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ANNEX

7 Activity Report of the Spatial Planning and Sustainable Development Working Group for the period 2023-2024

**ACTIVITY REPORT OF THE
Working Group Spatial Planning and Sustainable Development
FOR THE PERIOD 2023-2024
(BETWEEN THE XVII AND XVIII MEETINGS OF THE ALPINE CONFERENCE)**

1. Overview of the mandate given by the XVII Alpine Conference

Summary of the objectives according to the 2023-2024 mandate

- Improvement of cross-border cooperation in spatial development in the AC: Based on the results of the assessment study on cross-border cooperation conducted in the previous mandate, ways to optimize cross-border cooperation in spatial planning and development will be further explored and concretised. The focus will be on needs for and obstacles impeding necessary cross-border cooperation. This may include the preparation of a project proposal for transnational or bi-national funding programmes (e.g. Interreg).
- Follow up to the ACTS 2050 and the implementation pathways Contributing to the Alpine Climate Board (ACB) implementation pathways on Spatial Planning (IP_SP1: Alpine wide concept “Spatial planning for climate protection” as well as IP_SP2: “Spatial planning measures for reducing the need of individual car traffic”) and further activities for teaming up as started on soil protection.
- Alpine Spatial Planning Perspective: The insights of processes such as the Alpine Convention, the Alpine Space Programme, EUSALP, RSA 9, ESPON Alps2050 and EUSALP Joint Paper on Spatial Planning processes shall be brought together, and work towards an alignment of objectives shall be started. This will happen through the combination and alignment of spatial development proposals in a cartographic and topic-oriented manner, including participatory steps from the involved domestic and Alpine institutions, to come, in the end, to a consolidated version on the transnational level. Additionally, following up on recommendations of the Alpine Convention’s report on Economical Use of Soil and the respective report of the Compliance Committee, a practice-oriented implementation guideline for the Spatial Planning and Sustainable Development Protocol shall be elaborated. This guideline will address the target group of regional and municipal planning authorities and decision makers. Existing implementation guidelines will be taken into account and updated.

2. Meetings

Summary of the meetings held (date, place, main topics and milestones)

- 16 March 2023 (online): Working Group Meeting: Mandate tasks, Slovenian Presidency, Exchange with other WGs
- 22 September 2023 (Paris): Working Group Meeting: Status of mandate tasks, exchange with WG Transport
- 23 September 2023 (Paris): Joint meeting with Transport WG: Common issues and workshop on Alpine Spatial Development Perspective

- 16 October 2023 (online): Preparatory workshop for joint national workshops Soil Protection / Spatial Planning
- 23 February 2024 (online): Working Group Meeting: Status of mandate tasks / joint national workshops Soil Protection / Spatial Planning / Exchange with other WGs / Outlook on next mandate
- 22 May 2024 (online): Joint meeting RSA 10 WG / Spatial Planning and Sustainable Development WG: Discussion of the RSA 10 draft on “Quality of Life” and its spatial implications
- 16-17 July 2024 (Innsbruck): Working Group Meeting: Finalisation of mandate tasks / Workshop on Alpine Spatial Development Perspective / Cooperation with EUSALP / Exchange with other WGs / Outlook on next mandate and beyond
- 16 September 2024 (online): Working Group Meeting: Last revision and finalisation of all mandate outputs and future mandate proposal

3. Activities carried out

Activities carried out with their outputs and results, highlighting their contributions to the relevant priorities of the [Multi-Annual Work Programme 2023-2030](#)

- Preparation of a project proposal: Coordination and elaboration of an application for the [ESPON Targeted Analysis InTerAlp](#) (Interface Territories across the Alpine region). The proposal was accepted by ESPON and the InTerAlp project started with a kick-off on 11 January 2024. InTerAlp contributes to all MAP 2023-2030 Priority Areas, but most specifically to Priority Area 3 “Enabling a good quality of life for the people in the Alps” by addressing governance issues for interface territories situated between the mountain areas and neighbouring lowland regions. In addition to regular reporting of the project consortium about the progress, the WG members were invited to participate in an online workshop (30 September 2024) and a follow-up survey to help refine the recommendations of the policy brief (project output).
- Contributions to the Alpine Climate Target System 2050 (Climate Action Plan 2.0), contributing to the MAP 2023-2030 Priority Area 2 “Taking ambitious climate action”
 - For IP_SP1_Step 1a, a screening of national climate scenarios and their implications for spatial planning and development, as well as a scoping review on the interlinkage between spatial planning and climate change in the Alps were carried out.
 - For IP_SP1_3, in the previous mandate literature on challenges for land-saving targets was researched and screened for all Alpine countries. In a second step during this mandate, 13 experts were identified and interviewed in the form of guided interviews on their perception of challenges, achievements and next steps in regard to land-saving targets.
 - For IP_SP1_4, a total of 74 guidelines and documents were researched, analysed and their key contents were summarised in the form of individual factsheets.
- Steps were taken toward an Alpine Spatial Development Perspective by addressing different thematic issues with academic input and participatory elements:
 - Linking spatial development and transport
 - Linking spatial development and green infrastructure
 - Linking economic and spatial development

- National joint workshops between Soil Protection and Spatial Planning stakeholders, coordinated by national representatives from the Soil Protection WG and the Spatial Planning and Sustainable Development WG:
 - Slovenian workshop held on 17 January 2024 (50 participants)
 - Austrian online-workshop held on 18 April 2024 (65 participants)
 - French workshop held on 23 May 2024 (20 participants)
 - German workshop held on 1-2 July 2024 (25 participants)

The national workshops and the initiative as a whole contribute to MAP Priority Area 1 “Conserving and valuing biodiversity and ecosystems”. The cross-sectoral contacts established through the joint workshops are in line with the MAP 2023-2030’s cross-sectoral approach.

4. Cooperation

Cooperation developed with other Alpine Convention bodies and further relevant partners and processes, and resulting benefits

- 16 October 2023: Joint workshop with Soil Protection WG preparing the national joint workshops Soil Protection / Spatial Planning
- 23 September 2023 (Paris): Joint meeting with Transport WG
- 4 December 2023 (Rome/online): Joint Thematic Workshop with Alpine Biodiversity Board and Soil Protection WG on “Biodiversity and Land-Use Planning”
- 14 May 2024 (Maribor) Workshop of the Thematic Working Body Chairs: Participation of Dr. Josiane Meier
- 26 June 2024: Online exchange between WG chair (incl. consultants) and Michael Roth on interfaces between the Alpine Spatial Development Perspective and EUSALP in the light of the upcoming Austrian and Liechtenstein EUSALP Presidency 2025
- 2023/2024: Contributions to the RSA 10 drafting process in the form of written comments and participation in RSA 10 WG meetings, including a joint meeting of both WGs

5. Communication

Communication measures and outreach activities carried out, specifying their respective target groups

- 9 March 2023: Participation in the BBSR Online-Workshop “Implementation of the Territorial Agenda 2030”, presenting the Pilot Action Sonthofen (related to the RSA 9 process in the context of the previous mandate)
- 2023: Article “Soil Protection and Spatial Planning” in: Die Alpenkonvention No. 104, 03/23 (Authors: Dr. Daniel Meltzian, Christian Steiner, Florian Lintzmeyer)
- 2024: Article “Visionen zwischenstaatlicher Zusammenarbeit” in: Raumentwicklung – ARL-Journal für Wissenschaft und Praxis“. 01/2024. (Author: Dr. Daniel Meltzian)

6. Attachments

List of the documents attached to this report, such as papers proposed for approval by the XVIII Alpine Conference (thematic reports, guidelines, statements etc.) and supporting documents (workshop proceedings, survey reports, communication materials etc.).

- Alpine Climate Target System 2050 and Climate Action Plan 2.0:
 - Climate Scenarios in Alpine Countries and Indications for Spatial Planning. Contribution to IP_SP1_Step 1a of the Climate Action Plan 2.0
 - Climate Scenarios: Linking Climate Change and Spatial Planning. Contribution to IP_SP1_Step 1a of the Climate Action Plan 2.0
 - Land saving targets in Alpine countries: Status quo and challenges. Contribution to IP_SP1_3 of the Climate Action Plan 2.0
 - Guidelines for municipalities for assessing and activating innerurban development potentials. Contribution to IP_SP1_Step 4 of the Climate Action Plan 2.0
- Alpine Spatial Development Perspective: Synthesis Report
- Promoting soil protection through spatial planning in the Alpine states – National Workshops. Joint report of the Working Groups Soil Protection and Spatial Planning and Sustainable Development of the Alpine Convention

Climate Scenarios in Alpine Countries and Indicators for Spatial Planning

***Contribution to IP_SP1_Step 1a
of the Climate Action Plan 2.0***

**Spatial Planning and Sustainable Development Working Group
of the Alpine Convention**

Mandate 2023-2024



ALPENKONVENTION
CONVENTION ALPINE
ALPSKA KONVENCIJA
CONVENZIONE DELLE ALPI

IMPRINT

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Executive Summary

Background

The Alpine Climate Action Plan 2.0 foresees as Step 1a of its Implementation Pathway Spatial Planning the definition and provision of data concerning the impact of climate scenarios on land use.

The Spatial Planning and Sustainable Development Working Group (SPSD WG) decided that the provision of data on the impact of climate scenarios on land use requires a level of detail and planning-specificity that was not reflected in the climate scenarios in the Alpine countries and states. Therefore, the SPSD WG reformulated the mandate task to elaborate a synopsis of climate scenarios that are the basis for climate and climate-related policies of Alpine countries and Federal States/Provinces/Regions. The main benefit of this report is to provide a current overview of climate scenarios adopted in the Alpine countries and their key predictions of future developments of climate parameters in the Alps. The report concludes by identifying present and future spatial challenges arising from these scenarios for the Alpine region. Future follow-up steps can further concretise the interface between changing climate conditions in the Alps and responses in the field of spatial planning.

Regional Climate Projections for the Alps

Regional climate downscaling is needed to provide higher-resolution climate information than is available directly from contemporary global climate models. The regional climate projections used in the Alpine countries are based on the EURO-CORDEX (European Domain of the Coordinated Downscaling Experiment) or (for Italy) on the MED-Cordex (Mediterranean CORDEX).

Temperature: Expected increases in temperature are significant across all Alpine subregions (NW, NE, S), with more pronounced warming in winter and varied increases in summer. Extreme weather events, including heatwaves, are anticipated to become more frequent.

Precipitation: Annual precipitation totals are expected to remain relatively stable, but there will be increases in winter and decreases in summer. Variability in precipitation patterns will depend on emission scenarios, with extreme weather events like heavy rainfall becoming more frequent.

Representative Concentration Pathways (RCPs): Different scenarios project varying degrees of warming and emission impacts. For instance, RCP2.6 aims to limit warming to below 2°C, while RCP8.5 represents a worst-case scenario with continued high emissions.

Country-Specific Climate Scenarios

- **Austria:** The scenario dates from 2015. It is based on the reference period 1971-2000, shows projections for different time periods in the current century and for different RCPs. All projections anticipate a rise of annual mean temperature, a significant winter warming, increases in heat and summer days and a significant decrease of frost and ice days. Change in annual precipitation total under RCP4.5 is only sporadically, under RCP8.5 precipitation increases by 8.7% on average. Changes in precipitation amount are more pronounced in the highlands. The statements on precipitation are generally

less reliable because they show a high spatial and temporal variability; the statements on temperatures are more reliable.

- **France:** The scenario is based on the reference period 1976-2005. It shows projections for different time periods in the current century and for different RCPs. It predicts more hot days and heatwaves, which is more pronounced in the Alps and Pyrenees. The decrease in frost days will also be greater in the coldest regions, such as the Alps. Precipitation shows a systematic increase in winter and a decrease in summer, as well as an increase in droughts.
- **Germany/Bavaria:** The scenario dates from 2020. It is based on the reference period 1971-2000. It shows projections for different time periods in the current century and for different RCPs. It predicts an increase of heat days, milder winters and increased heavy rainfall, especially in summer. At the same time dry summers are expected to increase. But the statements on precipitation are generally less reliable than the statements on temperatures.
- **Italy:** The scenario shows projections for three different time periods in the current century and for different RCPs. It predicts an increase of annual mean temperatures at for all RCPs and time periods. It projects varied precipitation trends with some models showing decreases and others increases.
- **Liechtenstein:** The projections are based on Swiss climate scenarios CH2018. The reference period is 1981-2010. It shows projections for three future 30-year periods and for two RCPs. It predicts fewer frost days in all altitude levels, more frequent heatwaves, increased summer droughts, and an increase of heavy precipitation events at all seasons, but especially in winter.
- **Slovenia:** The scenario is based on the reference period 1981-2010. It shows projections for two future 30-year periods in the current century and for three different RCPs. It foresees significant temperature increases for all seasons an increase of heat load, while the frequency of spring frosts will remain at similar level to the reference period. Annual and winter precipitation will increase, but the patterns differ regionally. Intensity and frequency of extreme precipitation events will increase. the direction and magnitude of the change in precipitation depends strongly on the emissions scenario and partly on the model.
- **Switzerland:** The simulations are based on Swiss climate scenarios CH2018 with a total of 21 different models. The reference period is 1981-2010, it represents two reduction pathways. The climate scenarios are currently being revised in the "Climate CH2025" project. Key messages are, that ground level air temperature will increase more in Switzerland than in the global mean, summers will be drier and hotter, winters will be milder, but with an increase of precipitation. At the same time snow days will decrease, as the 0°C limit in winter will rise to higher altitudes. Heavy rain events will become more frequent and intense. But statements on precipitation are generally less reliable, than on temperature.

Scenario-based indications for spatially relevant challenges

In order to assess the necessary adaptation measures the climate scenarios have to be adapted to a "spatial" language. This requires involvement of specific experts who could use climate scenario data to define potential impacts in the space. This could not be achieved

within the scope of this implementation pathway. Therefore, only the fields of action for spatial planning and interfaces with sectoral planning are briefly addressed here.

- **Natural hazards:** Increased risks from changing temperatures and precipitation patterns will require better management of vulnerable areas and restrictions on development in high-risk zones.
- **Regional/Urban planning and cross-sectoral integration:** The spatial impacts of climate change require cross-sectoral integration of adaptation and mitigation strategies. In urban areas, it is particularly important to protect cold air production areas and fresh air corridors.
- **Energy production and supply:** The Alps are a major producer of hydroelectricity, and changes in precipitation also mean changes in runoff and thus have an impact on hydroelectric power generation. The demand for reservoirs may increase in this context. But also other renewable power plants, biomass plants, windmills and even photovoltaic plants (except on existing roofs) have interfaces with spatial planning.
- **Water management:** Changes in water availability will have an impact on various sectors, not only in the Alps but also in the foothills, necessitating new reservoirs and a larger peri-alpine area. Water management needs to adapt to climate change and there is a need for an intensive exchange with spatial planning.
- **Tourism:** Climate change is affecting the tourism sector. Not only winter tourism and ski infrastructure are affected, but also year-round tourism, visitor management and cross-border coordination.

1. BACKGROUND

The Alpine Climate Action Plan 2.0 foresees as Step 1a of its Implementation Pathway Spatial Planning the definition and provision of data concerning the impact of climate scenarios on land use (Permanent Secretariat of the Alpine Convention 2021:115):

“Statistical data on land-consumption and Net0 based on a municipal level shall be harmonised across the Alps. Further, data on the impact of climate scenarios (precipitation, temperatures) on the land use shall be provided where they have a cross-border relevance, e.g. the impacts on cross-border infrastructure, energy production, settlement development.”

The Working Group Spatial Planning and Sustainable Development included this task in its 2023-2024 mandate in the form of following up the Alpine Climate Target System 2050 with the planned output of “Definition and provision of data concerning the impact of climate scenarios on land use”. In the course of operationalising this mandate task, the Working Group concluded that the above-mentioned provision of data on the impact of climate scenarios on land use requires a level of detail and planning-specificity that was not reflected in the climate scenarios in the Alpine countries and states. Therefore, the Working Group reformulated the mandate task to elaborate a synopsis of climate scenarios that are the basis for climate and climate-related policies of Alpine countries and Federal States/Provinces/Regions. The main benefit of this report is to provide a current overview of climate scenarios adopted in the Alpine countries and their key predictions of future developments of climate parameters in the Alps.

Consequently, this report presents the results of an Alpine-wide screening of officially adopted climate scenarios, their underlying methodology and key findings for the respective Alpine countries, including selected regions. The report concludes by identifying present and future spatial challenges arising from these scenarios for the Alpine region. Future follow-up steps can further concretise the interface between changing climate conditions in the Alps and responses in the field of spatial planning.

The scenarios do not include statements on their impacts on spatial planning, cross-border infrastructure, energy production and settlement development. These are rather addressed in regional and national adaptation plans.

2. CLIMATE PROJECTION FOR THE ALPS

Regional climate downscaling (RCD) is needed to provide higher-resolution climate information than is available directly from contemporary global climate models. The regional climate projections used in the Alpine countries are based on the EURO-CORDEX¹ - the European Domain of the Coordinated Downscaling Experiment – or for Italy on the MED-Cordex². Both are internationally coordinated frameworks to produce improved regional climate change projections. The regional climate scenarios represent the expected changes in

¹ Coordinated Regional Climate Downscaling Experiment (CORDEX) is a framework of the World Climate Research Program (WCRP) to evaluate regional climate model performance through a set of experiments aiming at producing regional climate projections. CORDEX is split in so-called domains, which represent a section from the earth's surface. The Alps are represented fully in the EURO-Cordex and in the Med-CORDEX. <https://www.euro-cordex.net/>

² <https://www.medcordex.eu>

various climatic parameters, such as average temperatures, number of hot or frosty days or precipitation totals.

The publication “21st Century alpine climate change” (Kotlarski et al. 2022) presents a comprehensive assessment of climate change projections for the Alps, based on the CORDEX regional climate model ensemble. The Alps are divided into three subregions (see Figure 1) for spatially averaged analyses:

- Alps NW (north-west): western part of the region north of the Alpine main ridge; characterised by a strong oceanic influence with two annual precipitation peaks.
- Alps NE (north-east): eastern part of the region north of the Alpine main ridge; characterised by continental influence with largest precipitation amounts due to convective activity during summer.
- Alps S (south): all regions south of the main ridge, characterised by a strong Mediterranean influence.

Analysis regions

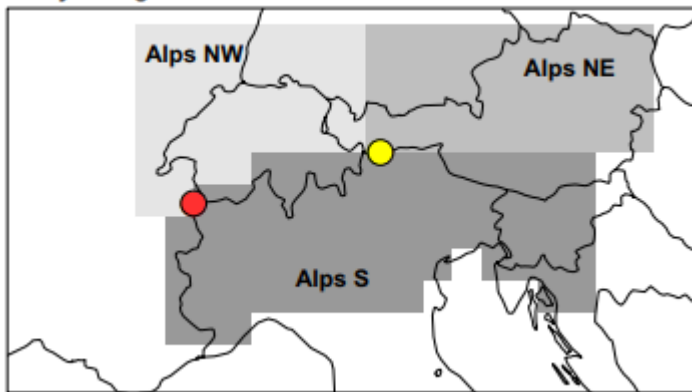


Figure 1: Subregions in regional climate models (coloured dots are locations of dedicated snow cover analysis, yellow: Ötztal Alps, red Mont-Blanc massif; Source Kotlarski et. al. 2022, p. 70)

Temperature

From: 21st Century alpine climate change

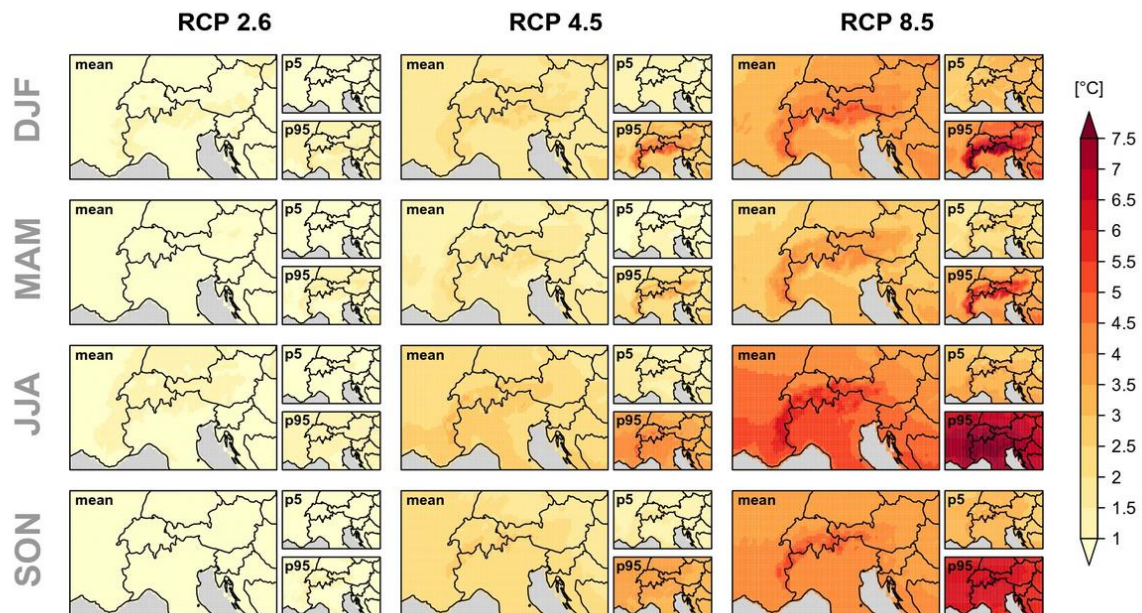


Figure 2: Projected seasonal mean temperature change between 1981-2010 and 2070-2099. The columns show three different emission scenarios RCP³, the rows the different seasons: DJF: December, January, February; MAJ March, April, June; JJA: June, July, August; SON: September, October, November. (Source: Kotlarski et al. 2022, p. 71)

Figure 2 shows the projected seasonal mean temperature change between 1981-2010 and 2070-2099. For each season and RCP, the larger map shows the mean value of the different models, the smaller ones show the model uncertainty range represented by the 5th (q5) and 95th (q95) percentile. The maps indicate a spatial variability of future warming in the Alps. It shows an elevated summer warming in the southern parts of the domain and an amplified warming along the main Alpine ridge, in particular for the higher emission scenarios RCP 4.5 and RCP 8.5. (Kotlarski et al. 2022).

Precipitation

While the projections show a clear change in mean temperature, the EURO-CORDEX climate projections indicate only minor changes in mean annual precipitation sums for all emission scenarios. But on a seasonal scale, trends become apparent from about mid-century. *“Characteristic patterns are an increase in wintertime and a decrease in summertime precipitation amounts, with the strengths of these signals scaling with the considered emission scenario. The opposing characteristics of changes in winter and summer precipitation amounts compensate each other at the annual scale, such that overall annual precipitation amounts show no clear signal.”* (Kotlarski et al. 2022, p. 72)

³ RCP: Representative Concentration Pathways. The RCPs represent different development paths of the concentrations of greenhouse gases, aerosols and associated emissions. The RCPs are differentiated by their radiative forcing at the end of the 21st century.

