, use of tax on added land value created by zoning for no foreseen ends);
2. Current Bernese tax on added land value created by zoning is quite different from the original (1976) and current (2013) conception in federal law; thus, it does not allow them to anticipate the potential effects of the revised federal law;
3. There is no obligation of construction, although land hoarding is a recurrent and quantitatively important issue;
4. In the cases where an implementation of the instrument occurred, it took place lately and as a reaction to already existing problems. However, authorities attempted to extend the redistributive capacity of the institutional regime after experiencing the negative consequences of spatial development dynamics;

For now, the question of redistributive instruments allowing the transfer of building rights from oversized areas to center regions, or close to transport infrastructure, is not covered by the new legislative proposal.

The question of the financial compensation in case of material expropriation is partly addressed by the new law, as it allows the communes with oversized building zones to rely on the probable creation of a cantonal compensation fund (art. 142e al. 4 nBauG). However, given the reluctance of communal authorities to use their legal resources to proceed to building zone reductions, along with the time gap between the extension of the building zone in the 1970s and the fund's creation in the 2010s, the actual use of the fund's money to compensate material expropriation remains open.

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Appendix

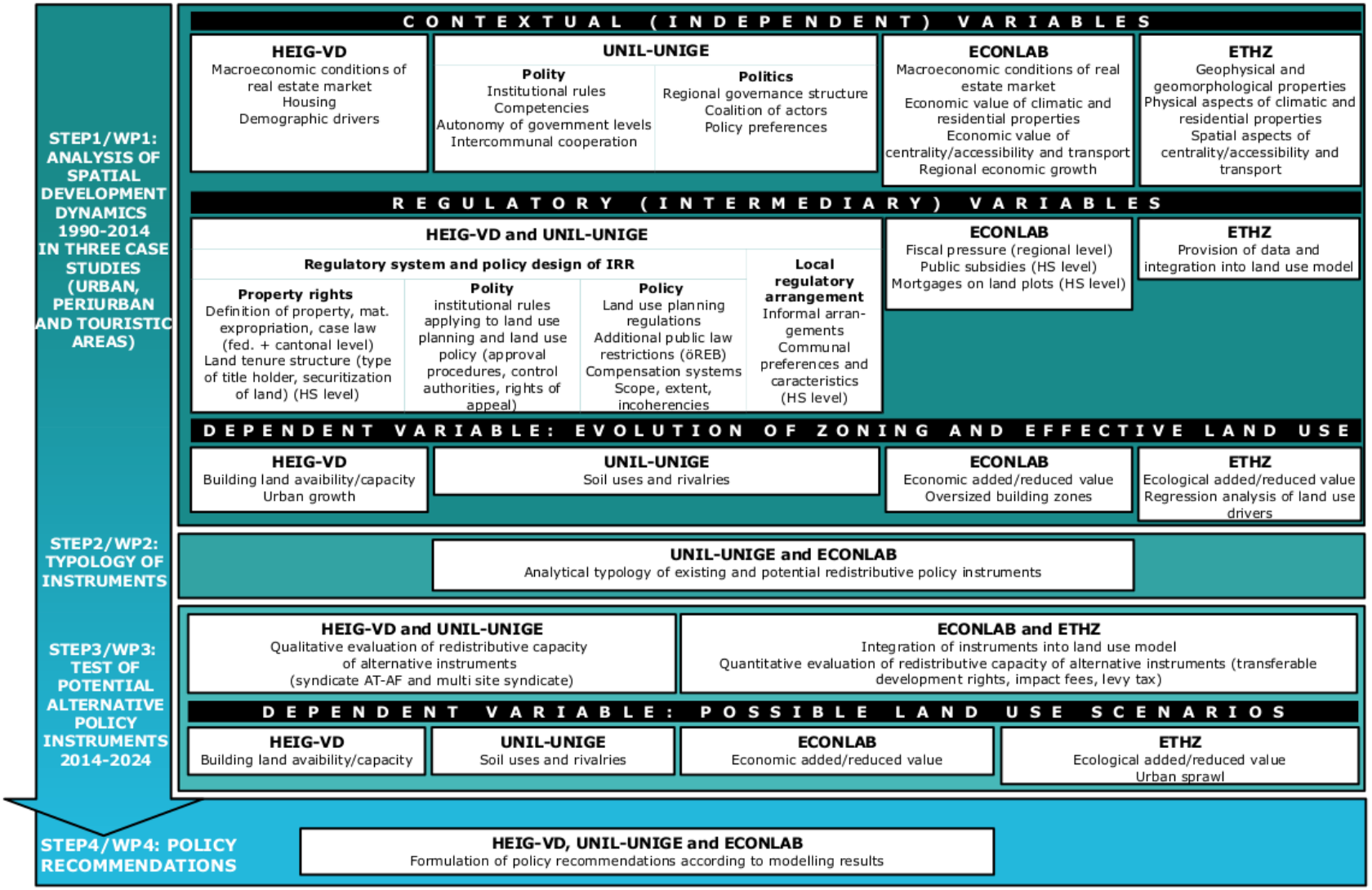

Figure 4.1: SUMSOR Project design