From: 21st Century alpine climate change

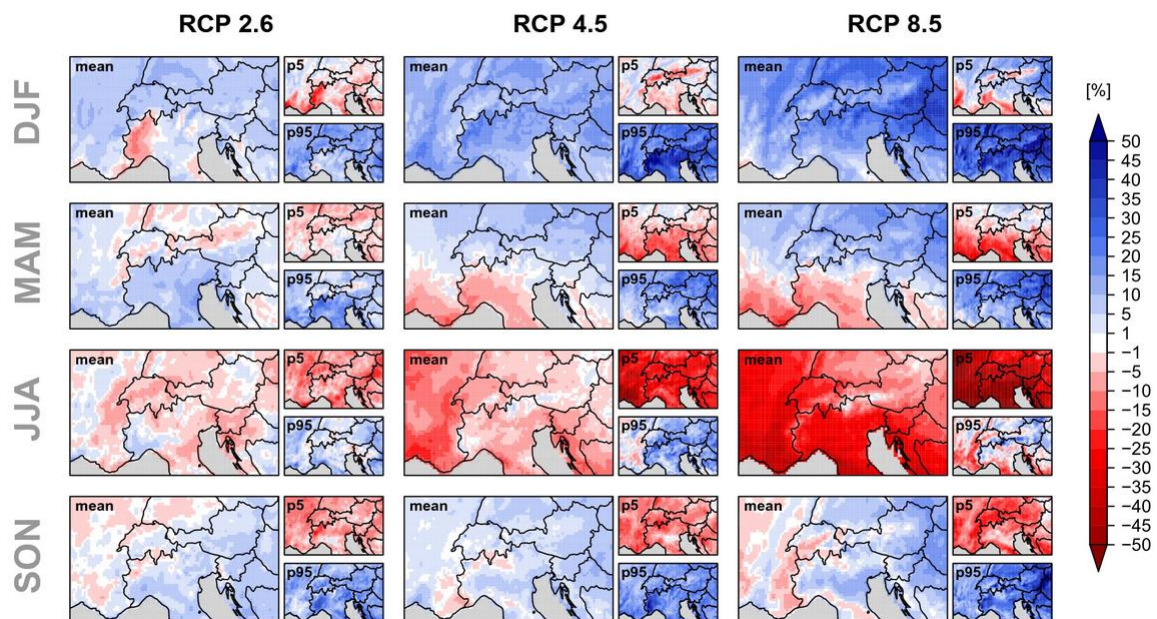


Figure 3: Horizontal pattern of the projected seasonal mean precipitation change [%] between 1981–2010 and 2070–2099 over the Alpine domain and for the three emission scenarios considered. Columns refer to the individual emission scenarios and lines to the seasons (Source: Kotlarski et al. 2022, p. 74)

Except for RCP 2.6, increases in wintertime mean precipitation are projected for the entire Alpine region. “*Vice versa, summer precipitation decreases become apparent for most parts of the Alpine domain in the ensemble mean and especially for the lower estimate (p5). In contrast, the upper change estimate (p95) indicates the possibility for an increase of summer precipitation for large parts of the domain and especially for emission scenarios RCP 2.6 and 4.5. In the transition seasons spring and autumn lower change estimates are mostly negative and upper estimates positive with ensemble mean changes being either positive or negative depending on the specific region and the emission scenario considered.*” (Kotlarski et al. 2022, p. 74)

What are a Representative Concentration Pathways (RCP)?

The latest generation of climate projections for the 21st century, “*RCPs are defined by different radiative forcing levels at the end of the 21st century. The related temporal evolution of atmospheric greenhouse gas and aerosol concentrations (in some cases emissions) are prescribed in global climate models, which then simulate the response of the climate system to the forcing. By prescribing different forcings according to different pathways, a range of potential future climate evolutions can be projected. A subset of currently four RCPs are used to create a multi-scenario ensemble to cover a build on Representative Concentration Pathways.*”⁴

- RCP2.6: Very ambitious measures to reduce greenhouse gas emissions needed. It leads to a radiative forcing of around 3 W per m² by 2040 and then falls to a value of

⁴ EURO-CORDEX Guidelines Version 1.1 - 2021.02 https://www.euro-cordex.net/imperia/md/content/csc/cordex/guidance_for_euro-cordex_climate_projections_data_use_2021-02_1_.pdf

2.6 W per m² by the end of the 21st century. Currently, emission data do not suggest that such a decline is imminent, with global emissions having reached an all-time high of 36.8 Gt in 2022 (International Energy Agency 2024), bouncing back from a small Covid-19-related decline. The RCP 2.6 requires negative emissions (i.e. CO₂ absorption) to a significant extent, i.e. CO₂ emissions will be reduced by more than 100% to around -1 GtC annually in 2100. Respective measures include considerable improvements of energy efficiency, replacement of unabated use of fossil fuels by a combination of fossil-fuel use with carbon capture and storage, renewable energy and nuclear power as well as the use of bioenergy with carbon capture and storage (BECCS) (von Vuuren et al. 2011:103). BECCS will decrease emissions in the power sector but increase land-use related CO₂ emissions attributed to land use for bioenergy production, reducing the uptake of CO₂ by lower shares of forest re-growth.

RCP2.6 is the only scenario that will likely keep global warming below 2°C. Compared to a baseline scenario, the RCP2.6 assumes an increase in land use for bioenergy as an effect of climate policies, resulting in slightly higher CO₂ emissions from land use (ibid:105).

For methane and nitrous oxide, emissions are expected to be reduced to a smaller extent than for CO₂ as the abatement potential for important sources is limited such as ruminant livestock (cattle, sheep, goat) and N₂O emissions from soils as a consequence of agricultural use (animal waste and fertilizer).

- RCP 3.4: A less stringent, intermediate scenario, requiring significant CO₂-removal from the atmosphere and assumed to be one of the most plausible scenarios, effecting a temperature rise of 2-2.4°C by 2100.
- RCP4.5 and RCP6.0: Two intermediate stabilisation pathways in which radiative forcing is stabilised at approximately 4.5 W per m² and 6.0 W per m² after 2100. The RCP4.5 scenario will result in a temperature rise between 2 and 3°C by 2100 and constitutes a threshold beyond which many plant and animal species are unable to adapt.
- RCP8.5: “Business as usual” resp. worst-case scenario, describing a continuous increase in greenhouse gas emissions throughout the century that reaches a radiative forcing of 8.5 W per m² by the end of the 21st century. It is based on current and stated climate policies.

Table 1: Overview over climate projections used by Alpine countries

Country	Based on	Representative Concentration Pathways	Reference period	Time scales
Austria	EURO-CORDEX	RCP4.5, RCP8.5	1971-2000	Near future 2021-2050 Far future 2071-2100
France ⁵	EURO-CORDEX	RCP2.6; RCP4.5; RCP8.5	1976-2005	Near future 2021-2050 Middle future 2041-2070 Far future 2071-2100

⁵ The French climate scenario outlined below also covers the territory of the Principality of Monaco, which has not elaborated an individual climate scenario (see <https://www.gouv.mc/Action-Gouvernementale/L-Environnement/Le-Plan-Energie-Climat-dans-la-cite> and Direction de l'Environnement de Monaco (2020)).

(Germany) Bavaria	EURO-CORDEX; ReKliEs-De	RCP2.6; RCP8.5	1971-2000	Near future 2021-2050 Middle future 2041-2070 Far future 2071-2100
Italy	MED-CORDEX	RCP4.5, RCP8.5	1971-2000	Near future 2021-2050 Middle future 2041-2070 Far future 2061-2090
Slovenia	EURO-CORDEX	RCP2.6; RCP4.5; RCP8.5	1981-2010	Near future 2011-2040 Mid-century 2041-2070
Switzerland Liechtenstein	EURO-CORDEX	RCP2.6; RCP4.5; RCP8.5	1981-2010	Near future 2021-2049 Middle future 2045-2074 Far future 2070-2099

Until the end of 2020, the most current and widely used standard reference period for calculating climate normals was the 30-year period 1981-2010. After 2020, the World Meteorological Organisation WMO recommends calculating reference normals for the most recent 30-year average available. As outlined in Table 1, the most recent reference periods of 1981-2010 were used by Slovenia and Switzerland/Liechtenstein. The differences in reference periods can thus be attributed to the drafting period of the respective scenario.

Table 1 shows the differences and similarities of climate projection approaches adopted by Alpine countries. All alpine countries base their national climate scenarios on EURO-CORDEX, except Italy which uses MED-CORDEX. In Germany EURO-CORDEX is supplemented by selected further simulations (ReKliEs-De⁶). Differences relate to the reduction paths selected for the scenarios, the reference periods and the forecast periods.

3. CLIMATE SCENARIOS IN ALPINE COUNTRIES AND FEDERAL STATES/REGIONS

Austria

The current Austrian Climate Scenarios date from 2015 (ÖKS15) and are based on Euro-CORDEX data sets. Together with the analyses derived from them, the ÖKS15 provide an overview of the effects of climate change in Austria and form a basis for further detailed studies and adaptation strategies. In addition, there are fact sheets for each individual federal state in which the changes are summarised. For the projections an ensemble of 13 models was used.

As part of the ClimateScenarios.AT initiative, the new Austrian reference climate scenarios ÖKS26+ will be produced by 2026.

⁶ Regionale Klimaprojektionen Ensemble für Deutschland

Table 2: Climate Scenarios Austria (BMLFUW o.d. a)

Reference period 1971-2000	Near future 2021-2050		Far future 2071-2100	
	Scenario RCP 8.5: Business as usual	Climate protection- Scenario RCP4.5	Scenario RCP 8.5: Business as usual	Climate protection- Scenario RCP4.5
Temperature				
annual mean	+1.4°C	+1.3°C	+4.0°C	+2.3°C
heat and summer days	+10	+4	+17,4	+7
Vegetation period	+20 days		+61 days	+32.7 days
Frost days	-24.5 days	-20.5 days	-70 days	-41.5 days
Precipitation*				
Total annual precipitation			+8.7%	

* For Austria as a whole, significant changes in annual precipitation are expected only in the distant future and only in isolated cases (RCP4.5) or in somewhat larger contiguous areas (RCP8.5).

Additional key messages

- Temperature increases strongest in winter, weakest in spring.
- Increase in heat and summer days (daily maximum temperature above 30°C and 25°C, respectively), with a smaller increase in the Alps than in the rest of the country.
- Lengthening of the growing season, particularly evident in the main Alpine ridge and the foothills of the Alps.
- Frost and ice days (daily minimum temperature below 0°C and daily maximum temperature below 0°C, respectively) decrease significantly, much more under scenario RCP8.5 than under RCP4.5, the decrease is more pronounced at high altitudes.
- Change in annual precipitation total under RCP4.5 only sporadically, under RCP8.5 precipitation increases by 8.7% on average.
- Changes in precipitation amount are more pronounced in the highlands.
- Significant change in seasonal comparison of precipitation amount, only under RCP8.5 → increase of 30% on average in winter and 18% in spring, hardly any changes in summer and autumn.
- Only under RCP8.5 precipitation decreases significantly in some regions towards the end of the century.
- The climate scenarios do not show interpretable changes for dry and precipitation episodes for Austria.
- The climate changes are somewhat twice as pronounced in the RCP8.5 scenario than in the RCP4.5 scenario.
- The statements on precipitation are generally less reliable because they show a high spatial and temporal variability; the statements on temperatures are more reliable.

France

The current French Climate Scenarios date from 2020 (DRIAS) and are based on EURO-CORDEX data sets. Thirty regionalised simulations from the EURO-CORDEX ensemble covering the three climate scenarios RCP2.6, RCP4.5 and RCP8.5 have been selected to form an ensemble that is easier to use for impact studies than the full ensemble, which comprises

several hundred simulations. These climate scenarios were created for mainland France, including the islands off its coast in the Atlantic, the English Channel and the Mediterranean (France métropolitaine). Regional differentiations, e.g. for the French Alps, can be concluded from individual maps for single scenarios, but are not summarised specifically. The French overseas territories (France d'outre-mer) are not included here. In addition to the figures, the DRIAS 2020 report excerpt illustrated in Table 3 also contains cartographic representations that show regional differences. Table 3 shows some indicators from the DRIAS 2020 report (Meteo France n.d.).

Additional key messages

- Increase in the number of hot days and heat waves, but their predicted intensity depends strongly on the RCP and the time horizon.
- Warming is more pronounced in the mountains: the Alps and Pyrenees in particular
- Mild winters, decrease in cold extremes.
- The decrease of frost days is greater in the coldest regions (eastern France and mountain areas).
- Increase in droughts. Expected changes in the duration of meteorological drought episodes are highly dependent on the scenario and time horizon considered.
- Precipitation shows a systematic increase in winter and an almost systematic decrease in summer.
- Increase in heavy rainfall events, but with large regional variability. It should be noted that the main uncertainty in the evolution of this parameter has more to do with climate models than with the choice of RCP scenario considered.

Table 3: Climate Scenarios France (Meteo France n.d.)

Reference period 1976-2005	Near future 2021-2050 (H1)			Middle future 2041-2070 (H2)			Far future 2071-2100 (H3)		
Scenario	RCP2.6	RCP4.5	RCP8.5	RCP2.6	RCP4.5	RCP8.5	RCP2.6	RCP4.5	RCP8.5
Temperature									
annual mean C50 [C5; C95]*	+1.0°C [+0.7°C; +1.4°C]	+1.2°C [+0.7°C; +1.6°C]	+1.3 °C [+0.9°C; +1.9°C]	+1.2°C [+0.8°C; +1.5°C]	+1.7°C [+0.9°C; +2.3°C]	+2.2°C [+1.8°C; +2.9°C]	+1.0°C [+0.6°C; +1.4°C]	+2.1°C [+1.6°C; +2.7°C]	+3.9°C [+3.2°C; +4.9°C]
heat waves**							factor 2	factor 3-4	factor 5-10
frost days							-10 to 15 days		
Precipitation									
annual	+4.8% [-1.6; +7.9]	+2.8% [-1.4; +6.4]	+2.2% [-2.2; +7.7]	+6.2% [+1.1; +8.5]	+1.6% [-3.3; +7.8]	+3.4% [-2.0; +10.2]	+6.5% [+3.5; +9.3]	+2.9% [-0.8; +10.9]	+1.8% [-6.4; +15.1]

* The 5th percentile (**C5**) is the threshold value for which 95% of the values in the distribution are higher (the probability of exceeding the 5th percentile is 95%). The median (**C50**) is the threshold value for which 50% of the values in the distribution are higher (the probability of exceeding the median is 50%). The 95th percentile (**C95**) is the threshold value for which 5% of the values in the distribution are higher (the probability of exceeding the 95th percentile is 5%).

**Abnormally hot period lasting more than 5 days consecutive days. Abnormally hot are days on which the maximum daily temperature exceeds a climatological reference value by more than 5°C.

Germany / Bavaria

For Germany the Fact sheets from the Bavarian Environment Agency (LfU 2021) are presented in the following. Regional climate projection data from the EURO-CORDEX project and the ReKliEs-De project with a resolution of 12.5 km is used to create the climate fact sheets.

From the large number of different climate models, which are all based on the same basic physical equations but differ in the details, only climate models that can depict the spatial and seasonal dynamics of the climate in Bavaria in the reference period 1971-2000 were included in the Bavarian ensemble.

As the climate in Bavaria varies greatly from region to region, seven climate regions were identified for the climate fact sheets, which have climatic conditions that are as similar as possible. The classification was based on the measured values for the reference period 1971-2000. Some characteristic data for the Bavarian Alpine region are shown in Table 4. In addition, the models provide further climatic parameters that are more meaningful for some specific applications. These include, for example, parameters for water management (e.g. number of heavy rainfall days, winter precipitation), agriculture (e.g. number of frost days, precipitation in the vegetation period) and health (e.g. number of hot days, number of tropical nights). These parameters are calculated for each grid cell (5 km x 5 km) in Bavaria for all years from 1971 to 2100.

Additional key messages

- Additionally stronger increase of temperatures in summer → days with temperature of min. 25°C on average
 - Reference period 1971-2000: 10 days
 - Around 2055: + 16 days (RCP8.5)
 - Around 2085: + 33 days (RCP8.5)
- Milder winters, precipitation at low elevations as rain, shorter snow season impacts water balance → days with temperature below 0°C on average
 - Reference period 1971-2000: 41 days
 - Around 2055: - 19 days (RCP8.5)
 - Around 2085: - 30 days (RCP8.5)
- For changes in annual precipitation no clear trend can be seen for the Alpine region, related to precipitation amount.
- Hardly any seasonal redistribution of precipitation under RCP2.6.
- Seasonal redistribution of precipitation under RCP8.5:
 - Increase in precipitation amount in spring.
 - Decrease of precipitation amount in summer by - 10-24%.
 - Hardly any changes in autumn and winter
- Heavy rainfall events become more frequent and intense, especially in summer.
- Dry summers increase, due to stronger evaporation and changes in the water balance.
- The statements on precipitation are generally less reliable because they show a high spatial and temporal variability; the statements on temperatures are more reliable.

Table 4: Climate scenarios Bavarian Alps (Source: Bayerisches Landesamt für Umwelt (Hrsg.) (2021): Klima-Faktenblätter [Alpen] – Klima der Vergangenheit und Zukunft, Infoblatt – Augsburg.)

Reference period 1971-2000	Near future 2021-2050			Middle future 2041-2070			Far future 2071-2100		
Climate region: Bavarian Alps (3 799 km², height: 456 – 2 962 m, average height: 1 150 m) Scenario RCP2.6 “with climate protection”									
Temperature									
	Mean value	Range from ...	... to	Mean value	Range from ...	... to	Mean value	Range from ...	... to
annual mean [°C]	+1.0	+0.8	+1.5	+1.2	+0.9	+1.7	+1.1	+0.8	1.6
heat waves *	+1.7	+1.3	+2.9	+1.9	+1.4	+3.3	+1.8	+1.1	+2.9
frost days	-18	-27	-11	-19	-35	-12	-19	-30	-12
Precipitation									
annual	+4%	-4%	+10%	+1%	-6%	+8%	+3%	-5%	+11%

* Count of periods with at least 3 days with average temperature >95% of the days in the reference period

Reference period 1971-2000	Near future 2021-2050			Middle future 2041-2070			Far future 2071-2100		
Climate region: Bavarian Alps (3 799 km², height: 456 – 2 962 m, average height: 1 150 m) Scenario RCP8.5 “no mitigation”									
Temperature									
	Mean value	Range from ...	... to	Mean value	Range from ...	... to	Mean value	Range from ...	... to
annual mean [°C]	+1.5	+1.0	+2.3	+2.5	+1.9	+3.4	+4.1	+3.4	+5.1
heat waves ¹	+2.5	+1.8	+3.4	+3.7	+2.7	+4.9	+5.4	+4.0	+6.5
frost days	-26	-45	-14	-45	-71	-28	-77	-111	-49
Precipitation									
annual	+3%	-10%	+12%	+2%	-12%	+11%	+0%	-18%	+15%

Italy

The climate projections are based on Med-CORDEX and were created from four models. Data for grid points within the national territory were extracted from the results.

Overall, the data set selected for analysing the climate projections in Italy can be considered as a 5-dimensional matrix, which is represented as follows:

1 - the climate variable: 4 variables (minimum, maximum, mean temperature and cumulative precipitation) and 8 indices (2 indices for minimum temperature, 2 for maximum temperature, 4 for precipitation) were analysed;

2 - the model (4 models);

3 - the scenario (2 scenarios: RCP4.5 and RCP8.5);

4 - the time horizon (3 time horizons, represented by 30-year periods: 2021-2050; 2041- 2070; 2061-2090);

5 - the period of the year to which the statistics relate (whole year and each of the four seasons).

Furthermore, the report includes cartographic representations showing regional differences.

Table 5: Climate scenarios Italy (ISPRA 2015)

Reference period	Near future 2021-2050		Middle future 2041-2070		Far future 2061-2090	
Scenario	RCP4.5	RCP8.5	RCP4.5	RCP8.5	RCP4.5	RCP8.5
Temperature						
annual mean	+1.25 to +1.75°C	+1.5 to +2.0°C	+1.75 and +2.25°C	+2.75 to +3.25°	+2.0 and +2.5°C	+3.75 to +4.50°C
Precipitation						
annual					-8% to +5%	-15% to +2%

Additional information about precipitation

In contrast to temperature, the time course and distribution of cumulative annual precipitation are quite different from model to model. At the first time horizon (30-year period 2021-2050), only one model predicts a decrease in precipitation over almost the entire national territory, most markedly in northern Italy, with decreases of 150 to 200 mm compared to 1971-2000. For the other models, Italy is divided between areas in which a decrease is predicted and areas in which an increase in precipitation is predicted, of weak or moderate magnitude (less than 100 mm change in absolute value). The areas with positive or negative variation differ from model to model. As an ensemble mean, this results in a weak decrease in precipitation rather uniformly across the country.

The picture changes further if we look at the last time horizon (2061-2090) with one model predicting an increase in precipitation almost everywhere, with the exception of the central Tyrrhenian slope, while the others predict a more widespread decrease in precipitation, of weak or moderate intensity. Again, there is no uniformity in identifying the areas with the most

marked variations. The average of the variations predicted by the four models (ensemble mean) is still represented by a fairly uniform distribution of predominantly negative values but with a weak signal.

Even in the RCP8.5 scenario, the models provide different indications regarding the distribution of precipitation over the territory (Figure 3).

At the first time horizon, only one model predicts a decrease in precipitation over almost the entire national territory; two models indicate a weak or moderate reduction (less than 100 mm) over most of Italy and a weak increase in the north-east; one model shows a prevalence of areas characterised by weak increases in precipitation, with more marked values in the eastern Alpine arc (variations greater than 100 mm).

The ensemble mean map shows a weak decrease in precipitation rather uniformly over most of the territory, with the exception of north-eastern Italy for which there is a weak increase.

At the second (2041-2070) and third time horizons (2061-2090), three models show a decrease in precipitation over almost the entire national territory, although with discordant indications on the areas with the most marked decrease. One model, on the other hand, predicts an increase in precipitation over the Alps and on the Adriatic and Ionian coasts. The average of the changes predicted by the four models indicates a widespread but weak to moderate decrease in precipitation for both 30-year periods.

Liechtenstein

For Liechtenstein, the projections are based on Swiss climate scenarios CH2018 (cf. p. 20). They represent the reduction paths RCP2.6 and 8.5.

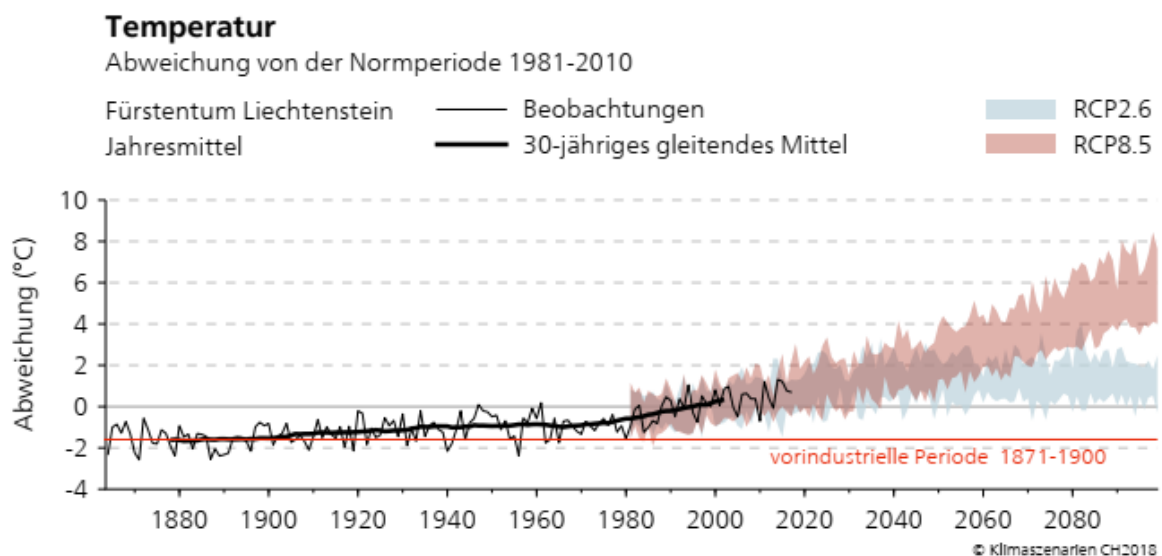


Figure 4: Change of temperature (Source: NCCS (ed.) 2021, p. 6)

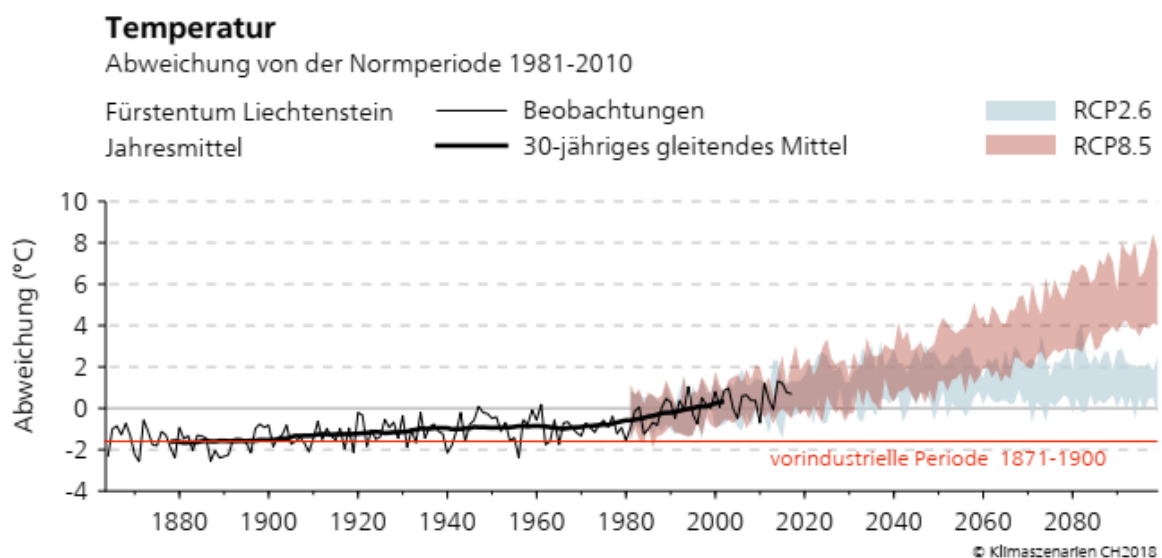


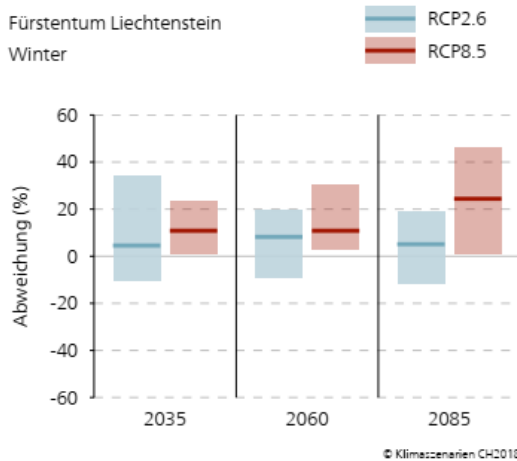
Figure 4 shows the observed and expected future temperature development in the Principality of Liechtenstein, represented as a deviation from the mean temperature of the standard period 1981-2010. From 1981 onwards, the projections for two emission scenarios (RCP2.6 blue and RCP8.5 red) including the uncertainty range are shown. The red line shows the temperature level of the pre-industrial reference period 1871-1900 in the Principality of Liechtenstein.

Niederschlag

Abweichung von der Normperiode 1981-2010

Fürstentum Liechtenstein

Winter

**Niederschlag**

Abweichung von der Normperiode 1981-2010

Fürstentum Liechtenstein

Sommer

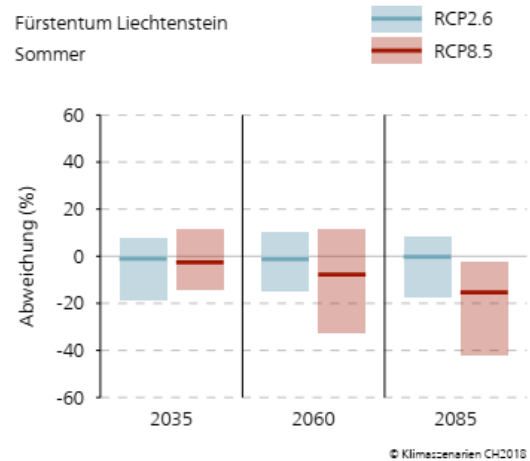


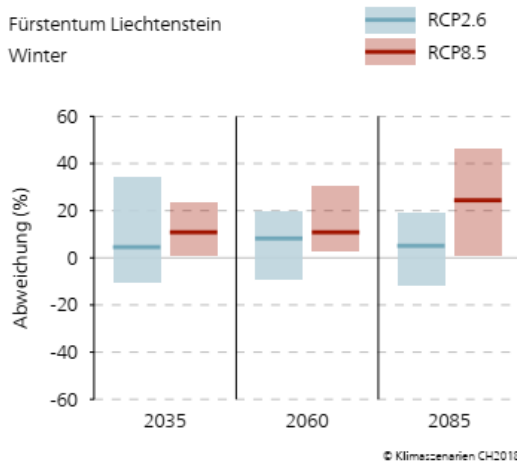
Figure 5: Change of precipitation in winter and summer (Source: NCCS (ed.) 2021, p. 7)

Niederschlag

Abweichung von der Normperiode 1981-2010

Fürstentum Liechtenstein

Winter

**Niederschlag**

Abweichung von der Normperiode 1981-2010

Fürstentum Liechtenstein

Sommer

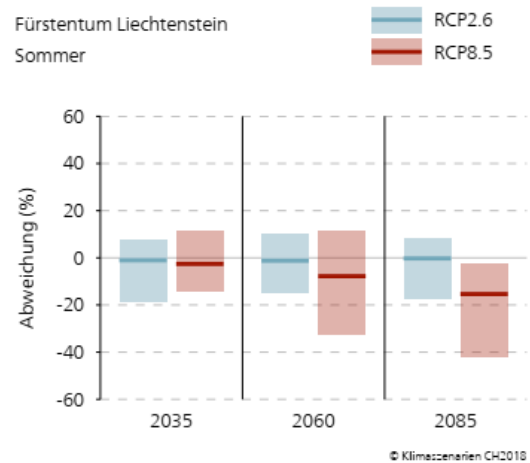


Figure 5 shows the expected future changes in precipitation in winter and summer for the Principality of Liechtenstein. The values show the changes for three future 30-year periods up to the end of the century (the central year is indicated in each case) assuming the two emission scenarios RCP2.6 (blue) and RCP8.5 (red) and compared to the standard period 1981-2010. The horizontal line shows the best estimate of the change signal in each case, the bars show the associated uncertainty range.

Additional key messages concerning extreme weather (NCCS 2021):

- Fewer frost days in all altitude levels.
- Heatwaves and hot days and nights are becoming more frequent and more extreme.
- Summer droughts on the increase as the average amount of precipitation in the summer months will decrease in the long term and evaporation will increase. As a result, soils will become drier, there will be fewer rainy days and the longest period without precipitation will last longer.

- Heavy precipitation is on the rise. This affects all seasons, but especially winter. Even rare extreme events such as a hundred-year flood are much more severe.

In addition to the fact sheet summarized here, the latest version of the CH2018Webatlas⁷ contains graphics for the Principality of Liechtenstein.

Slovenia

The future climate change scenarios are based on the results of climate models driven by the European EURO-CORDEX project. The results of 6 regional climate models are used, which best simulated the climate conditions in Slovenia, given the historical data. Thus, for Slovenia, in addition to the mean estimates of future changes, threshold values for Slovenia (minimum and maximum) of the model calculations are provided. The results of the regional model projections are presented at a resolution of 14 km. Future climate scenarios are calculated for two future 30-year periods: the near future (2011-2040) and the mid-century (2041-2070). Changes in temperature, precipitation and potential evapotranspiration are presented as deviations of the 30-year period from the 1981-2010 reference period. For each season and for the whole year, the mean (median) of the results of all six bracketed regional models is presented, together with the lower and upper bounds of the expected changes. (Ministrstvo za okolje in prostor, Agencija Republike Slovenije za okolje o.d.)

There are projections also for 2071-2100 which are presented by the Environmental Agency of SI - CC portal - Atlas of climate projections by 2100 for 5 components, calculations, graphs, pictures. They are available in Slovenian language.⁸

Key messages (Ministrstvo za okolje in prostor, Agencija Republike Slovenije za okolje 2018)

- The increase in air temperature will continue in the 21st century, and the magnitude of the increase depends strongly on the scenario of greenhouse gas emissions. Under the optimistic emissions scenario RCP2.6, the temperature will rise by about 1.3°C by the end of the century compared to 1981-2010, by about 2°C under the moderately optimistic emissions scenario RCP4.5, and by about 4.1°C under the pessimistic emissions scenario RCP8.5.
- The temperature is likely to rise the most in winter, only slightly less in summer and autumn, and the least in spring.
- Rising temperatures will significantly increase the heat load. Under the optimistic emissions scenario, the number of hot days in Slovenia will increase by about 6 days by the end of the century, by about 11 days under the moderately optimistic emissions scenario and by about 27 days under the pessimistic emissions scenario. In all emissions scenarios, the number and duration of heat waves will increase.
- The spring phenological development of plants will be earlier. In the medium optimistic emissions scenario, forest tree leafing will be about two weeks and in the pessimistic emissions scenario up to 40 days earlier than in the 1981-2010 comparison period.
- The length of the growing season will increase with an earlier start in spring and a later end in autumn.

⁷ <https://www.nccs.admin.ch/nccs/de/home/materialien-und-daten/daten/ch2018-webatlas.html> (02.04.2024)

⁸ <https://meteo.arso.gov.si/uploads/probase/www/climate/OPS21/Priloge-app/#/izbor> (02.04.2024)

- The frequency of spring frosts will remain at a similar level to the 1981-2010 reference period.
- Annual and winter precipitation will increase significantly under the moderately optimistic and pessimistic emission scenarios in the mid- to late 21st century. The average increase in annual precipitation at the end of the century compared to the 1981-2010 period will be up to 20%.
- The increase in precipitation will be even greater in winter, slightly more so in the east of the country. Already by mid-century, winter precipitation will increase by up to 40% in eastern Slovenia, and by the end of the century, winter precipitation will increase by more than 60% under the pessimistic emissions scenario.
- In other seasons, the direction and magnitude of the change in precipitation depends strongly on the emissions scenario and partly on the model, and the changes are mostly smaller than the natural variability of precipitation.
- Intensity and frequency of extreme precipitation events will increase, and the increase will be most pronounced under the pessimistic emissions scenario.

Switzerland

The models used for the CH2018 climate scenarios are part of EURO-CORDEX. Simulations with a total of 21 different models form the basis of the CH2018 climate scenarios. Analysing several simulations makes it possible to estimate the uncertainties associated with the climate scenarios. Statistical methods are used to further refine the resolution of the results: if reliable measurements are available over many years, statements can be made for specific meteorological measurement locations or even area-wide maps with a horizontal mesh size of two kilometres - for example for temperature and precipitation. The simulated changes vary slightly from place to place. The CH2018 climate scenarios represent the reduction paths RCP2.6 and 8.5.

The current CH2018 climate scenarios are currently being revised in the “Climate CH2025” project.

The key messages of the climate scenarios are presented in the form of maps, box plots and key messages for each canton. The following sums up the core content (NCCS 2018):

- Ground level air temperature will increase more in Switzerland than in the global mean.
- Drier and hotter summers
 - Rising temperatures (by 2.5°C to 4.5°C by 2060, by 4°C to 7°C by 2085)
 - Decrease in precipitation (by -25% to + 10% by 2060, by -40% to 0% by 2085)
 - Increase of evaporation → soils become drier
 - Fewer rainy days and longer dry periods
 - Annual maximum temperatures increase especially -> heat waves and hot days/nights become more frequent and extreme (number of “hot days” around 2060: + 3 to + 17 days; around 2085: + 12 to +37 days)
- Milder winters
 - Increase in precipitation
 - Precipitation as rain at lower elevations, decrease in snow days

- Increase in temperatures (by 2060 by +2°C to +3.5°C; by 2085 by +3°C to +5.5°C)
- Increase in 0°C limit by 2060 around 400m to 650m; by 2085 around 700m to 1050m)
- Heavy rain events become more frequent and intense (increase by 10% (2060) to 20% (2085)).
- Extreme weather events become more intense.
- The statements on precipitation are generally less reliable because they show a high spatial and temporal variability; the statements on temperatures are more reliable.

More information on the regional and Swiss-wide climate scenarios is accessible by the CH2018 web atlas⁹ which shows the full range of information on Switzerland's climate future. The future changes can also be explored there for the individual cantons and various altitude levels.

⁹ <https://www.nccs.admin.ch/nccs/de/home/klimawandel-und-auswirkungen/schweizer-klimaszenarien/ch2018-webatlas.html>
(02.04.2024)

Table 6: Climate Scenarios Switzerland (Source : CH2018 Technical report, p. 209ff)

Reference period 1981 - 2010	Near future 2020 – 2049 (“2035”)			Middle future 2045 – 2074 (“2060”)			Far future 2070 – 2099 (“2085”)		
Scenario	RCP2.6	RCP4.5	RCP8.5	RCP2.6	RCP4.5	RCP8.5	RCP2.6	RCP4.5	RCP8.5
Temperature									
annual mean	+1.1 (+0.6 to +1.6)	+1.2 (+0.7 to +1.6)	+1.4 (+0.9 to +1.9)	+1.2 (+0.7 to +1.9)	+1.8 (+1.2 to +2.7)	+2.6 (+2.0 to +3.3)	+1.2 (+0.6 to +1.9)	+2.1 (+1.5 to +3.1)	+4.3 (+3.3 to +5.4)
Very hot days (TX99)	+2 (+0 to +5)	+3 (+1 to +6)	+2 (+1 to +6)	+2 (+0 to +8)	+6 (+2 to +10)	+7 (+3 to +17)	+2 (+1 to +7)	+6 (+3 to +13)	+21 (+12 to +37)
Precipitation									
Summer precipitation [%]	-3 (-16 to +6)	-5 (-16 to +2)	-4 (-13 to +8)	-3 (-16 to +7)	-9 (-19 to +0)	-11 (-25 to +9)	-4 (-15 to +9)	-8 (-22 to +7)	-21 (-39 to +2)
Winter precipitation [%]	+6 (-6 to +18)	+8 (-2 to +17)	+8 (-1 to +16)	+7 (-1 to +16)	+7 (-5 to +16)	+8 (-3 to +21)	+6 (-3 to +19)	+8 (-6 to +19)	+15 (+2 to +24)

4. SCENARIO-BASED INDICATIONS FOR SPATIALLY RELEVANT CHALLENGES

Relevance of climate projections for spatial planning

The climate projections serve as a scientifically sound basis for identifying and dimensioning the necessary measures for climate change adaptation. Depending on the requirements of the different sectors for adaptation (such as natural hazards, water management, agriculture ...), different parameters from the scenarios are needed. It should be noted that not all parameters can be modelled equally well.

To assess the needed adaptation measures for regional/spatial planning issues, the climate scenarios have to be adapted to “spatial” language, as it was done e.g. in the C2_Alps project for pilot areas (in Slovenia Gorenjska region). This requires involvement of specific experts who could use climate scenario data to define potential impacts in the space (water table increase, consequent floods etc.) so the planning teams could assess the impacts for three spatial uses - settlements, infrastructure, and energy. This means that one has to invest quite some work to make climate change models useful for spatial planning.

Changes in temperature

Temperature changes are described in the projections based on various parameters. These parameters include the annual mean temperature, which can be projected with a high degree of probability in the scenarios, as the different models show a high degree of agreement with each other.

But there is greater uncertainty in parameters that are equally relevant for climate change adaptation as the annual average temperature. Examples are the change in seasonal average temperatures, and extreme values such as the number of frost and ice days, heat days and heat waves, and the length of these frost and heat periods. Further important parameters are the length of the growing season, the time of the first and last frost day, and the number of days with heating and cooling requirements in buildings.

Changes in precipitation

Here too, knowledge of the change in the annual precipitation total is not sufficient to identify the necessary adaptation measures in spatial planning. Especially as the annual precipitation totals show little change compared to the seasonal distribution of precipitation (see Chapter 2 Precipitation). Extreme events that can lead to floods or other natural hazards (such as landslides, mudslides, avalanches) are particularly relevant in terms of spatial planning.

Fields of action for spatial planning and interfaces with sectoral planning

Natural hazards and spatial planning

Climate change massively affects the Alpine environmental conditions. The expected temperature rise will not only decrease snow cover, but also leads to the retreat of glaciers and permafrost. As a result, rock and loose material can be mobilized more easily and the risk of mass displacement (rockfalls, landslides, debris flows, etc.) increases accordingly. Also

changes in precipitation patterns, especially extreme precipitation events have an impact on risk planning. *“Spatial planning is actually the most effective preventive measure against natural hazards when it comes to new (constructive) developments because it can keep hazard-prone areas undeveloped by prohibiting development or only allowing hazard-adapted development....”*

Spatial planning authorities therefore face different challenges when it comes to natural hazards:

- *How should existing settlement areas threatened by natural hazards be dealt with?*
- *How can strongly endangered areas be kept free of new development?*
- *What development is acceptable in hazard-prone areas with new protection measures?*
- *How can residual risk be adequately considered in planning decisions?”* (Alpine Convention 2019, p. 32)

Changes in natural risks may induce extended land requirements for natural hazard prevention and extreme weather events. Spatial planning as coordinator of land uses and sectoral policies has to address these challenges in coordination with natural hazard experts, such as the Natural Hazards Working Group of the Alpine Convention (PLANALP).

Regional/urban planning and cross-sectoral integration

The expected rise in summer heat and heatwaves require a good ventilation of the settlements. Spatial planning is called upon to safeguard these important areas - cold air generation areas as well as fresh air corridors - through planning. This task must be fulfilled jointly by regional and urban planning levels.

Coherent settlement planning on a regional scale is needed to address the increasing settlement pressure on higher altitudes (= climatically favourable areas) and agricultural land.

In a broader sense, the far-reaching spatial consequences of climate change require a cross-sectoral integration of adaptation and mitigation strategies. Efforts on behalf of spatial planning and territorial development lead to more comprehensive, tangible and lasting outcomes if they are supported through adapted sectoral policies and vice versa.

Energy production and supply

The Alps are traditionally a major producer of hydroelectricity. Changes in precipitation also mean changes in runoff and thus have an impact on hydropower generation and the cooling of (nuclear) power plants. The demand for reservoirs may rise in this context.

To contribute to the mitigation of climate change, the Alpine Convention committed already in the Energy Protocol Art 6 (1) *“...to promote and give preferential treatment to renewable energy resources which are environmentally friendly and do not harm the countryside.”* and further in Art 6 (2) *“2. They shall also encourage the use of decentralised plants for the use of renewable energy sources such as water, the sun and biomass.”* To this list meanwhile wind power could be added. All these energy production plants (except solar energy on existing roofs) have interfaces with spatial planning.

Water management

Climate change has a decisive impact on future water availability, which is an important factor not only for drinking water, but also for the economic development (agriculture and irrigation, tourism, households, hydropower among others) not only for the Alps, but also for the foothills and the larger peri-Alpine area. The changes in water management may trigger the demand of new reservoirs, which serve multiple purposes, such as hydropower, public supply, irrigation, heating/cooling, snow making etc.

Within the Alpine Convention, the Water Management in the Alps Platform (2009-2019) organised the exchange between the water management stakeholders and experts. The results of their work are still available (<https://www.alpconv.org/en/home/topics/water-management/>), but climate change may require a more intensive exchange with spatial planning.

Tourism

Tourism is one of the main sources of income in the Alps, about 40% of the Alpine municipalities display significant tourism activity.¹⁰ Climate change has a significant impact on Alpine tourism, not just in winter, but over the whole year. As tourism has high spatial requirements for its infrastructure, changes in tourism have an impact on spatial planning. Examples of this are:

- Ski infrastructure: some of them may be abandoned and be renaturalised, but others intend to further expand their infrastructures or try to use/adapt them to whole year tourism.
- Continued efforts to develop touristic alternatives to snow-based tourism require land resources for other infrastructures, such as sightseeing platforms at exposed places, downhill trails, flying foxes, summer toboggans etc.
- Visitor management for climatic compensation areas particularly in the vicinity of peri-Alpine or inner-Alpine urban areas/agglomerations to manage increasing visitor flows and pressure on the recreational landscape.
- Cross-border coordination of touristic adaptation strategies to avoid “races to the bottom” in regard to snow-making infrastructure and other touristic installations.

Project examples on these topics

Responses in the spatial planning sphere to climate change have already been addressed in-depth by a large number of projects at the regional, national and international resp. Alpine-wide level. Table 7 shows some related projects (by no means comprehensive).

Table 7: Overview of projects

Project title	Year	Description
PARAmount (imProved Accessibility)	01.09.2009 - 01.11.2012	As a result of climatic trends, the vulnerability of transport infrastructure to natural hazards has increased, but transport and accessibility need to be secure and ensured in the Alps. Within the framework of PARAmount, existing tools and practices for assessing avalanches, rock fall and debris

¹⁰ <https://www.alpconv.org/en/home/topics/tourism/>

		flow were improved and tools on the visualization of natural hazard impacts were developed and assessed. In addition, hazard early warning systems were installed in the pilot areas, increasing the reliability of risk forecast. https://naturgefahren.provinz.bz.it/de/projekte/paramount
CC.Alps	01.01.2011 - 31.12.2014	With the "CC.alps" project, CIPRA has put climate measures in the Alps to the test. CIPRA has collected climate protection and adaptation activities in the Alps and examined the impact of these climate measures on the environment, economy and society. https://www.cipra.org/de/cipra/international/projekte/abgeschlossen/cc-alps
C3-Alps Capitalising Climate Change Knowledge for Adaptation in the Alpine Space	01.01.2012 - 31.12.2014	Building on the results of previous projects and initiatives on adaptation to climate change in the Alps, C3-Alps seeks to synthesize, transfer, and implement in policy and practice the best available adaptation knowledge. By applying a knowledge transfer concept driven by the information and communication needs of target groups, the project optimizes the usability of available knowledge resources in an attempt to bridge the gap between the generation of adaptation knowledge and its application in real-world decision-making. https://climate-adapt.eea.europa.eu/en/metadata/projects/c3-alps-2013-capitalising-climate-change-knowledge-for-adaptation-in-the-alpine-space
CLISP Climate Change Adaptation by Spatial Planning in the Alpine Space	2008 - 2011	CLISP aims at preventing, reducing and mitigating climate-change related spatial conflicts, vulnerability of spatial development and spatial structures to adverse climate change impacts, and consequential damages and costs. As climate change adaptation, including an integrated approach to adaptation and mitigation issues is still a novel field for spatial planning policy and administration, CLISP is to be regarded as a strategic pilot project. https://climate-adapt.eea.europa.eu/en/metadata/projects/climate-change-adaptation-by-spatial-planning-in-the-alpine-space
AdaptAlp Adaptation to Climate Change in the Alpine Space	01/12/2008 - 01/08/2011	AdaptAlp assessed impacts and adaptation to climate change in the Alpine Space. https://www.lfu.bayern.de/wasser/klimawandel_wasserhaushalt/projekte/adaptalp/index.htm
GoApply Multidimensional governance of climate change adaptation in policy making and practice	11/2016 - 04/2019	GoApply tackled the key challenges of adaptation governance by mapping and comparing existing governance approaches, good practices and innovations to include climate adaptation into sectoral policies and to set-up effective formats of stakeholder interaction. This body of knowledge enables public and non-governmental actors to improve, re-define and better implement their adaptation governance. https://www.alpine-space.eu/project/goapply/

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Climate Scenarios: Linking Climate Change and Spatial Planning

***Contribution to IP_SP1_Step1a
of the Climate Action Plan 2.0***

**Spatial Planning and Sustainable Development Working Group
of the Alpine Convention**

Mandate 2023-2024



ALPENKONVENTION
CONVENTION ALPINE
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Executive Summary

The document provides a comprehensive scoping review that examines the interface between climate change and spatial planning, with a focus on the Alpine region. The review contributes to the Alpine Climate Target System and Step 1a Definition and provision of data concerning the impact of climate scenarios on land use in the Implementation Pathway Spatial Planning. By analysing a wide range of scientific literature, the report aims to map out existing knowledge, identify gaps, and explore how spatial planning and climate change are being addressed in the Alpine region.

The review reveals significant research gaps, particularly in the integration of spatial planning and climate change in the Alpine context. While environmental issues such as disaster risk management and land use change are well covered, other critical areas such as energy and transport receive less attention. Furthermore, the academic literature focuses mainly on local and national studies, with fewer cross-border or pan-Alpine approaches. This fragmentation hinders the development of comprehensive, long-term spatial planning strategies. The existing literature also tends to focus more on sectoral approaches rather than integrated planning strategies, which are necessary for addressing the complex, multi-faceted nature of climate challenges.

The report calls for greater interdisciplinary collaboration and the adoption of integrated planning approaches to better address the challenges posed by climate change. It emphasizes that climate change is a multifaceted issue that requires spatial planning to transcend traditional disciplinary and geographic boundaries. By integrating different sectors and extending the spatial scope beyond local contexts, spatial planning can play a crucial role in promoting sustainable development and enhancing resilience in the Alpine region.

1. BACKGROUND

As a contribution to the Alpine Climate Target System, this scoping review of the interface between climate change and spatial planning contributes to Step 1a Definition and provision of data concerning the impact of climate scenarios on land use in the Implementation Pathway Spatial Planning 1.¹

The Alpine Climate Action Plan 2.0 foresees as Step 1a of its ‘Implementation Pathway Spatial Planning 1’ the definition and provision of data concerning the impact of climate scenarios on land use (Permanent Secretariat of the Alpine Convention 2021:115). The Working Group Spatial Planning and Sustainable Development included this task in its 2023-2024 mandate in the form of following up the Alpine Climate Target System 2050 – here the implementation pathway IP_SP1 – with the planned output of “Definition and provision of data concerning the impact of climate scenarios on land use”.

Against this background, the paper at hand provides an overview of the scientific discourse on the interface between climate change and spatial planning. It addresses the themes and planning foci of a large body of literature collected and analysed through a scoping review. This literature review is useful for identifying the data needs described above. It also shows that there are knowledge gaps in the academic literature on the links between spatial planning and climate change.

2. INTRODUCTION: The Link Between Spatial Planning and Climate Change

When talking about spatial planning, one has to differentiate planning and development. First, planning in a formal and legally binding way is mostly assigned to the local and regional level. Second, spatial development addresses the topic in a less binding, ‘softer’ way. Funding programs, strategic plans, and governance processes play an important role in this field. Spatial planning – in a formal, juridical and technical sense – is mostly organised via domestic mandates. Spatial development can be found throughout the multi-level system, including the pan-Alpine level.

Both spatial planning and development have the task of coordinating sectoral policies and dynamics from a territorial perspective; and vice versa, spatial development and -planning are strongly influenced by sectoral dynamics. The integrated or strategic perspective is an important aspect of the sustainability objective of spatial planning and development: Balancing sectoral demands helps safe-guarding future qualities of the Alps as a living space and habitat (see Figure 1).

¹ <https://alpineclimate2050.org/climate-action-plan-2-0/spatial-planning/pathway-1/>

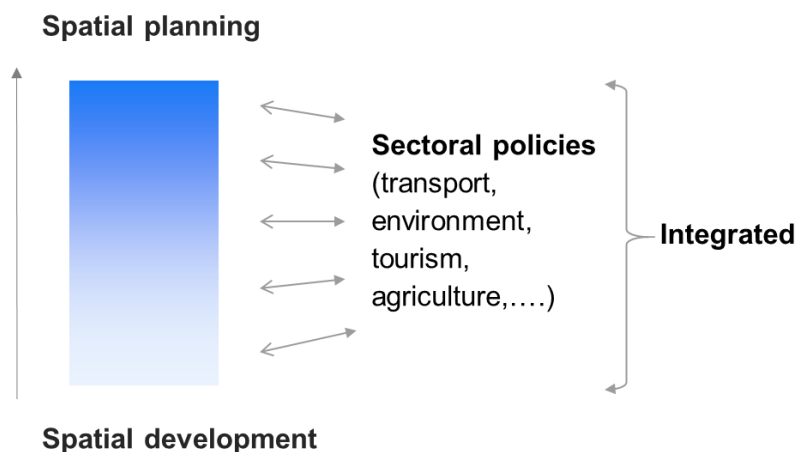


Figure 1: Spatial planning, spatial development and sectoral policies (own elaboration)

Spatial planning has a major potential to address both climate change mitigation and adaptation to its impacts (Hurlimann & March 2012). This understanding is based on the recognition that the spatial configuration of settlements and regions, as well as land use and development, have significant impacts on climate change. There is no doubt about the importance of the interaction between spatial planning and climate change (Biesbroek et al. 2009, Chilla et al. 2022).

Scientific literature reflects the current academic discourse on climate change and spatial planning. A search for “spatial planning” and “climate change” in Scopus, a leading database of international scientific literature, shows around 1,200 results, underscoring this importance. A search request for “climate change” and “Alps” yields almost 4,000 hits. Adding “spatial development” to the query reduces the number of hits to 73. “Spatial planning” instead of “spatial development” lead to only 40 hits. This shows that there is a lot of literature on climate change in the Alps (4,000), much less on the interface between spatial development and climate change (only 73), but much less on the link between spatial planning and climate change (namely 40) in the Alpine region. Against this background, the aim of this study is to explore the thematic interface in the academic discourse.

3. METHOD: Scoping Review

A so-called scoping review is the appropriate method to explore academic discourses. Scoping reviews have been developed as a methodology to map study fields, data sources, approaches and methods (Peters et al. 2015). They are an ideal tool to determine the scope or coverage of a literature-body on a given topic and provide an overview of its focus (Munn et al. 2018). They are also used to identify knowledge gaps, set research agendas and identify implications for decision-making (Tricco et al. 2016). The review process follows obligatory three steps of a scoping review (Peters et al., 2015; Casali et al. 2022): (a) planning the review by developing

selection criteria; (b) identifying relevant literature through database searches, screening and selection; (c) conducting the review and charting the results.

a) Planning the review

The selection criteria for the analysis are the following ones:

- 1) The included papers address the *interface* between spatial planning and climate change. This step excludes studies with a too narrow research focus (e.g. only on climate change without addressing spatial planning).
- 2) Those papers were excluded that have only indirect relevance for spatial planning (e.g. by postulating that a sectoral dynamic is generally important for planning) without addressing planning concretely (i.e. technical planning, policy options, recommendations).
- 3) Papers with a focus on the European Alps were included but not those publications addressing the Alps in New Zealand, Australia and Japan.
- 4) The included papers had to be peer-reviewed and listed in Scopus and Web of Science.

b) Databases and search strategies

The scoping review relies on the Scopus database and Web of Science. Scopus is the abstract and citation database of the Elsevier publishing company and is, in terms of size, amongst the largest databases worldwide (Gurgiser et al 2022; Singh et al 2021). Web of Science is the oldest, most widely used database of publications and was used to ensure the validity of the articles and for its broad and multidisciplinary coverage (Birkle et al. 2020).

Relying on Scopus and Web of Science means excluding non-scientific studies and planning documents that can be highly relevant for spatial planning 'on the ground'. However, the main strength of this approach is its systematic coverage of scientific publications, which is supported by quality assurance processes and has gained international recognition. As a result, a scoping review reflects the internationally available knowledge based on scientific publications; even if it does not reflect all regional and local expertise from practitioners.

The data query was carried out on 26th October 2023. The 'all-time' timeframe was chosen, and no specific language was selected. The search is based on Boolean operators. Six queries within the 'article title', 'abstract', and 'keywords' were performed.

- (“spatial planning” OR “spatial development” AND “climate change”) AND “alps**”)
- (“spatial planning” OR “spatial development” AND “climate change”) AND “alpine**”)
- Spatial development AND climate change AND alps
- Spatial development AND climate change AND alpine
- Spatial planning AND climate change AND alps
- Spatial planning AND climate change AND alpine

1,159 potentially relevant articles were identified through the searches.

c) Review and analysis

In the first step, the studies were screened for relevance based on title scans and 1,068 articles were excluded. This step was performed independently by two reviewers. There were hardly

any discrepancies between the selection results. After the title scans, only 91 papers remained relevant (Figure 2). Once the articles had been selected according to the above criteria, the literature was analysed. In order to map the themes and planning focus, the information was collected in tables by analysing each article. The analysis covered two different perspectives:

First, the topics covered in the papers were categorized to identify priority research areas and research gaps. Twelve sectoral priorities were defined:

- climate change adaptation (long-term measures),
- water management,
- disaster risk management,
- land-use changes,
- agriculture,
- forestry,
- biodiversity,
- ecosystem services,
- energy,
- economic development,
- tourism and
- transport.

Secondly, the documents were categorised based on the scale they addressed: local/regional/national and transnational or cross-border. They were also categorised based on whether they focused solely on one sector (sectoral planning) or integrated (cross-sectoral) planning, which takes a more holistic approach to address multiple issues.

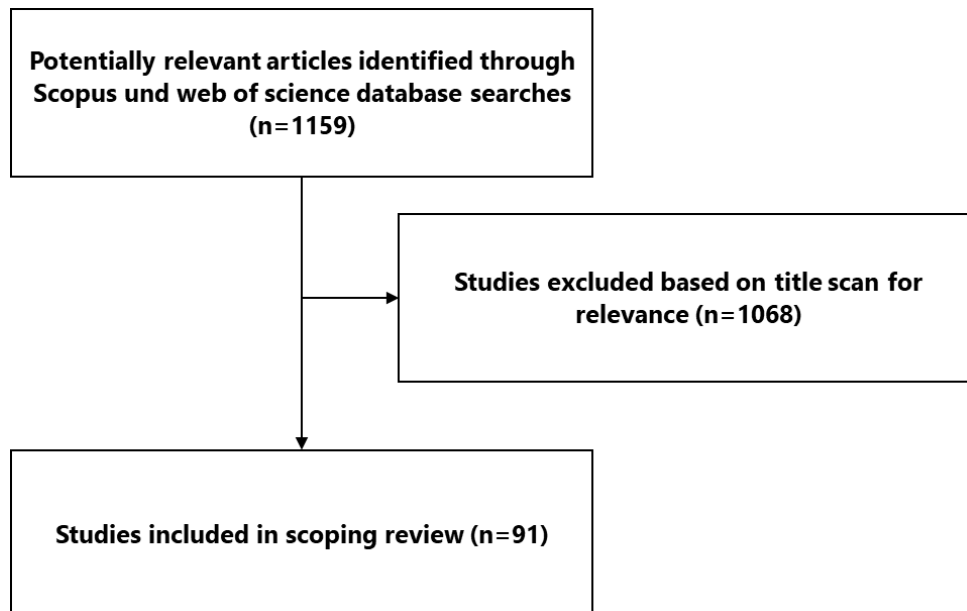


Figure 2: Scoping review process of the study selection

4. FINDINGS

The time distribution of the publications is shown in Figure 3. The earliest paper on spatial planning and climate change dates back to 2001 and focuses on flood events in the (Alpine) Rhine basin. Two peaks in the number of papers can be observed, one in 2013 and the other in 2021. The number of papers on this topic has been increasing since 2012, with a low of four papers in 2016. The significance of spatial planning and development in mitigating and adapting to climate change has gained importance in academic discourse over the last decade.

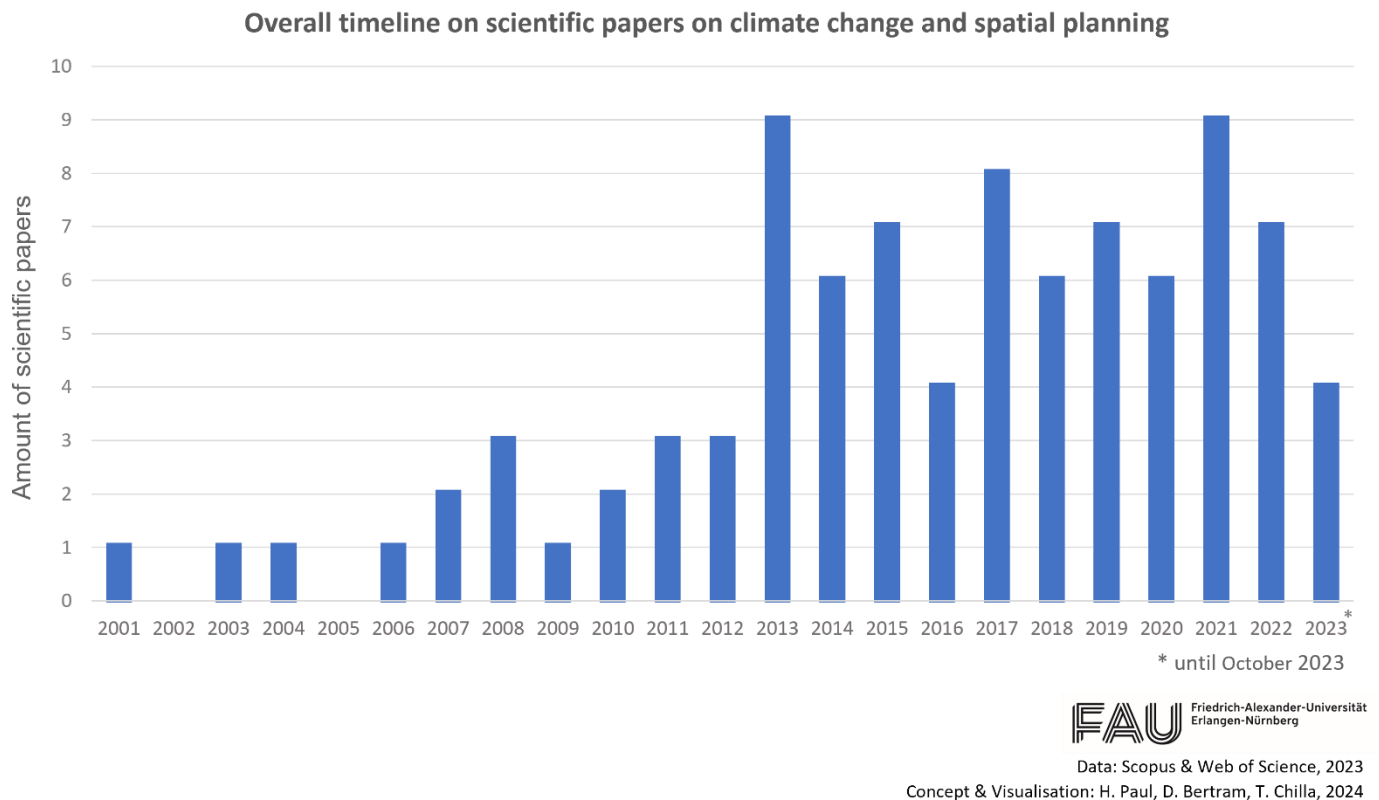


Figure 3: Development of the publication intensity over time

In addition to analysing the temporal distribution of research publications, the thematic distribution of the body of literature was also mapped (Figure 4). The chart provides a comprehensive overview of the literature categorised by different thematic domains, ranging from climate change adaptation to transport. Each bubble within the chart represents a specific theme, with its size proportional to the number of papers addressing that particular topic.

Thematic distribution over time

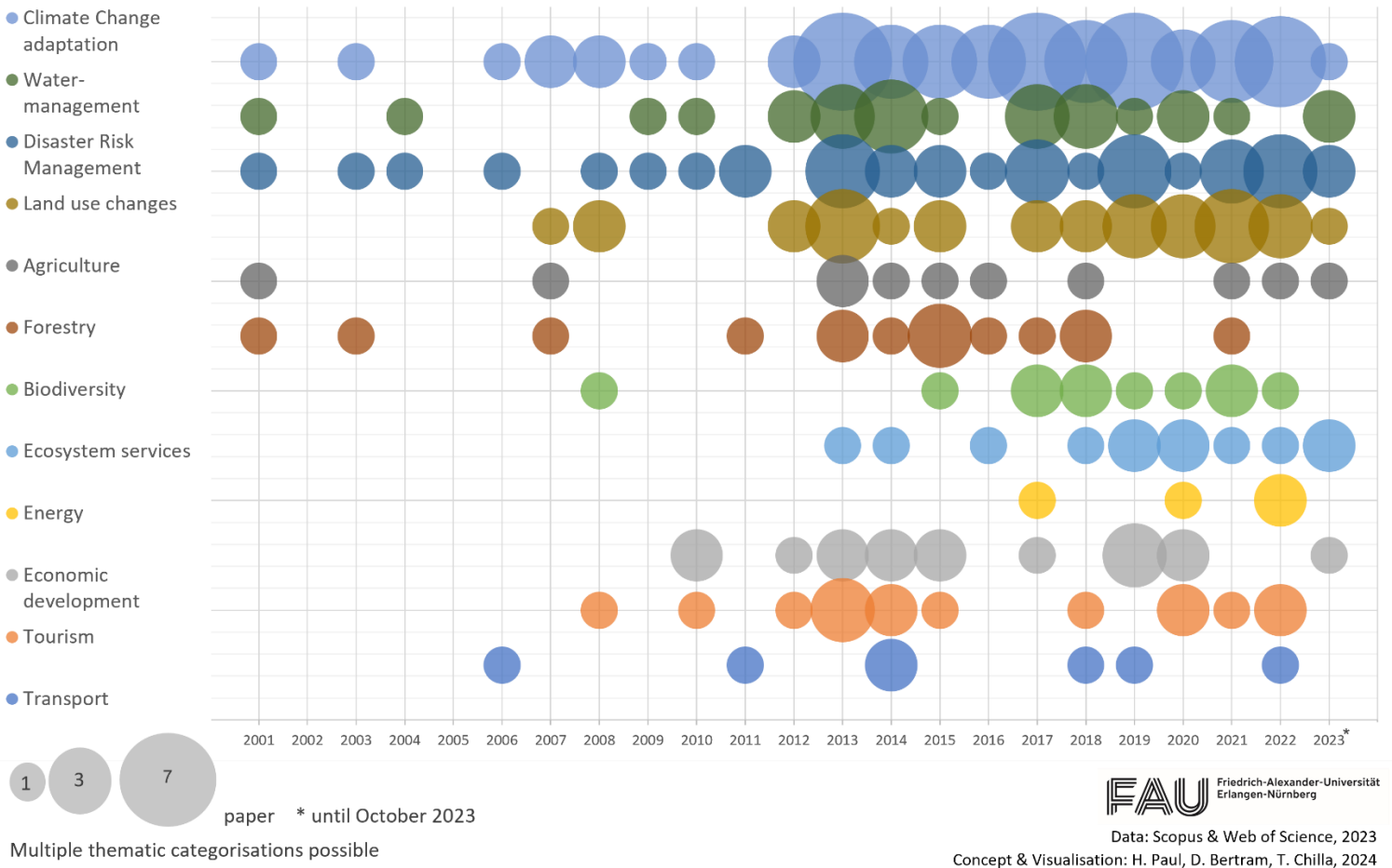


Figure 4: Thematic distribution over time

It is evident that certain issues persist throughout the timeline, particularly climate change adaptation and disaster risk management, which have been long-standing concerns in environmental research. The topics addressed include for example the debate concerning protection areas in the thematic group 'forestry', and the vulnerability of ski tourism and implementation of sustainable tourism via spatial development in the thematic group 'tourism'. Additionally, more recent topics like energy and transport are also discussed, although they are not novel in the academic discourse on the interface between climate change and spatial planning. Overall, the body of literature predominantly focuses on environmental concerns, with less attention given to other sectors such as tourism or the economy.

Figure 5 shows the distribution of the planning focus and the distribution of the scales in the papers. The left bar shows the local/regional and national analysis, the right bar the transnational (cross-border or pan-Alpine) ones. The blue bar represents a sectoral planning approach while the yellow one is integrated or cross-sectoral. Integrated spatial planning generally refers to spatial planning that goes beyond conventional or single-purpose land-use planning. It is comprehensive, integrated and long-term. Integrated planning takes into account the mandates and impacts of other sectoral policies that affect the territory of a region and the use of

its land resource. The objective of integrated spatial planning involves planning for future development and investment opportunities in a specific geographic area, taking into account all relevant policies and their impact on the area and its inhabitants (Lausche 2019). Sectoral planning, such as transportation or landscape planning, uses sector-specific laws to balance sectoral tasks and measures, affecting the spatial development and function of an area by utilizing space and land (Danielzyk & Münter 2018).

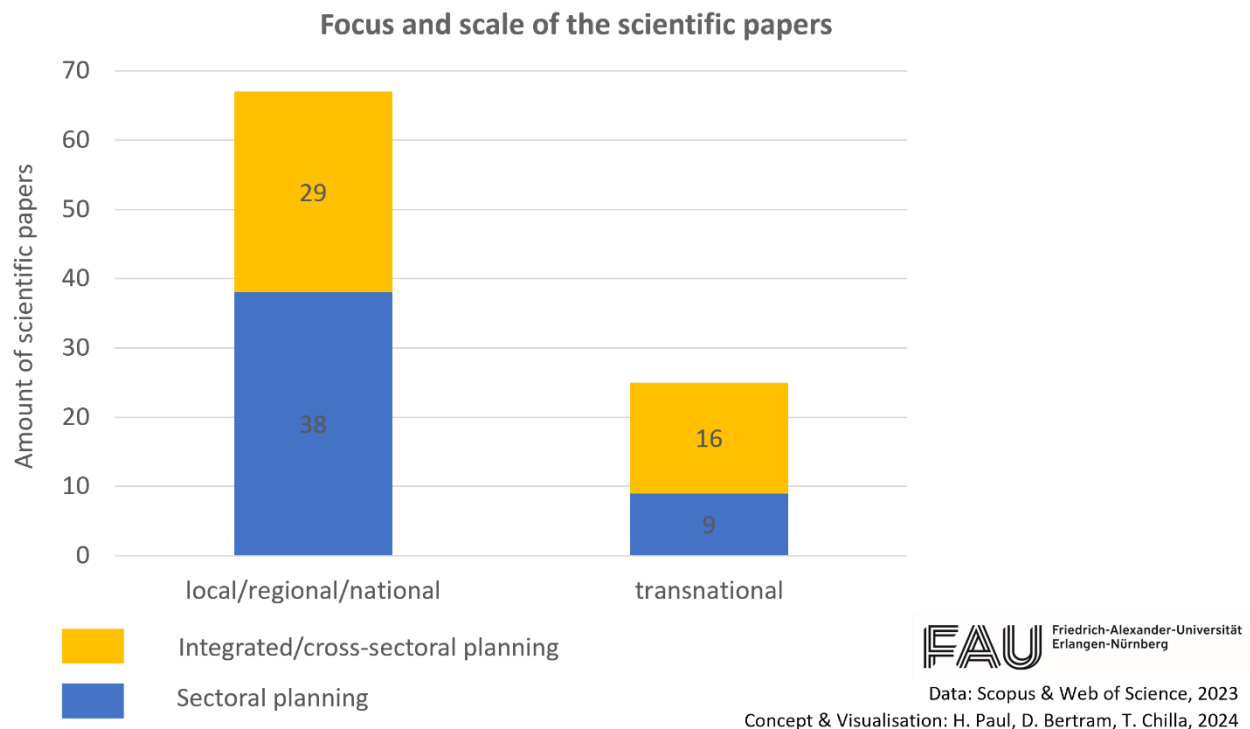


Figure 5: Focus and scale of the analysed publications

It is obvious that there are far more local or national studies than transnational ones. This is because the academic articles focus more on local or national case studies than on a pan-Alpine or cross-border perspective. The cross-sectoral approach is also well represented in the academic debate, particularly in papers with a transnational focus. However, in order to address the current challenges of climate change, local and sectoral thinking is not sufficient. An integrated, cross-border planning approach like the Alpine Spatial Planning perspective bears obvious potential.

5. CONCLUSION

The scoping review on the interface of spatial planning and climate change scientific literature in the Alpine region has revealed important gaps. Although there is a substantial body of literature addressing climate change as such, there are only few publications that integrate spatial development/planning and climate change. The analysis suggests that there are more sector-specific studies than those taking an integrated spatial perspective. Additionally, the focus is primarily on local and national case studies, rather than on the cross-border or pan-Alpine

scale. Furthermore, the literature predominantly focuses on environmental concerns (e.g. land use changes or disaster risk management), with less attention to other important spatial planning sectors, such as transport or energy issues. This limits the understanding of the multifaceted challenges posed by climate change and inhibits the development of integrated planning strategies.

This finding can be seen as a call for more interdisciplinary collaboration and a broader consideration of spatial planning approaches in climate change research and policy development. The analysis shows the potential of integrated spatial planning approaches to address the complex challenges posed by climate change in the Alpine region and beyond. By transcending traditional disciplinary boundaries and adopting a long-term, integrated perspective, spatial planning can facilitate sustainable development and resilience-building.

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Land Saving Targets in Alpine Countries: Status Quo and Challenges

***Contribution to IP_SP1_Step 3
of the Climate Action Plan 2.0***

**Spatial Planning and Sustainable Development Working Group
of the Alpine Convention**

Mandate 2023-2024



ALPENKONVENTION
CONVENTION ALPINE
ALPSKA KONVENCIJA
CONVENZIONE DELLE ALPI

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Executive Summary

Background

The report on land saving targets in Alpine countries represents Step 3 of the Climate Action Plan 2.0 (CAP 2.0) of the Alpine Convention, specifically addressing the implementation of the Spatial Planning for Climate Action. The focus is on assessing land-saving targets within Alpine Convention countries and identifying challenges these countries face in achieving them. The survey on quantitative land saving targets was initially conducted during the 2021-2022 mandate phase of the Spatial Planning and Sustainable Development Working Group (SPSD WG). During the 2023-2024 mandate phase the survey was complemented by an assessment of challenges based on expert interviews and literature reviews. The status-quo of quantitative land-saving targets and land take rates displayed in this report therefore reflects the situation in 2022.

The overarching goal of Step 3 of the CAP 2.0 is to support the European Union's objective of continuously decreasing land take and ultimately achieving zero net land take by 2050, meaning the amount of land consumed for urban development and infrastructure is balanced by land reclaimed or restored to its natural state. This is a key component of European environmental policies, such as the EU Soil Strategy for 2030 and the 7th Environment Action Programme (EAP).

European Policy Framework

The EU's commitment to achieving zero net land take by 2050 is embedded in several key policy documents:

- **EU Flagship Initiative “A Resource Efficient Europe” (2011)**, setting the pathway to zero land take by 2050.
- **7th Environment Action Programme (2013)**, emphasizing the integration of environmental considerations into land-use planning.
- **EU Soil Strategy for 2030 (2021)**, encouraging member states to set ambitious national targets by 2023 and contribute to the 2050 net zero land take goal.

These policies are part of the framework that drives the land-saving efforts of Alpine countries, which have adopted similar long-term perspectives, often supplementing EU targets with more specific national or regional objectives.

Land-Saving Targets in Alpine Countries

The report provides a detailed analysis of land-saving targets and challenges across Alpine countries, focusing on Austria, France, Italy, Switzerland, Liechtenstein, Slovenia, and Germany. Expert interviews were conducted to gather insights from both government officials and NGOs, providing a clearer understanding of the practical hurdles these nations face in meeting their targets.

A look back at the development since the enactment of land-saving targets reveals that Alpine countries continue to struggle making significant progress towards achieving the land saving targets they have committed themselves to. In the past, the usual response to failing land-

saving targets was to extend the timelines, with little significant recalibration of spatial and urban planning instruments. The survey, however, has also revealed that the increasing political significance of the issue has recently led to the introduction of new, more comprehensive respectively binding instruments. Tangible effects in quantitative terms however remain to be seen.

Austria

- **Current Targets:** Austria aims to reduce land consumption to 2.5 hectares per day by 2030. The current rate is significantly higher, at approximately 11.5 hectares per day (2018-2020 average).
- **Challenges:** Key challenges include the lack of binding quantitative targets at the regional level, fragmented competences between federal and municipal authorities, and societal preferences for single-family homes, which drive urban sprawl.
- **Effective Measures:** Austria has made strides in designating high-value agricultural land and promoting brownfield development. Initiatives like the "Brownfield Dialogue" aim to raise awareness and develop tools to assess and reuse vacant or underused land.

France

- **Current Targets:** France aims for zero net land take by 2050, with an interim goal of halving land consumption by 2031, based on the average from 2011-2021. The Climate and Resilience Law (2021) enforces these targets.
- **Challenges:** The French land-saving targets face political opposition, which illustrates the vulnerability of long-term environmental targets such as the net-zero target to short-term political shifts. Additionally, the agricultural sector's interest in land preservation conflicts with the economic benefits of land sales.
- **Effective Measures:** France has introduced financial incentives for brownfield regeneration and urban renewal. The Observatory for Soil Artificialisation was established to monitor land take and ensure compliance with national targets.

Germany

- **Current Targets:** Germany has set a national target to reduce land take to less than 30 hectares per day by 2030, with the long-term goal of net-zero land take by 2050.
- **Challenges:** The national respectively federal state land-saving targets are neither obligatory nor regionalised. Besides the municipal planning logic as a function of the municipal revenue and tax system, the strong preference for suburban living continues to drive land consumption.
- **Effective Measures:** Effective measures are seen as an interplay between recalibrated formal instruments, information and awareness-raising as well as funding programmes. Non-governmental initiatives managed to draw attention to the relevance of a consistent spatial planning framework.

Italy

- **Current Targets:** Italian regions have committed to reducing land take, with interim targets and net zero land take envisaged by 2050. At the national level, the adoption of a land-saving target is still pending.
- **Challenges:** Italy struggles with regional disparities in land-saving efforts and a lack of coordination between national and regional planning authorities. Opposing drivers and target conflicts also pose significant challenges.
- **Effective Measures:** Promising approaches include linking land take reduction to related issues such as ecosystem services, climate change adaptation and preservation of farmland. Communication efforts are facilitated through a comprehensive information base elaborated at the national level.

Liechtenstein

- **Current Targets:** Liechtenstein has not adopted a land-saving target but is pursuing a restrictive zoning policy for residential areas, with particular protection for agriculturally productive areas.
- **Challenges:** As a small country with limited land resources, Liechtenstein faces unique challenges in balancing development needs with environmental protection.
- **Effective Measures:** The government has focused on promoting high-density urban development and protecting natural landscapes from further encroachment.

Slovenia

- **Current Targets:** Slovenia adopted land-saving targets, with a reduction pathway to ultimately achieve net zero land take by 2050.
- **Challenges:** Slovenia faces challenges in aligning its land-use policies with land-saving targets, particularly in rural areas where land consumption is driven by agricultural needs.
- **Effective Measures:** High expectations are placed in the EU Soil Health Directive and its implementation steps to promote sustainable land use and reduce urban sprawl.

Switzerland

- **Current Targets:** Switzerland's land-saving strategy is closely tied to its spatial planning laws, which aim to contain urban sprawl and promote higher-density development. Reduction targets are set for the interim period until 2030 and ultimately a net zero land take is envisaged until 2050.
- **Challenges:** The main challenges include the application of existing steering instruments along the different governmental levels. Additional challenges include cultural preferences for low-density housing, land hoarding and exceptions for building outside of building zones.
- **Effective Measures:** The Swiss government has promoted compact urban development and the protection of agricultural land. Revisions of the spatial planning

legal framework are set to encourage demand-oriented zoning, urban densification and the activation of underutilized spaces.

Key Challenges Across Alpine Countries

Several common challenges emerge across the Alpine region, including:

- **Individual factors:** The demand for single-family homes and low-density development as well as sub- and peri-urbanisation remain significant obstacles to reducing land take. Significant land reserves remain untapped.
- **Administrative factors:** The lack of administrative resources, the complexity of planning tools and the high degree of personal relationships particularly at local government level compromise a comprehensive implementation of existing planning instruments and enforcement of regulations.
- **Legal and financial framework:** While national targets exist, many countries lack binding regional or local targets, making it difficult to enforce land-saving measures at all levels of government. The division of land-use planning responsibilities between national, regional, and municipal levels creates difficulties in implementing cohesive land-saving policies. Municipalities often rely on land development for tax revenue, creating a conflict between short-term economic gains and long-term land-saving goals.
- **Concepts and data basis for decision-making:** Often cost transparency, soil data and monitoring are lacking as basis for sound decision-making. Additionally, the comprehensive issue of reducing land take is rarely operationalised in the form of short- or medium-term action plans.

Outlook and Recommendations

The report concludes that achieving zero net land take by 2050 will require stronger coordination between national, regional, and local governments, as well as a shift in societal attitudes towards land use. Approaches to land saving targets can be differentiated into voluntary targets at national level without regionalisation or cap, regionalised land saving targets and regulatory frameworks that limit urbanisation at local level based on binding mechanisms.

Key recommendations include:

- **Binding Regional Targets:** Governments should set binding land-saving targets at the regional and local levels to ensure uniform implementation.
- **Promoting Urban Densification:** Policies should prioritize the development of brownfield sites and the densification of existing urban areas to reduce the need for new land consumption.
- **Public Awareness Campaigns:** Raising public awareness about the environmental and economic benefits of land-saving measures is critical to changing societal preferences for low-density housing.

In conclusion, while Alpine countries have made significant strides in setting land-saving targets, achieving zero net land take by 2050 will require more robust measures, greater coordination, and a cultural shift towards more sustainable land-use practices.

1. BACKGROUND

As a contribution to the Alpine Climate Target System, this survey represents Step 3 of the Spatial Planning Implementation Pathway 1 “Alpine wide concept ‘Spatial Planning for Climate Action’” in the form of a survey on land saving targets and challenges. The first task was to assess which Alpine Convention states/countries have adopted land saving targets or are discussing them. This survey was supplemented with an overview of measures foreseen in the specific documents and the current land take in the Alpine countries and selected regions/federal states/provinces. This part of the study was conducted in the course of the 2021/2022 mandate phase of the Working Group Spatial Planning and Sustainable Development Working Group (SPSD WG). Therefore, the policy framework and land take data presented below at the beginning of each country chapter is reflecting the situation and available data in 2022.

Building on this survey of land-saving targets, the SPSP WG in its 2023/2024 mandate addressed the challenges Alpine Convention states/countries face to reach their quantitative land saving targets. This task included a literature screening and interviews with 13 experts from all Alpine countries¹.

On behalf of the SPSP WG, we want to thank all the experts who have significantly contributed to this report through sharing their country-specific expertise and insights.

2. EUROPEAN POLICY FRAMEWORK

The policy objective to achieve zero net land take by 2050 has been adopted in the following European policy programmes and strategies (Table 1).

Table 1: European policy framework on net zero land take 2050

Document	Adopted by	Date	Reference
Roadmap to a Resource Efficient Europe (COM (2011) 571 final)	European Commission	2011	<i>“By 2020, EU policies take into account their direct and indirect impact on land use in the EU and globally, and the rate of land take is on track with an aim to achieve nonet land take by 2050”</i>
Environment Action Programme to 2020 (7 th Environment Action Programme EAP)	European Parliament and Council	2013	<i>“Environmental considerations [...] should be integrated into planning decisions relating to land use so that they are made more sustainable, with a view [...] towards the objective of ‘no net land take’, by 2050.”</i>
EU Soil Strategy for 2030 (COM (2021) 699 final)	European Commission	2021	<i>“The EU should achieve no net land take by 2050, which will contribute to the net removals target of 2030. To do so, notably Member States should set by 2023 their own ambitious national, regional and local targets to reduce net land take by 2030 in order to make a measurable contribution to the EU target of 2050, and report on progress.”</i>

Over the recent years, this European target has been adopted by most Alpine countries as a long-term perspective in addition to their individual medium-term land saving targets.

¹ Due to its specific condition as a city-state, Monaco was excluded from this study.

3. LAND SAVING TARGETS IN ALPINE COUNTRIES

The following chapters contain a description of the national and selected state-level framework on quantitative land-saving targets. The editorial deadline for compilation was data officially available at the time of the mandate phase 2021/2022 of the Alpine Convention Working Group on Spatial Planning and Sustainable Development.

In the following mandate phase 2023/2024, this desktop research on quantitative land-saving targets was supplemented in the form of a brief literature screening and guideline-based expert interviews on challenges each Alpine country is facing in regard to its land-saving targets. The expert interviews mostly include two perspectives from each Alpine country² – one representing the administrative/government perspective, one the perspective of NGOs/planning associations. A total of 13 interviews have been conducted by ifuplan: two with Austrian, German, Italian, Swiss and Liechtenstein experts and one with a French respectively Slovenian expert.

The information gathered through the expert interviews are summarised in the following subchapters of each country profile:

- Current situation
- Significant steps of the recent past
- Particularly effective approaches
- Challenges (also including aspects identified in the course of a brief literature screening)
- Outlook

It is very important to keep in mind that the information provided by the interview partners represents an individual expert opinion to substantiate and supplement findings of the literature screening. The information provided is in no way representative for the institutions of the interview partners or constitutes a comprehensive depiction of the national situation. The interviews were conducted with the assurance of confidentiality, therefore neither interview partners nor institutions are named in this report.

For better readability, statements provided by administrations and NGOs are not consistently differentiated in the following country profiles.

That being said, the authors would like to underline that the expert interviews proved to be very beneficial, providing expert insights into the current debate and implementation challenges surrounding land-saving targets for individual Alpine countries.

² For France (administrative) and Slovenia (NGO perspective), only one interview could be arranged. An exception is Monaco, which due to its small size and already large share of built-up area has been excluded from the analysis.

Alpine overview of land-saving targets

In 2020, the Alpine Convention Soil Protection Working Group has produced an overview of land-saving targets adopted by the Alpine states or regions (Alpine Convention 2020, see Figure 1). In the meantime, the following targets (red boxes) have been added or inserted to amend the existing targets.

Target		Timeframe	Recent additions
Alpine Convention	-	-	
Austria	2,5 ha/day (intentional target of Federal Government)	2030	
Germany	30 ha/day	2030	Net zero 2050
Bavaria	5 ha/day as benchmark	2030	Land use circular economy (undefined)
France	zero net artificialisation of soils	2050	50% reduction > 10 years (not yet passed)
Auvergne – Rhone Alps			50% reduction by 2027, net zero by 2040
Provence-Alpes-Côte d’Azur			~ 1 ha/day by 2030
Italy			
Lombardy	25% reduction of the forecast of land consumption from 2014	2020	Net zero 2050
	45% reduction	2025	
Piedmont	Max. 3% of existing urbanized area each 5 years	-	Net zero (undefined timeline)
Veneto	40% reduction of the forecast of land consumption	Since 2011	Net zero 2050
Liechtenstein	-	-	
Slovenia	Reduction of net growth of built-up land for 25%	2030	
	Zero net growth of built-up land	2050	
Switzerland	Net zero land take	2050	Land take reduction by 1/3 (2020-2030)
European Union	No net land take	2050	National/regional/local targets by 2023
United Nations	Land Degradation Neutrality	2030	

Source: Alpine Convention, 2020, modified.

Figure 1: Overview of land saving targets in Alpine countries and regions

3.1 Austria

Land saving targets (status 2022)

Target	2.5 ha/day respectively 9 km ² /year until 2030 (Federal Government) Target path to reduce land consumption to a net 2.5 ha/day by 2030 and compensate for additional soil sealing in the medium term by unsealing corresponding areas
Reference documents	Governmental programme 2020-2024 (Republik Österreich 2020:104), Austrian Strategy for Sustainable Development (NSTRAT) (Bundesministerium für Land- und Forstwirtschaft, Umwelt und Wasserwirtschaft 2002), Austrian Strategy for Sustainable Development (ÖSTRAT) (Bundesministerium für Land- und Forstwirtschaft, Umwelt und Wasserwirtschaft 2010), Austrian Spatial Development Concept 2030 (Österreichische Raumordnungskonferenz 2021), Austrian Soil Protection Strategy adopted by the federal states in 202, Austrian Masterplan for Rural Areas (Bundesministerium für Land- und Forstwirtschaft, Umwelt und Wasserwirtschaft 2017:39).

Current land take	11.5 ha/day for 2018-2020 (three years moving average, see Figure 2) ³ , 10.7 ha in 2020
Measures outlined in reference documents	Soft measures, such as recommendations (ÖROK-Recommendations Nr. 56), information, good practices, capacity building, designation of high value agricultural land (e.g. Tyrol) and ecological priority sites, promotion and extension of brownfield development, (re)use of inner-urban potentials. The ÖREK 2030 ⁴ proposes the establishment of an ÖREK-partnership “2.5 ha” to elaborate recommendations for quantitative targets at Länder level and differentiated requirements for different spatial entities. ⁵
Method of quantification	Until 2022 based on the digital cadastral map ⁶ . From 2021 to 2023, a new data model was developed to record land take and sealing. The results include data on land take for various purposes, including settlement and transport purposes as well as leisure and recreational purposes. The model integrates relevant public administrative data from the federal and state governments on land cover and land use.

The 2.5 ha target was already envisaged in the 2002 Austrian Sustainability Strategy, to be reached by 2010. The 2.5 ha goal was reiterated in the Austrian Soil Strategy on October 10th 2021. At the province level, no land saving targets exist in Austria.

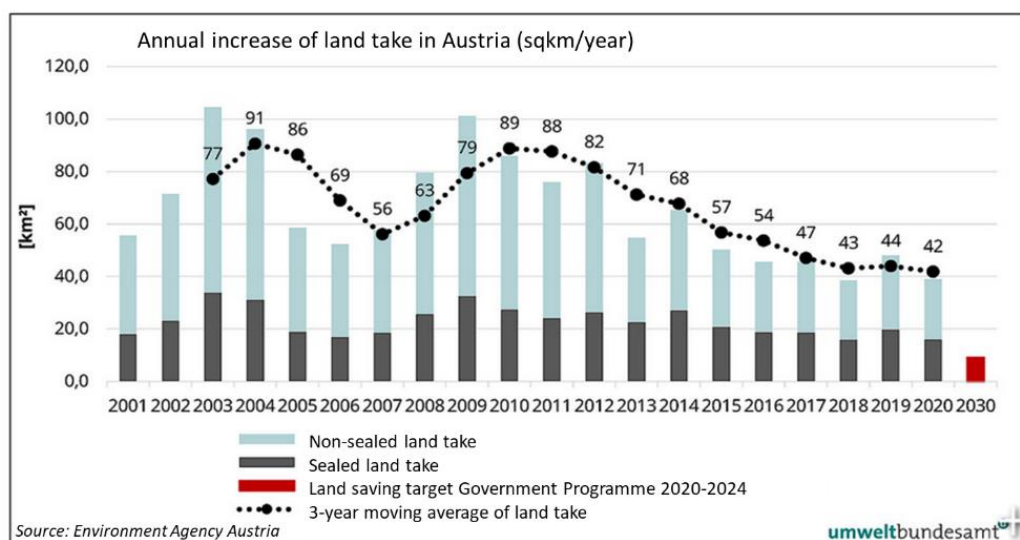


Figure 2: Annual increase in land take in Austria (km²/year)⁷.

³ <https://www.umweltbundesamt.at/umweltthemen/boden/flaecheninanspruchnahme> and indicators Soil Sealing (<https://www.oerok-atlas.at/#indicator/61>) and land reserves <https://www.oerok-atlas.at/#indicator/70> in Austria.

⁴ <https://www.oerek2030.at/>

⁵ For additional proposals, see <https://www.oerek2030.at/kapitel-6/ziel-2>

⁶ „Until 2022, the regional land information database (GDB) of the Federal Office of Metrology and Surveying provided land-related information on specific administrative units (e.g. federal state, district, municipality) and shows, among other things, areas according to types of use (e.g. building land, forest, bodies of water) and uses (e.g. greened building land, paved building land). The regional information is updated when necessary on the basis of changes in the GDB and the digital cadastral map. Due to the deep territorial division (cadastral municipality level), specific evaluations are also possible within the Alpine Convention perimeter.” (Umweltbundesamt 2017:39). For more information about the new monitoring established in 2023, see <https://www.oerok.gv.at/monitoring-flaecheninanspruchnahme>

⁷ Source: <https://www.umweltbundesamt.at/umweltthemen/boden/flaecheninanspruchnahme>

Current situation

Reducing land take is part of the public debate. Due to controversies around its land-saving target the National Soil Strategy was adopted by the Länder in February 2024, which are responsible for spatial planning in Austria, without the federal government. Nevertheless, the federal government, the Länder, cities and municipalities are working together to implement the measures of the strategy. To address current differences in data accuracy among Austrian federal states, the envisaged Soil Strategy also includes data harmonization among federal states.

Significant steps of the recent past

A significant step already adopted by several Austrian federal states is the designation of agricultural areas through ordinances at the federal state levels. Through their designation in a state-wide homogeneous, transparent and binding process, these areas are highly accepted among municipalities and support the economic basis for agricultural enterprises.

In the field of residential land take, housing subsidies – traditionally a huge driver for land take – have been amended in 1996 in the form of a progressive funding policy that promotes land efficiency.

Some federal states such as Tyrol and Upper Austria have strengthened the role of planning and introduced land-saving measures or integrated settlement and public transport development in their respective state planning frameworks. Particularly effective is the delineation of settlement boundaries in spatial development concepts at the municipal level on the basis of population and economic forecasts as well as density assumptions.

At the municipal level, the situation needs to be regionally differentiated: While forerunners are actively addressing the issue in their development plans and are taking steps towards desealing/greening/rezoning, a broader change of perspective is still not detectable.

Funding schemes such as Village Renewal Funds through Neighbourhood Development Schemes (Quartiersentwicklung) or Village Centre Revitalisations (OKR) are providing incentives for a better use of already zones land or reactivation funds for vacant buildings. Through Austrian-wide cooperation of experts, the federal platform “Brachflächen-Dialog”⁸ (“Brownfield-Dialogue”) aims at developing instruments for assessing and reusing brownfields, make best-practice examples visible and raise awareness for the issue as a whole.

At the level of single development projects, spatial planning contracts play a role in reducing the share of sealed surface.

In terms of communication, NGOs are playing a very active role, e.g. in the form of the Landluft⁹ association and its initiative “Boden g’scheit nutzen” (Smart use of land, including competition, book and exhibition).

Challenges

In 2021, the Austrian Conference for Spatial Planning (ÖROK) has taken the decision to draft a “Soil Strategy for Austria” (Österreichische Raumordnungskonferenz 2021b) and listed its

⁸ <https://www.brachflaechen-dialog.at>

⁹ <https://www.landluft.at/>

potential elements (see Table 2). While the decision document does not explicitly address individual challenges and obstacles to meeting land saving targets, the envisaged steps for the soil strategy can be interpreted as remedies for current challenges and shortcomings. The right column of the following table contains the respective interpretation by the authors.

Table 2: Elements of the “Soil strategy for Austria” and interpretation of challenges

Envisaged elements of the “Soil Strategy for Austria” (Österreichische Raumordnungskonferenz 2021b:3)	Interpretation of current challenges and obstacles by the authors
<i>Establishing a harmonised database, [applying] harmonised data collection methods</i>	Lack of a harmonised database and data collection methods on land take and soil consumption
<i>Elaboration of a target system with quantitative national targets and timelines</i>	Lack of binding quantitative targets and timelines for land saving targets at the national level. ¹⁰
<i>The development of federal state level [quantitative, the authors] targets in line with the national targets and in consideration of respective spatial structures.</i>	Lack of quantitative targets at the federal state level, derived from the national quantitative target.
<i>The development of a nationwide consistent monitoring system.</i>	Lack of a consistent monitoring system, impeded by the lack of lower-level quantitative targets (federal states and municipal level).
<i>The identification and further development of particularly effective instruments and measures for an efficient use of existing potentials (inner-urban development and densification, activation of vacancies, brownfield development, mobilising non-built building land) as well as the protection and development of natural areas, open spaces and recreational areas.</i>	Instruments promoting the use of existing potentials and the protection and development of open spaces are either not applied on a broad basis or not sufficiently effective.
<i>An Action Plan with concrete activities, milestones and implementation timelines until 2030.</i>	Lack of a consistent set of measures and responsibilities with a focus on the short- and medium-term perspective.

According to the Austrian Spatial Planning Conference ÖROK, the reasons for the increasing land take lies not so much in large-scale, land-consuming projects but rather in the multitude of incremental individual decisions at the municipal level for housing and commercial projects (Österreichische Raumordnungskonferenz 2017:8f). The continuously high demand is driven by the aspiration for single-family homes that large parts of the population share – irrespective of its consequences on a broader scale. 68% of the population aged 18-39 opt for a single-family home as their preferred form of housing. While being aware of the consequences for spatial development and municipal finances, municipalities feel responsible for enabling these expectations.

¹⁰ Formally, a quantitative target already exists at the national level since 2001 in the form of the 2.5 ha reduction target by 2010, currently prolonged until 2030. Therefore, this objective seems to envisage a more binding character of the target.

Land hoarding

In 2022, 21.1% of the dedicated net building land (excluding road areas) was not built on¹¹ - sometimes over decades (Österreichische Raumordnungskonferenz 2023). The municipalities have little recourse against hoarding of building land. Only recently instruments addressing land hoarding have been established in some federal states, e.g. in the form of levies. Possibly as a consequence, the share of land reserves for Austria as a whole has decreased by 3.8% in the period from 2014 to 2022, but still remains at a high level of over 1/5 of the dedicated land. Building land hoarding is possible because zoning in recent decades has often been carried out without any obligation to realize the project, and there are no levies on undeveloped building land. Strong property rights also severely limit the scope of action of the public sector.

International corporations are also acquiring real estate (land and buildings) as a financial investment, as the increases in value have been extremely high in recent years. In these cases, municipalities are dealing with actors who follow a market logic and have more resources (financial, legal) than municipalities. It is a challenge for municipalities to react to this with suitable instruments (Kanonier 2022).

As a rule, zoning is not linked to implementation obligations, but only specifies a permissible land use. Whether and when a building is used is left to the owner. Municipalities are often in the role of supplicant in the face of building hoarding and have little leverage against hoarding.

Insufficient use of supra-local planning instruments and local implementation

Spatial planning can make more consistent supra-local determinations even without breaking down the savings targets to municipalities (e.g. priority areas for open spaces with different objectives, e.g. agriculture, climate change adaptation, soil protection etc., stricter settlement boundaries, minimum densities for development). However, Getzner & Kadi (2019:1112) come to the conclusion that spatial planning regulations, strategies and concepts have no “[...] statistically significant and discernible effect [...] on land consumption”. The authors attribute this ineffectiveness to the mismatch between ambitious, yet non-binding concepts at the central government level and the broad decision-making competences at the municipal level, casting doubt “...on whether local governments have adapted their way of decision-making to conform with the new policy frameworks” (ibid:1113).

It is comparatively easy to define settlement boundaries and minimum densities (especially in easily accessible locations) or to define agricultural priority zones. In this way, the discretionary scope for municipalities can be sensibly limited without calling into question the planning sovereignty of the municipalities. Major urban sprawl can thus be ruled out. Without such specifications, the entire responsibility lies with the municipalities (Kanonier 2022).

¹¹ <https://www.oerok-atlas.at/#indicator/70>

Lack of binding reduction targets

While quantitative reduction targets have been in place and reiterated at the national level since 2001, they are neither regionalized for federal states, regions or individual municipalities nor is a binding implementation framework in place (WWF Österreich 2021:9).

Closing inner-urban building gaps is statistically accounted as land take, making it unattractive for municipalities at least in regard to quantitative land saving targets.

No uncoupling of GDP and land take

Getzner & Kadi attribute the decline in land take around the global financial crisis (2007/2008) to a slowed increase or even decline in household income (2019:1112). The conclusion is that without changes in land use and zoning policy, land take will return to previous levels once economic difficulties have been overcome, rendering brief declines or dents in the land take rate an unsustainable, short-term phenomena.

Awareness

Social reasons play an important role for land take. Growth has a positive connotation, the single-family home is a status symbol, saving land is seen as a sacrifice (Kanonier 2022).

Inner development requires resources

Activation of inner development potential is difficult for a variety of reasons, and the effort required is greater than for building land development. Municipalities have too few effective and manageable instruments and regulations for mobilizing inner development potential. Small municipalities also lack knowledge and financial and human resources.

Apart from land take for residential and commercial purposes, the land take for transport infrastructure (roads, parking areas) and tourism (e.g. skiing infrastructure) also needs to be taken into consideration.

Fragmentation of competences, exemptions and special provisions

Competences for spatial planning are fragmented between the federal states and municipalities. The legal regulation of spatial planning falls into the competence of the federal states, while municipalities are responsible for zoning (WWF Österreich 2021:10). There are a variety of derogations and special provisions of the Länder for privileged agriculture-related buildings in green zones (Grünland) (Kanonier 2022).

Retail centre developments are lacking coherent provisions e.g. regarding stacked parking lots.

Mobilization of building land and inner urban development is demanding

Mobilization of building land is a key success factor for land saving. In AT, a variety of legal and financial options for action have been developed by the federal states in the last years (e.g. temporary development of building land with a rezoning option, fiscal levies). But mobilization needs resources (financial, personal and know how), which municipalities lack. Greenfield zoning is often faster and easier.

In this context, it is interesting to note the different awareness for land take among Austrian states, where Alpine states with their limited permanent settlement area seem to have a higher

awareness for the issue than non-Alpine states where these limits of land resources are less obvious.

Financial incentives

Municipal financing also depends on the number of inhabitants and the settlement of businesses, supply planning of the municipalities and competition for settlement are the result. The communal tax is one of the few taxes that are raised by the municipalities themselves, creating a mostly unregulated competition among municipalities for business and commercial locations. This topic also includes loosening the perceived positive correlation between land take and job creation.

Business promotion measures at the regional and local level, if not taking sufficient note of land saving aspects or spatial planning provisions, sometimes lead to unintended side effects. This effect is being aggravated by deregulation efforts in regard to the role of spatial planning assessments.

In regard to property taxation, closing the taxation gap between vacant resp. underused properties and properties used according to their capacity is seen as crucial. The commuter tax allowance continues to financially promote and stabilise urban sprawl.

Outlook

Additional future perspectives include a shift of focus towards the existing building stock through activation, transformation and desealing programmes and a debate about the excessive land zoning reserves. A stronger federal engagement and focus on inner-urban development is seen as critical by interview partners. Beyond spatial planning, sector policies and infrastructure such as transport, energy, schools, and hospitals need to be included in land-saving efforts.

3.2 France

Land saving targets (status 2022)

Target	Zero net land take (ZAN=zéro artificialisation nette) by 2050 Half-reduction of land consumption within 10 years after the promulgation of the Climate and Resilience Law compared to the 10 years preceding that date (2021-2031, Climate and Resilience Law)
Reference documents	Biodiversity Plan 2018 (Plan National Biodiversite 2018 (Ministre de la Transition écologique 2018) "Climate and resilience law" passed August 22nd 2021 ¹²
Current land take	23,528 ha (total France incl. DOM) in 2020 (which corresponds to approx. to 54.8 ha/day ¹³) (see Figure 3) ¹⁴

¹² LOI n° 2021-1104 du 22 août 2021 portant lutte contre le dérèglement climatique et renforcement de la résilience face à ses effets <https://www.legifrance.gouv.fr/orf/id/JORFTEXT000043956924?msclkiid=bdb65294c61611ec8ce8db2db18e0d5f>. Four booklets, published by the Ministry of Ecological Transition and Territorial Cohesion, are aimed at all stakeholders, in particular State services and local authorities, responsible for the implementation of the "zero net artificialisation" reform of land (<https://artificialisation.developpement-durable.gouv.fr/fascicules-zan>)

¹³ <https://artificialisation.biodiversitetousvivants.fr/parution-des-donnees-dartificialisation-2009-2019>

¹⁴ The CEREMA dashboard provides data and charts for land take at the national, regional, departmental and intermunicipal cooperation level: [consommation d'espaces NAF 2009-2023 \(cerema.fr\)](https://cerema.fr/consommation-despaces-NAF-2009-2023)

Measures outlined in reference documents	<ul style="list-style-type: none"> • Strict application in urban planning: accurate assessment of new housing needs, priority given to reduction of vacant home, urban renewal, increased density, limitation of urban sprawl. The French Mountain Law (1985, 2018) introduced the principle of urbanisation in continuity. • Financial devices (promoting brownfield regeneration, revitalisation of city centres, ecoconditional aids (Plan Avenir Montagne)) • Soil artificialisation reports at (inter)municipal level are due every three years • Soft measures, such as recommendations, information, good practices, capacity building, e.g. Practical guide to limit land take (Guide pratique pour limiter l'artificialisation des sols) and toolboxes
Method of quantification	Observatory for soil artificialisation ¹⁵ (introduced in 2019)

The French Climate and Resilience Law includes a programmatic dimension, setting a Net Zero Artificialization objective in 2050 and a trajectory to achieve this goal (dividing land take by 2 in the 10 years following the law's promulgation, i.e. by 2031). According to Article 207, the government is expected to report every 5 years on the evaluation of the policy to limit land take, including recommendations on the trajectories in view of the 2050 net zero target and specifying orientations for the decade 2031-2040.

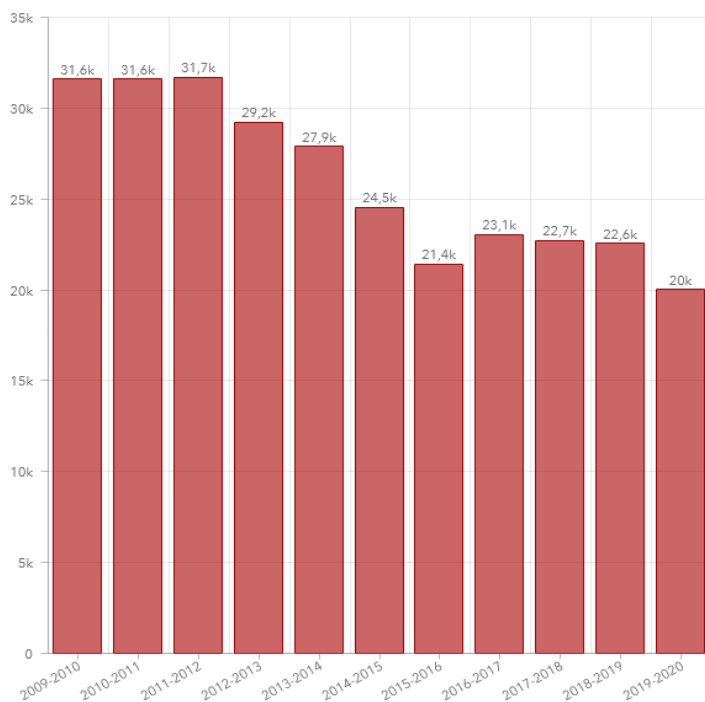
The target and trajectories have to be implemented at each territorial level:

- Regional Planning, Sustainable Development and Equality Scheme (SRADDET) by February 22 2024,
- Intraregional territorial cohesion schemes (SCOT) by 2026
- and Intercommunal Local Urban Plan (PLUi) by 2027

In view of the application of the new "Climate and Resilience Law" and as a basis for policy assessment, a national observatory for soil artificialisation (L'observatoire de l'artificialisation¹⁶) has been launched in 2019.

¹⁵ <https://artificialisation.biodiversitetousvivants.fr/>

¹⁶ <https://artificialisation.developpement-durable.gouv.fr/suivi-consommation-espaces-naf#paragraph--2164>



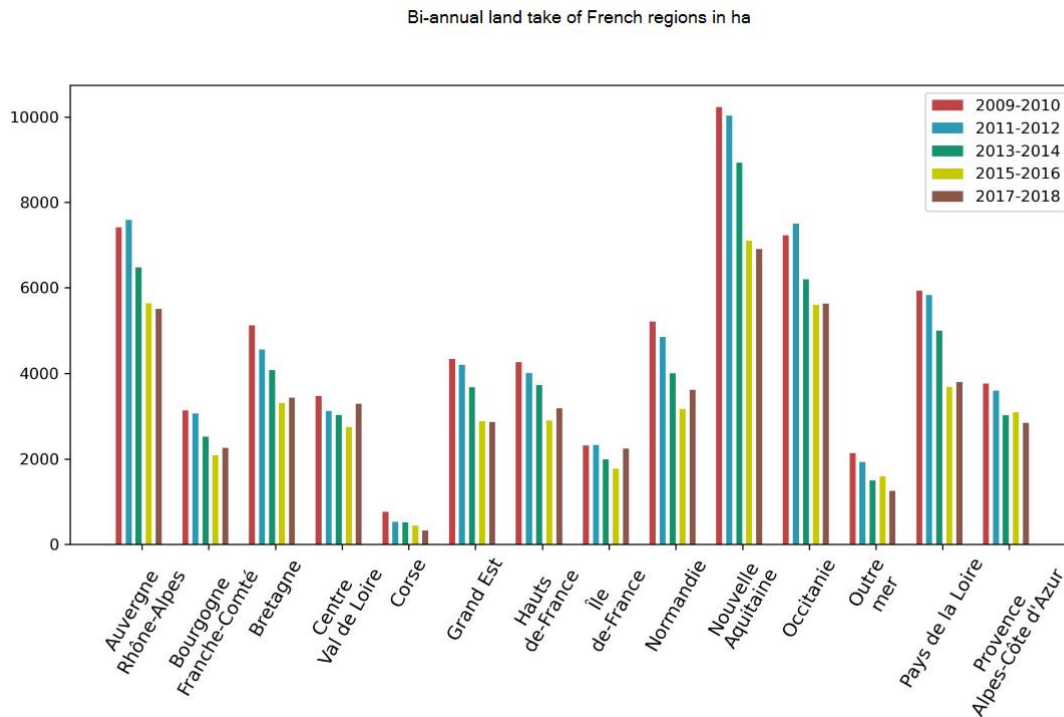
Source: CEREMA l'observatoire de l'artificialisation.

Figure 3: Land take in France (consumption of NAF 2009-2020 in ha)¹⁷

For the French regions (see Figure 4) covering parts of the Alpine Convention perimeter, the current land take is approximately 7.1 ha (Auvergne-Rhone Alpes¹⁸) resp. 2.7 ha (Provence Alpes – Cote d’Azur) (Cerema Hauts-de-France 2020).

¹⁷ <https://kartes.cerema.fr/portal/apps/opsdashboard/index.html#/3feb8bd2b14d449eb03bb3f7fee9d849>

¹⁸ Areas with high land take have been identified in this regional assessment: <https://www.cerema.fr/fr/centre-ressources/newsletters/signature/signature-69-artificialisation-sols-sa-mesure/znieff-i-artificialisation-sols-region-aura>

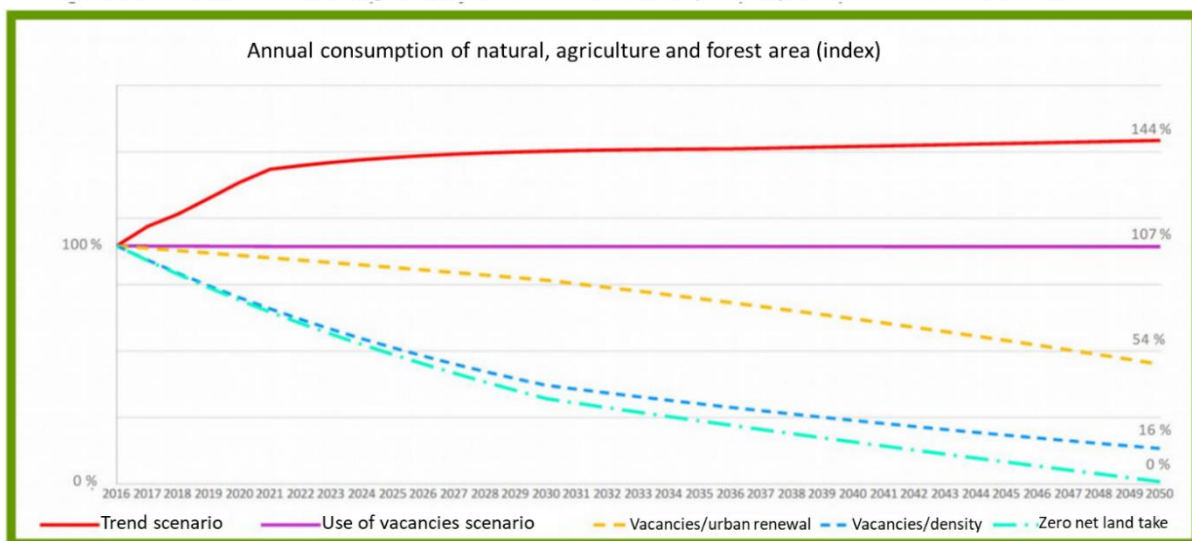


Source: Cerema Hauts-de-France, 2020b:26.

Figure 4: Land take in French regions (including AuRA, PACA)

The French Commissariat Général au Développement Durable (CGDD) has assessed different pathways towards the net zero target (see Figure 5) and concluded that only the ZAN-scenario, combining “reduction of vacancies”, “urban renewal”, “increased density” and “rezoning”, is capable of achieving the zero net land take target (Commissariat Général au Développement Durable 2019).

Illustrative scenarios of natural, agriculture and forest area consumption trajectories for the construction sector

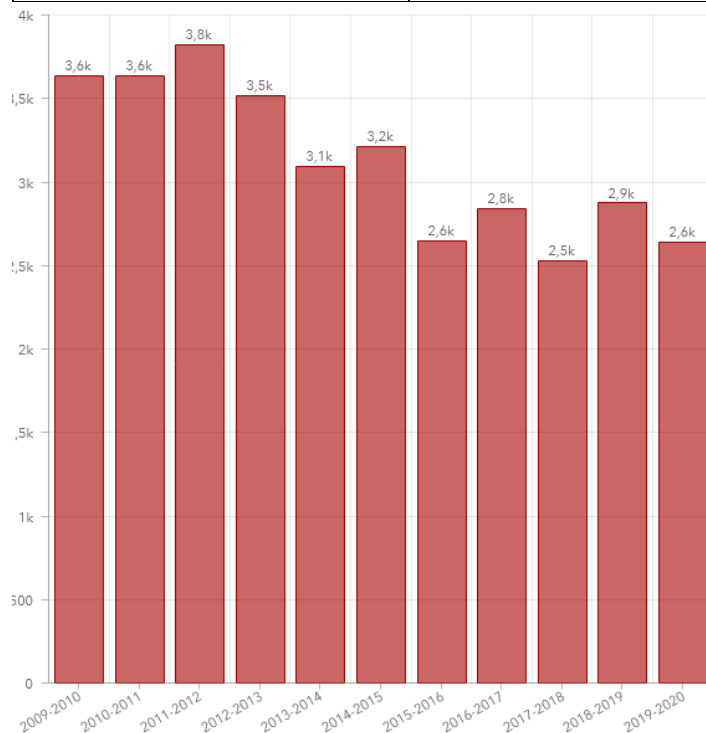


Source: Commissariat Général au Développement Durable, 2019:5.

Figure 5: Land take scenarios in regard to the French net zero target 2050

3.2.1 Region Auvergne-Rhône-Alpes (AuRA)

Target	Net zero land take (ZAN) in 2040 and half reduction of land take by 2027 compared to 2020
Reference document	La stratégie eau - air – sol en Auvergne-Rhône-Alpes (Prefet de la Region Auvergne-Rhone Alpes 2019, 2021)
Current land take	~7.1 ha (see Figure 6)
Measures outlined in reference documents	Stakeholder participation in regard to the zero net land take trajectories Activate financial resource for brownfield development and regeneration Promotion of land strategies and allocation of public lands to municipalities Guideline for renewable energy projects Mobilise tools for agricultural and forestry compensations



Source: CEREMA l'observatoire de l'artificialisation.

Figure 6: Annual land take in the Region Auvergne-Rhône-Alpes (2010-2020, ha)

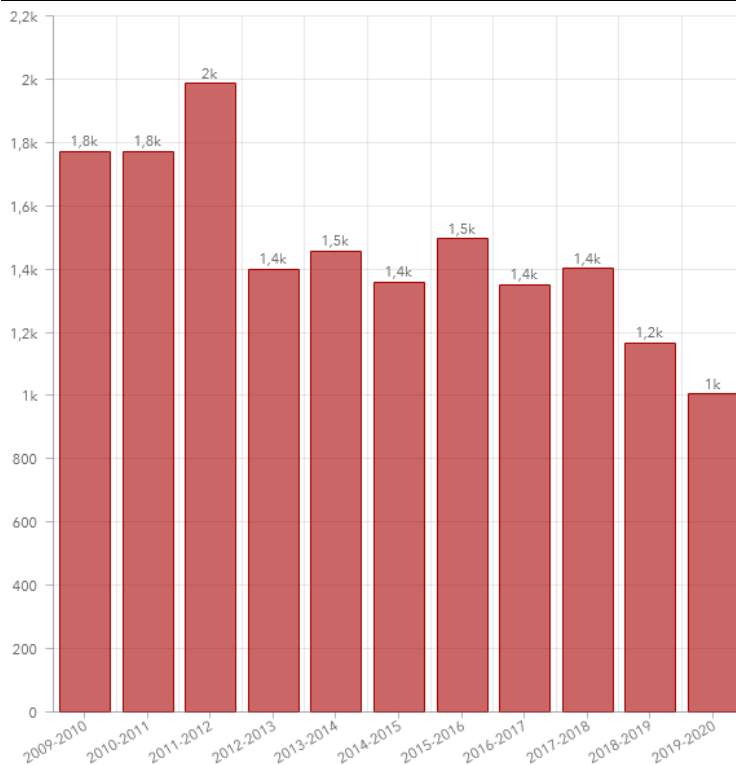
A first evaluation of the Water – Air – Soil – Strategy was published in 2021 (Prefet de la Region Auvergne-Rhone Alpes 2021). For Haute-Savoie, it reported a study commissioned by the Territorial Directorate¹⁹ on water run-off depending on the level of soil sealing. The study proposes a method to identify plots suitable for unsealing. As a follow-up, it is planned to incorporate these results in future planning documents and concrete measures.

¹⁹ <https://www.prefectures-regions.gouv.fr/auvergne-rhone-alpes/Region-et-institutions/L-action-de-l-Etat/Environnement-developpement-durable-et-prevention-des-risques/Eau-air-sol/Sur-le-terrain/Sur-le-terrain/Sol/>

The Auvergne-Rhone Alpes region has introduced the IDfriches programme²⁰ to promote brownfield development and pilot regions on their trajectory towards net zero land take (“Objectif ZAN”, T-ZAN-Territories)²¹.

3.2.2 Region Provence-Alpes-Côte d'Azur (PACA)

Target	Half reduction of land take by 2030 compared to the average annual amount observed between 2006 and 2014.
Reference document	Schéma régional d’aménagement, de développement durable et d’égalité des territoires (SRADDET) de la Région SUD
Current land take	~3.9 ha / day on average (see Figure 7) 14,391 ha between 2010 and 2020.
Measures outlined in reference documents	Target -50% reduction of land take in local urban planning documents (“Schémas de coherence territoriale”) <ul style="list-style-type: none"> Prioritize densification and renewal of existing urban areas and business zones to their extension Protect farming areas, especially if equipped by irrigation facilities Build waste treatment facilities or solar photovoltaic parks on brownfields whenever possible.



Source: CEREMA l'observatoire de l'artificialisation.

Figure 7: Annual land take in the Region Provence-Alpes-Côte d'Azur (2010-2020, ha)

²⁰ <https://www.idfriches-auvergnerhonealpes.fr/presentation-didfriches>

²¹ <https://www.idfriches-auvergnerhonealpes.fr/actualite/ami-zan-vers-des-territoires-zero-artificialisation-nette-trajectoires-et-declinaison>

For the region Provence-Alpes-Côte d'Azur, a steeper decline in land take can be observed when compared to the region Auvergne-Rhône-Alpes (see Figure 6 and Figure 7)). In 2020, the daily land take amounted to 2.7 ha.

As for regional-level actions, the “Regional strategy for a more efficient land-use”²² lists the actions developed by the institution: funding, studies, engineering, partnerships, communications... Moreover, several measures of the regional “Plan Climat 2”²³ promote reduction of land-take target and confirm those of the Schéma régional d'aménagement, de Développement durable et d'égalité des territoires (SRADDET)²⁴.

This “Schéma” will be updated before 2024 to consider the latest French environmental legislation (loi “Climat et Résilience”), especially the territorialization of reduction of land-take targets at an infra-regional level. Concertation will be led with all concerned local actors.

In 2022, the PACA region has adopted a 2021-2024 Roadmap “Accompanying territories to reconcile development and land saving” (Prefet de la Région Provence-Alpes-Côte d'Azur 2022), launching 20 actions.

Current situation

In recent times, France is experiencing strong opposition against the net-zero land take target in the context of shifts towards the political right. Promoters of the long-term issue perceive it to be very vulnerable to short-term shifts of political majorities and respective political priorities. Efforts to reduce land take have not been successful enough to include the agricultural sector due to diverging interests (preserving arable land as production factor for agriculture versus profits from land sales).

In regard to renewable energies, wind farms as well as ground-mounted solar panels (with a minimum height allowing agricultural use) are not statistically counted as land take.²⁵ Currently, a database is being established for France containing solar panels that are compliant with these criteria.

By law²⁶, land take for measures of major public interest (national or European measures e.g. in the transport, energy, industry (e.g. battery giga-factories), military sectors) are only accounted at the national, not the municipal level. For the decade 2021-2031, a lump sum of 12,500 ha has been determined for these projects of major public interest, of which 10,000 ha are subject to equalization between regions.

²² <https://connaissance-territoire.maregionsud.fr/sraddet-avenir-de-nos-territoires/la-mise-en-oeuvre/les-guides-de-mise-en-oeuvre-du-sraddet/details-des-documents-ressources/fiche/strategie-regionale-pour-une-gestion-plus-efficiente-du-foncier-en-provence-alpes-cote-dazur/>

²³ <https://www.maregionsud.fr/a-la-une/plan-climat-gardons-une-cop-davance>

²⁴ <https://connaissance-territoire.maregionsud.fr/sraddet-avenir-de-nos-territoires/le-schema-regional/>

²⁵ <https://www.legifrance.gouv.fr/jorf/id/JORFTEXT000048736409>

²⁶

<https://www.legifrance.gouv.fr/jorf/id/JORFTEXT000049676333#:~:text=et%20forestiers%20...-Arr%C3%AAt%C3%A9%20du%2031%20mai%202024%20relatif%20%C3%A0%20la%20mutualisation%20nationale,europ%C3%A9enne%20d%27int%C3%A9r%C3%AAt%20g%C3%A9n%C3%A9ral%20majeur&text=Publics%20concern%C3%A9s%20%3A%20Etat%2C%20collectivit%C3%A9s%20territoriales,%C3%A9tablissements%20publics%2C%20ma%C3%AEtres%20d%27ouvrages>

Significant steps of the recent past

The pivotal achievement of the recent past is the legal obligation incorporated in the Climate Resilience Law to achieve net zero land take by 2050 and a mid-term target of halving the rate of land take for the period of 2021 to 2031 compared to the previous decade 2011-2021. The bottom-up initiative came from a 2021 national citizen council process and a respective policy recommendation²⁷ that was taken up by the French Prime Minister and included in the French Climate Resilience Law. The mandatory mid-term target needs to be integrated into the regional planning documents by 2024, into county (intercity) planning documents by 2026 and into municipal planning documents by 2028. The target needs to be met at the regional level as a whole, but a flexibility exists how to allocate land use within regions between areas with high and low urbanization pressures.

In respect to funding, the establishment of a national green fund (Fonds vert²⁸) in 2022 represents another achievement, providing significant funding opportunities for brownfield recycling (300 Mio € annually, target is activation of > 1000 ha brownfields per year) and renaturalisation within cities and villages (100 Mio. € annually, target is several 100 ha per year). The challenge will be to maintain funding for the Fonds vert over time. Options in this regard include reforms of the tax system.

Awareness-raising activities have been stepped up at the national level, including a half-day e-learning course “Cap sur le ZAN²⁹” for public servants working at the national level about the importance of reducing land take as well as inspirational videos³⁰ and an architectural exhibition addressing preconceived ideas and prejudices about the negative effects of reducing land take through illustrations and pictures of attractive land-saving examples.

Particularly effective approaches

The uptake of a land saving target (Net-0 2050 and halving mid-term target) in the legal framework of the Climate Resilience Law is potentially a game-changing step in the sense that - if followed through - it provides a binding force and long-lasting effects that awareness-raising activities and incentives cannot deliver.

Challenges

Continued suburbanisation of businesses and households

According to La Fabrique Ecologique 2021, the impact on artificialisation by economic ‘large objects’ such as shopping malls or logistics terminals that consume large amounts of space is poorly understood. However, it is apparent that logistic warehouses that were traditionally located at the fringes of the dense agglomeration, or even at their heart when they were linked to rail networks, have in recent decades been relocated to suburban and peri-urban areas, thus moving closer to networks, motorway nodes and major intermodal hubs, including airports. These locations offer real estate at low-cost but consume significant farmland.

²⁷ <https://www.conventioncitoyennepourleclimat.fr/>

²⁸ <https://www.ecologie.gouv.fr/fonds-vert>

²⁹ https://www.cmvrh.developpement-durable.gouv.fr/nouvelle-e-formation-sur-mentor-cap-sur-le-zan-a4593.html?lang=fr#H_Public-et-Objectifs-vises

³⁰ E.g. Cerema-instrument addressing land take : <https://www.youtube.com/watch?v=SCTy0hWOn0c>, [MOOC ZAN] The Agglopolys PLUi, a planning initiative committed to reducing land use: <https://www.dailymotion.com/video/x8zmkqg>

Economic activities conducted by companies, and transport infrastructure are a significant component of the urban footprint, and their location has a direct impact on land consumption and greenhouse gas emissions.” (INRAE & IFSTTAR 2017: Artificialised land and artificialisation processes: determinants, impacts and levers for action, p. 7³¹)

In large metropolises and urban areas, households are moving to the outskirts because land and real estate prices are generally decreasing with increasing distance from the centres. This low price compensates for the higher transportation costs for locations farther from the places of employment. The differences in taxation that exist between the centre of a town and its peripheral municipalities, as well as the guidelines defined by urban planning documents in terms of urban sprawl, can encourage the establishment of large commercial complexes on the outskirts. In addition, property developers or public planners, because of land prices, construction costs and regulatory rigidities, may be encouraged to build on the outskirts in a low-density manner.

Tax system with counterproductive effects on land saving

“Experience has shown that land artificialisation, especially on agricultural land, has been largely immune from the fiscal and planning tools developed by public authorities since the 1980s. Despite many laws and regulations, economical land use remains an elusive goal at the national level. Although the available legal tools may potentially limit land artificialisation, their implementation varies from one region to another and is globally limited” (INRAE & IFSTTAR 2017:7).

The public authorities also mobilize a particularly extensive tax framework, with nearly thirty taxes applying to developable land. These taxes are important sources of funding for local authorities, with property tax accounting for a total of 41 billion euros in 2017, compared with 22.5 billion euros for the housing tax and 945 million euros for the tax on commercial surfaces. It is nevertheless very difficult to measure the effects of each of these tools on local dynamics of artificialization. These tax measures were not designed to address the issue of reducing land artificialisation (La Fabrique Ecologique 2021). “Incentivizing approaches are rare: taxation on land and buildings in France is generally favourable to land take and does not encourage land use efficiency (Sainteny, 2018). The few existing mechanisms (payments for low density, taxation of wasteland and vacant buildings) are not used much, because they run counter to the political interest of local authorities wishing to urbanize.” (Colsaet. 2019, p. 4)

Higher notary fees for old properties

Notary fees are not the same for new and old properties, creating a counter-productive incentive to the disadvantage of reactivating vacancies. For example, in old buildings, notary fees amount to approximately 7 or 8% of the value of the property for sale. In the case of a new property, these acquisition costs amount to 3 or 4% of the sale price. (La Fabrique Ecologique 2021). This disadvantage adds to the financial risks of re-using buildings or activating vacancies, e.g. in the form of unclear building conditions and insufficient energetic standards.

³¹ <https://www.inrae.fr/en/news/artificialised-land-and-artificialisation-processes>

Conflict between land efficiency goals and the competition between local authorities

“Competition between local authorities to attract inhabitants and new businesses is a powerful pressure that conflicts with the goal of land use efficiency (Colsaet et al., 2018). However, strategic planning tools, in particular SCoTs, even if they are increasingly improving their integration of land use, remain instruments of coordination between local actors. As highlighted by the recent French parliamentary commission into agricultural land, “[SCoTs] depend on the goodwill of local elected representatives. Many people interviewed said they are not sufficiently prescriptive” (National Assembly, 2018). Strengthening the role of SCoTs will not overcome this issue, at least if they are not complemented by larger scale control or incentive mechanisms, for example at the regional level (where future Regional Planning, Sustainable Development and Equality Schemes [SRADDET] could play a role).” (Colsaet 2019, p.4)

High vacancy rates

Vacancy rates in France are high compared to other Western countries. Over the period 2010-2015, the housing vacancy rate increased by 3.4% per year, reaching 3.1 million dwellings or 8.5% of the housing stock, compared to 4% in Germany, 3% in the UK and 1.7% in Switzerland. Housing vacancy is now accounting for 23% of the additional housing stock. Structural vacancy corresponds to 1 million dwellings, of which 300,000 are in areas with tense housing conditions (shortages). It is more marked in the central cities and less in the outskirts. It is also less prevalent in the urban areas of regional metropolises, particularly those where the property market is tight. (La Fabrique Ecologique 2021)

As far as commercial vacancy is concerned, it does not affect all town centres in a uniform manner. Small and medium-sized towns and the heart of urban areas with fewer than 50,000 inhabitants are more affected by this phenomenon. In 2015, the national average vacancy rate for commercial premises was 9.5%. Vacancy rose from 9.3% to 11.1% between 2014 and 2015 in these municipalities. For agglomerations with 50,000 to 100,000 inhabitants, it rose from 10.3% to 11.3% and for those with 100,000 to 250,000 inhabitants from 8.7% to 9.2%. The level of vacancy is maintained at 6% in the heart of conurbations with more than 500,000 inhabitants. This phenomenon is likely to be amplified by the Covid-19 crisis. (La Fabrique Ecologique 2021)

Resources for inner-urban and brownfield development

Achieving ZAN requires densification and the activation of brownfield sites. These two means were already mentioned in the “Solidarity and Urban Renewal” Act of 2000. The obstacles they face are the same: the difficulty and resources necessary establish a brownfield cadastre and the potentially costly task of bringing these sites back onto the market.

This raises questions about engineering, even though local authorities can call on the support of public land establishments, town planning agencies, Cerema, Ademe, departmental land offices and private consultancies. For decision-makers at local level, greenfield development remains the easiest way to develop, while inner-urban development requires more expertise and poses a multitude of technical challenges and additional effort. In France with its 36.000 municipalities, capacity building at lower government level in rural areas is particularly challenging.

"Engineering is a major challenge, particularly for rural areas", stresses Michel Heinrich, Chairman of the Fédération nationale des schémas de cohérence territoriale. However, given "the time constraints set by the law", he fears overheating: "All engineering capacities are going to be called upon...".³²

Secondary homes

France has 3.3 million secondary or occasional residences, representing 9.5% of the housing stock in 2015. The share of secondary and occasional residences accounted for 11% of the growth in the housing stock over the period 2010-2015. (La Fabrique Ecologique 2021)

Significant price differences between agricultural and urbanisation land

Compared to agricultural uses, significant incentives exist for landowners to rezone their land to building land and sell it for non-agricultural use. In fact, the value of a hectare of farmland in France is among the lowest in Western Europe (La Fabrique Ecologique 2021). The acceptance for necessary tax reforms at the local level is assessed to be difficult, for fears of foregoing revenues.

Growth in housing demand / housing preferences

There is a growth in housing demand linked to the conjunction of three complementary phenomena: population growth, decrease of household size and the preference for individual housing.

In addition to population growth, the change in household structure is an important factor in explaining the dynamics of artificialization. Some explanatory factors are indeed noteworthy (following paragraph according to La Fabrique Ecologique 2021):

- The increase in the average living space per person linked to the rise in living standards;
- The decrease in the average size of households linked to the aging of the population, the decrease in fertility and more frequent separations;
- When the formation of a household is accompanied by a loss of income (separation, retirement), the small dwellings that are available in the city centres are not financially accessible.

The preference of the French for individual housing is a fairly strong underlying trend. Peri-urbanisation is not just an overflow of the concentration of large urban areas and should no longer be read solely as a 'default' choice for households unable to access urban centres for economic reasons. It is a positive choice, based on the search for newer individual housing and increased contact with nature. (La Fabrique Ecologique 2021).

In a broader context, a cultural change seems necessary, overcoming the prevailing belief that economic and social development equals land consumption. "On the one hand, artificialisation appears to be encouraged in order to meet economic and social needs as well as the goal of local development, while on the other hand, the mechanisms to control land-use change in most cases lack binding force. This fundamental contradiction must be solved in order that the

³² <https://www.lagazettedescommunes.com/851808/les-friches-et-les-logements-vides-mines-dor-du-zan/> (27.06.2023)

policy of limitation of the artificialisation of land, as has been committed to, is effective" (INRAE & IFSTTAR 2017:7).

Inner-urban development and land-saving efforts need to be understood as approaches to address structural problems and widespread vacancies within villages (see Action cœur de ville).

Deficit of implementation and monitoring

Colsaet (2019:4) comes to the conclusion that "France does not lack regulatory means to limit land take, but the measures at its disposal are not used enough or are insufficiently restrictive. There is also the issue of the available means for implementation and control, particularly within the State services responsible for verifying that planning documents comply with the law."

Regulations for securing open space difficult to implement

Protection schemes for open space (e.g. French Mountain law) and agricultural land (e.g. protected agricultural zones since 1999) may limit the power of local authorities to implement urbanization plans: "In 2018, there were 135,000 hectares protected by these two instruments (CGAAER, 2018), or 0.5% of the mainland agricultural area. They have real effectiveness locally, but their creation is often long and complicated. Moreover, the use of these devices is highly focused in certain regions (Auvergne-Rhône Alpes)" (Colsaet 2019, p. 3).

Desealing is cost-intensive

On a technical level, "de-artificialization" raises issues: land restoration, the depollution and reclaiming of land is expensive. While some experiments exist today, the economic model on which such operations would be based has yet to be developed. Similarly, land take can only be limited by increasing urban densification, which is also more expensive than "open field" construction. We therefore need to consider how to make densification an attractive option for more and more territories" (Colsaet 2019, p. 4).

Outlook

As next steps, the interview partner sees the necessity to ensure legislative stability, as laws and regulations addressing land take represent a long-game that is vulnerable to constant shifts of political priorities. To cap excessive profits in the real estate market, particularly in the context of price hikes due to zoning, a fiscal reform seems necessary.

The path France has taken to legally enshrine land take reduction targets in national law and consequently lower planning levels is increasingly being challenged domestically. Reference is being made to neighbouring countries that take a more laissez-faire, voluntary approach to the issue with non-binding and not regionalised quantitative targets (e.g. Germany, Austria). To establish a level playing field and to avoid competitive conditions between Alpine states, it is deemed desirable to provide a consistent framework among European countries, specifically within the Alpine Convention, with comparable legal status and ambitions of land take reduction targets.

3.3 Germany

Land-saving targets (status in 2022)

Target	30 ha/day minus X until 2030; net zero land take by 2050
Reference document	Sustainable development strategy (Deutsche Bundesregierung 2018) → 30 ha target Climate Protection Plan 2050 (Bundesministerium für Umwelt, Naturschutz und nukleare Sicherheit 2016:68) → net zero target resp. circular land use economy 2050
Current land take	52 ha/day in 2019 as well as again in 2022 (four-years moving average) ³³
Measures outlined in reference documents	Soft measures, such as recommendations, information, good practices, capacity building, e.g. https://aktion-flaeche.de/
Method of quantification	Official Real Estate Cadastre Information System (Amtliches Liegenschaftskatasterinformationssystem ALKIS) which presents the current land use, e.g. agricultural land, which is already dedicated as building land is not registered as settlement/transport area.

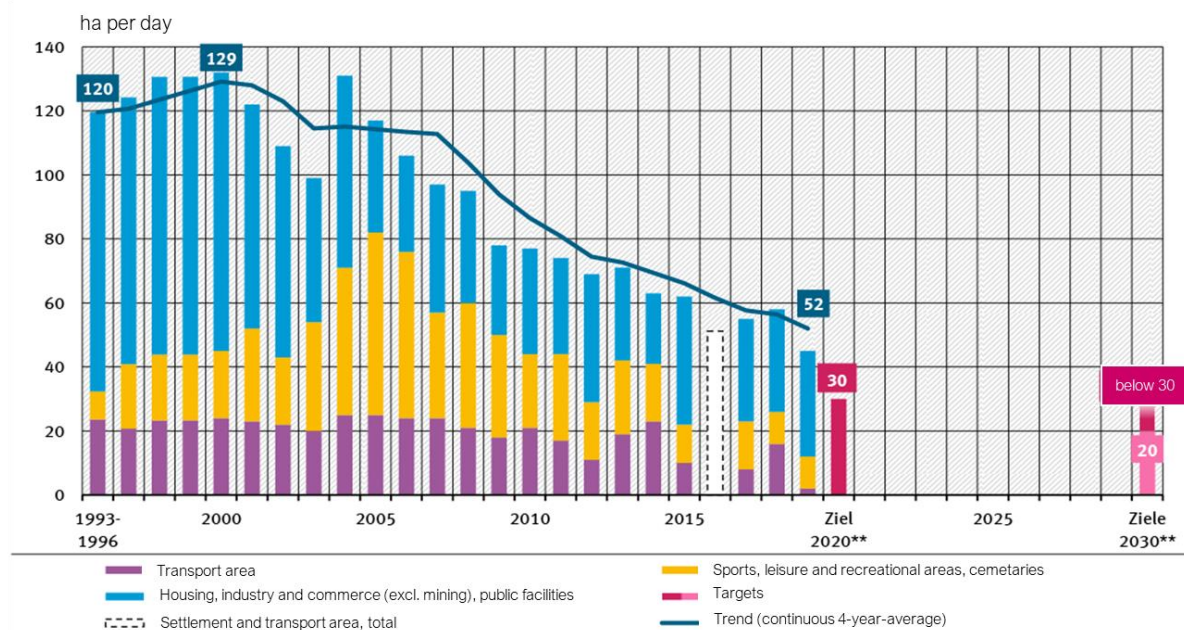
The 30 ha target dates back to the 2001 version of the German Sustainability Strategy, to be reached by 2020. Once it became likely that the target will be missed, the timeframe has been extended by 10 years until 2030, adding the goal to undercut the target by an undefined measure, hence the “minus x”. In the Integrated Environmental Programme 2030, the German Environmental Ministry envisaged a stricter target of 20 ha by 2030 (Bundesministerium für Umwelt, Naturschutz, Bau und Reaktorsicherheit 2016:82). On this target, however, there is no interministerial consensus at federal level in Germany.

Figure 8 illustrates that while reducing land take significantly since the turn of the century, achieving the 2030 targets still poses a challenge for Germany. In regard to monitoring land take, it is interesting to note that Germany (as well as other countries such as Austria³⁴) have also quantitatively assessed inner-urban development potentials, concluding a total extent of 84.000 ha for Germany respectively 10 m² innerurban-development potential per resident (Bundesinstitut für Bau-, Stadt- und Raumforschung 2022:14).

³³ <https://www.umweltbundesamt.de/daten/umweltindikatoren/indikator-siedlungs-verkehrsflaeche> and <https://www.bmuv.de/themen/nachhaltigkeit/strategie-und-umsetzung/reduzierung-des-flaechenverbrauchs>

³⁴ <https://www.oerok-atlas.at/#indicator/70>

Increase in settlement and transport area (SuV)



Source: German Environment Agency (modified), data: Federal Statistical Office.

Figure 8: Annual increase in land take in Germany since 1993

3.3.1 Bavaria

Land-saving targets (status in 2022)

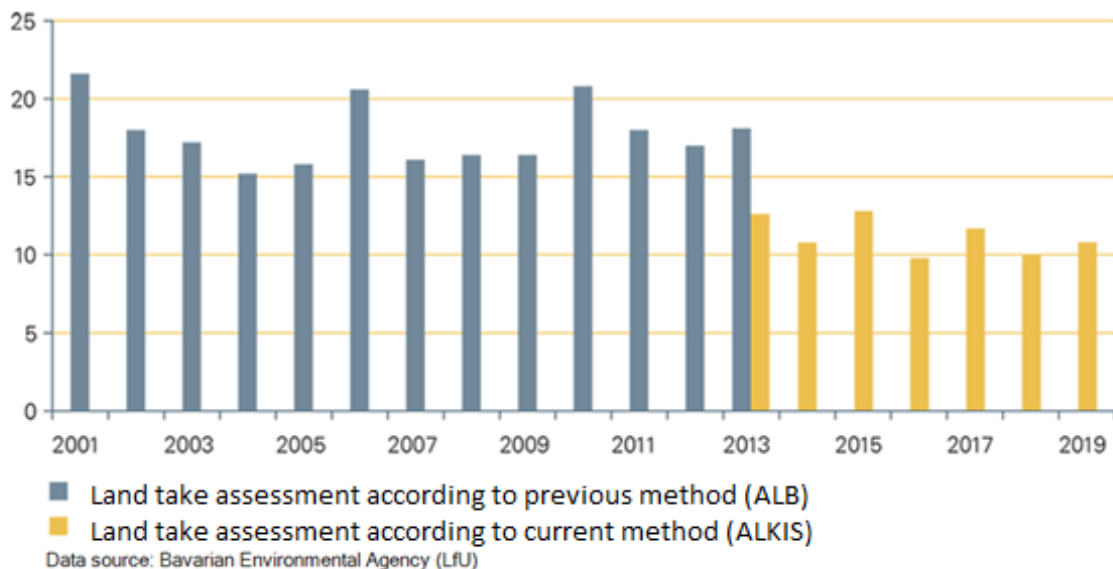
Benchmark	5 ha/day until 2030 and in a long-term perspective circular land use avoiding new land take.
Reference document	Bavarian State Planning Act (Bayerisches Landesplanungsgesetz BayLPIG) ³⁵ , Art. 6 Principles, Bavarian Sustainability Strategy 2013
Current land take	11.6 ha/day in 2020
Measures outlined in reference documents	Recommendations, information, good practices, capacity building (land saving focal points at regional governments), but also legal implementation in the form of the revised Bavarian State Development Programme (LEP) and the adoption of a 2030 benchmark in the Bavarian Spatial Planning Act. Activities are currently bundled in the Bavarian land saving campaign (Flächensparoffensive, Bayerische Staatsregierung 2020)
Method of quantification	Official Real Estate Cadastre Information System (Amtliches Liegenschaftskatasterinformationssystem ALKIS) merging real estate cadastral data of the digital cadastral map (DFK) and the automated land register (ALB), into one system and supplementing them by new data sets, such as the actual use, soil estimation, 3D building data, etc. The Bavarian land take statistic ("Amtliche Flächenstatistik") is based on ALKIS actual land use.

As implementation measure, all Bavarian municipalities are obliged by the State Government to carry out a demand assessment when zoning out new plots. This assessment is to be based

³⁵ <https://www.verkuendung-bayern.de/gvbl/2020-675/>

on demographic development, structural spatial criteria, economic development dynamics, settlement structure development goals, and existing inner development potentials.³⁶

Unlike for Germany as a whole, land take remains at a high level in Bavaria, partly due to its economic dynamic and population growth (see Figure 9). The sudden drop in land take between 2013 and 2014 is due to a statistical recoding of land use, not to a factual sudden decrease in land take.



Source: https://www.lfu.bayern.de/umweltdaten/indikatoren/ressourcen_effizienz/flaechenverbrauch/index.htm

Figure 9: Land take in Bavaria

Current situation

From the governmental perspective, the main drivers for land take include demographic and economic growth as well as the expansion of renewable energies. The level of land take experienced only slight fluctuations over the last years, stably remaining above 10 ha daily land take. To reduce conflicts arising from the continues pressure on land, public policies pursue the objective of an efficient and multifunctional planning.

From the NGO perspective, the relevance of the issues in public debate has dropped recently. Influencing factors include a tense real estate market that influences land take rates more than quantitative land saving targets. Housing shortages dominate the debate, with little regard to a regional differentiation. A slow shift away from the dominance of single-family homes as preferred form of housing can be detected in rural areas, driven more by financial considerations than for ecological reasons. Currently, the political environment is seen unfavourable for concrete policy measures in the environmental sector as public agencies are reluctant to interfere with municipal planning competences and NGOs are shying away from political headwinds. In a communicative sense, land take as an environmental problem is more

³⁶ Interpretation guideline on demand assessment, see https://www.landesentwicklung-bayern.de/fileadmin/user_upload/landesentwicklung/Dokumente/Flaechensparoffensive/AuslegungshilfeBedarfsnachweis_Stand092021.pdf

difficult to communicate than biodiversity (see successful Species Protection Referendum in Bavaria).

Significant steps in the recent past

In 2019, the coalition treaty of the newly formed Bavarian government coalition included an orientation value of reducing land take to 5 ha or less by 2030. Subsequently, this orientation value was incorporated in the Bavarian State Spatial Planning Act on February 1st 2021. The partial update of the Bavarian State Development Programme in June 2023 placed one of its three thematic foci on sustainable land use, including sharpening of the already existing planning principle of connecting new urbanisation to existing one (= Anbindegebot).

As part of the state-wide land-saving initiative (“Flächensparoffensive”), the position of land-saving managers was established at each of the seven Bavarian regional governments whose task is to promote land-saving activities and create awareness among stakeholders, foremost the municipal level. Additional activities of the offensive include events and campaigns, including an annual state-wide month of events (“Month of Land Saving”) that bundles efforts from various governmental departments.

In the non-governmental sphere, planning related associations as well as NGOs joined to form a broad alliance (“Wege zu einem besseren LEP”) calling for more effective measures to reduce land take and strengthening sustainability and transformation issues in the Bavarian State Development Programme as a whole.

Particularly effective approaches

Particularly effective approaches from the governmental perspective include the interplay of

- formal instruments (specifications promoting compact settlement structures) in the Building Act and the State Development Programme);
- information and awareness-raising through a wide range of activities;
- and various funding programmes (including urban renewal funding or regional management with special funds for land-saving efforts).

The efforts combined have increased the population’s awareness for the need to conserve finite land resource.

From the NGO perspective, the debate and concerted opposition from planning associations and NGOs about a briefly established softening of the long-standing planning principle of tying new development to existing infrastructure (= Anbindegebot) managed to draw public attention and effectively raised awareness about the relevance of a consistent spatial planning framework.

Challenges

Bavaria is one of the most dynamic economic regions in Germany, experiencing economic and migration-based population growth despite low natural population growth rates. In turn, these growth effects and target conflicts in the context of housing policies, regional development and energy transition lead to residential, commercial and infrastructural investments with negative effects on land take. However, beyond this growth-driven land take, there is an undercurrent of challenges for quantitative land-saving efforts that prevail irrespective of economic growth

or decline – illustrated through the fact that land take rates far exceed population growth rates in Bavaria also for the recent past (BayStMUV 2022) and Bavaria featuring the third-highest annual per-capita land take among German Federal States (BayStMUV 2022).

Municipal planning logic

The implementation of land policy goals with a focus on land saving has so far often failed due to their incompatibility with other municipal goals, such as raising the profile of a municipality as a residential location or attracting businesses (BayStMUV 2022). A general awareness about the importance of soil protection and benefits of land-saving are partly materialising at a higher spatial level, while possible downside effects such as forgone tax revenues and tense housing markets are perceived at the local level. As long as these conflicting goals exist and, for example, in shrinking municipalities the increase in newly developed land for housing and commerce is seen as an investment in the future, the reduction of local land consumption is pushed into the background as a goal. The economical use of land is a planning objective that is weighed up against other objectives (including settlement, economic and infrastructure development) and consequently prevails only to a limited extent. Municipalities often practice supply planning instead of demand-oriented planning (Umweltbundesamt 2018), rarely taking fully into account the follow-up costs.

Since the municipalities do not have to fulfil any binding land-saving requirements, in many cases the municipal policy actors concerned cannot be expected to weigh up the conflicts of objectives that arise in favour of the land-saving goals. They are often called upon to open up new perspectives for their cities or municipalities in the short term and to create additional scope for housing and commerce, thus gaining an advantage in a competitive environment among municipalities (BayStMUV 2022). They have the mandate to act in the interest of the municipality or the electorate, and they must decide in such a way that they remain "electable". In contrast, long-term, forward-looking action in the sense of saving land requires not only intensive local political debate but also suitable framework conditions and incentives. (UBA 2018)

National and state land use targets are neither obligatory nor regionalized

National and regional land use targets are not regionalized by law, even if such suggestions exist (e.g. Kommunalen Flächenrechner Umweltbundesamt). Municipal associations, such as the Bayerischer Gemeindetag (Association of Bavarian Municipalities), oppose regionalized compulsory or guideline values for land consumption and refer to their municipal planning sovereignty. The experience with non-binding land take reduction targets (30 ha by 2020) suggests that once missed, policy responses are not consequential.

If one considers these framework conditions and the action logics of the municipalities, the definition of binding quantitative and qualitative targets at the regional and municipal level would constitute an important framework to reduce counterproductive municipal policies. This means that one instrument or a bundle of instruments - detached from binding targets - will not help to achieve the land policy goals. The municipalities already have a comprehensive toolbox at their disposal, which alone appears to be insufficient to achieve the land saving objectives at a broader level. Rather, the German Environmental Agency argues that operationalised quantitative and qualitative land policy goals could potentially be crucial steps towards effectively implementing sustainable land saving strategies (Umweltbundesamt 2018:77ff).

Municipal revenue system and taxes

The municipal revenue system is linked to population numbers and jobs. This leads to competition for the attraction of commercial enterprises and immigration of (younger) population groups. (UBA 2018).

There is no taxation of the building gap or planning profit levy by the municipality when building land is created. There is no levy to mobilise building land.

On the other hand, there are no tax advantages for the activation of inner areas: for example, farmsteads in inner areas are taxed when they are converted into residential buildings, as if farm assets were transferred to private assets. (Bayerischer Gemeindetag 2019)

Societal challenges

The economic growth model prevails in society. Saving land is perceived as renunciation. For large parts of the population, single-family homes remain the aspired form of housing, and the size of the plot is considered a status symbol (Umweltbundesamt 2018, Bayerische Akademie Ländlicher Raum 2019). This translates statistically to an ever growing per-capita residential area of currently 49 m² (BayStMWi 2023). Therefore, a change in awareness among the population remains a key challenge.

Insufficient information about available land potentials and lack of obligation to provide evidence of need

In Germany, there is no overview of undeveloped but dedicated building land, neither at national nor at regional level. Municipalities can maintain building land registers on a voluntary basis and record inner development potentials, but this information is not automatically transmitted to higher-level planning bodies (Umweltbundesamt 2018). However, there are projections from a building land survey in the form of a representative sample of building land and inner development potentials in which 692 cities and municipalities participated. The survey estimates the potentially buildable land in German cities and municipalities to amount to at least 99,000 hectares. According to the municipalities, about two-thirds of this is earmarked for housing. (BBSR 2022)

The approval practice of the lower building authorities at the county offices is heterogeneous, without consistent clear guard rails through state and regional planning. Proof of the necessity of zoning new land is not always demanded in a binding manner (Bayerische Akademie Ländlicher Raum 2019).

Inner-urban development requires resources

Settlement development on greenfield sites is faster and cheaper, as follow-up costs are not taken into account. Inner development requires comparatively high human and financial resources and expertise. Municipalities often lack the financial means for interim acquisitions of land and buildings. And there is often a lack of access to existing properties if the owners do not cooperate (Umweltbundesamt 2018).

Municipalities have too few effective and manageable instruments and regulations for mobilising inner development potential. Small municipalities (which at the same time have a relatively large amount of inner development potential) are overburdened with inner development and need support from districts or other inter-municipal bodies. (ARL 2018)

Outdated municipal planning documents

In Bavaria, municipalities are not obliged to review and revise their land use plans on a regular basis (e.g. every 15 years). Often the older land use plans (often 30 years and older) are based on land demand forecasts that are based on economic and demographic development forecasts that have since become outdated. In addition, the potentials of internal development were not always (adequately) taken into account, or these potentials have been significantly changed by new development. (Umweltbundesamt 2018)

Consideration of long-term economic benefits in decision-making

The (long-term) economic benefits of sustainable land use should be more strongly incorporated into the decision-making process. In regard to cost transparency of new development projects, follow-up costs are estimated only in exceptional cases. Indications exist that a more transparent and long-term cost perspective (e.g. certificate trading simulation) lead to a more differentiated perspective on new development projects (Bayerische Akademie Ländlicher Raum 2019).

Land saving also an issue for public infrastructure

Land saving is strongly directed at municipalities and their urban land use planning. In Bavaria, however, they are only responsible for about 2/3 of land consumption. Approx. 13% are building permits for by law privileged projects in open spaces outside of zoned, urbanised areas (district offices), approx. 12% are planning approval procedures, approx. 6% are specialised permits (e.g. golf course according to water law); a reduction strategy is also necessary for these. (ARL 2019)

Outlook

Besides the – if necessary – constant adaptation of legal framework conditions, efforts to raise awareness and building capacities are key. An efficient land use can only be successful at the implementation level, i.e. in a joint effort with citizens and municipalities.

From the NGO perspective, efforts to lay the ground for regulatory measures should include a broad societal alliance, including the agricultural sector. A transnational initiative (e.g. EU) would increase chances of implementation and avoid races-to-the-bottom among neighbouring countries as seen in the past. At the implementation level, monetary incentives for land-saving efforts by municipalities and developers could promote the issue at the implementation level. In general, the awareness for the positive climate effects of land saving should be increased, potentially including soil in carbon-certificate trading systems.

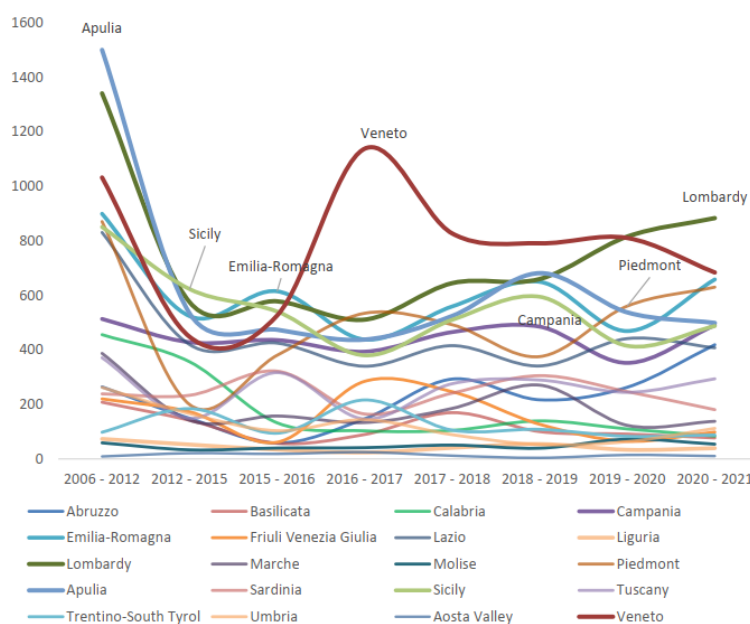
3.4 Italy

Land saving targets (status in 2022)

Target	At the national level, there is no land saving target for Italy. ³⁷
Reference document	Sistema Nazionale per la Protezione dell’Ambiente 2021:19
Current land take	5,175 ha/year in 2020 ³⁸ (which corresponds to approx. to 14.2 ha/day)
Method of quantification	Sentinel data / European Copernicus Program, Very High Resolution (VHR) satellite and aerial images and National map of land consumption produced by the National System for Environmental Protection (ISPRA, ARPA, APPA)

The WebGIS “Il consumo di suolo in Italia”³⁹, a product of Arpa Piemonte and ISPRA, is a very comprehensive tool to illustrate land take in Italy from the national, regional to the municipal level. The apparent decline in the increase of land take is due to the fact that the 2015 increase encompasses the three-year period May 2012- May 2015 and the 2012 value the six-year period May 2006- May 2012. Italy adopts the definition of “artificial land cover” as a definition for “land take”, thus excluding green and vegetated surfaces in urban areas.

Over the last 15 years of observation, a reduction can be observed for some regions. However, there are also significant rebound effects e.g. for Veneto, Piedmont and to a smaller extent also Trentino-South Tyrol for the period 2026-2017 or for Lombardy over the most recent observation periods (see Source: Sistema Nazionale per la Protezione dell’Ambiente, 2021,



with data from ISPRA/SNPA (modified).

Figure 10).

³⁷ The introduction of a net zero land take by 2030 is currently being discussed in Italy (see Senato della Repubblica 2021:33), but not yet adopted.

³⁸ <https://www.isprambiente.gov.it/it/attivita/suolo-e-territorio/il-consumo-di-suolo/i-dati-sul-consumo-di-suolo>

³⁹ https://webgis.arpa.piemonte.it/secure_apps/consumo_suolo_agportal/?entry=4

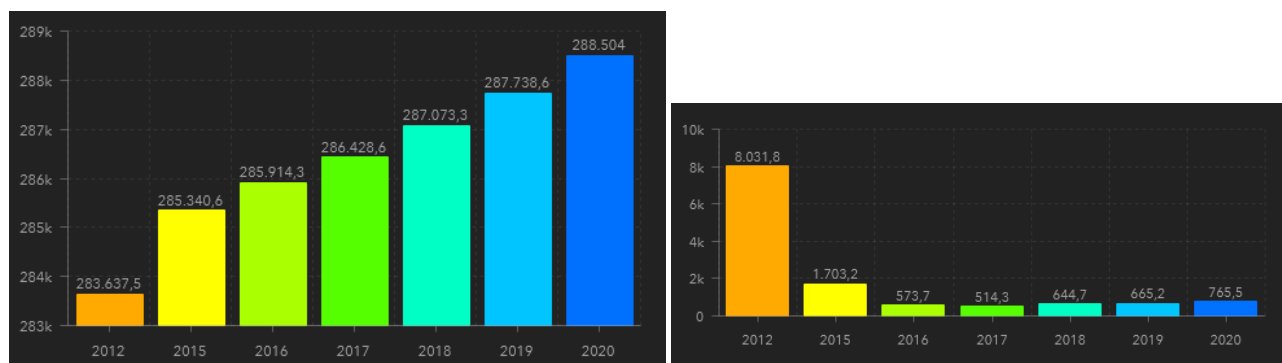
Source: Sistema Nazionale per la Protezione dell'Ambiente, 2021, with data from ISPRA/SNPA (modified).

Figure 10: Land take in Italian regions (ha/year).

3.4.1 Lombardy

Target	25% reduction of the forecast of land consumption from 2014 until 2020, a 45% reduction until 2025 and net zero land take in 2050. The reduction targets refer to planned settlements in municipal plans in force since 2014. It should be applied according to the demographic trend, the quality of soils and the regeneration potential of each municipality and according to provincial and regional targets.
Reference document	Regional law 31/2014 (legge regionale n. 31 del 28 novembre 2014 ⁴⁰): The law states that municipalities can no longer approve new forecasts of land take, while still being permitted to approve variations under the condition of "net zero".
Current land take	765,45 ha/year (which corresponds to approx. to 2.1 ha/day) from 2019 to 2020 ⁴¹ (Figure 11). The 2015 increase refers to the three-year period May 2012- May 2015 and the 2012 value refers to the six-year period May 2006 – May 2012.
Measures outlined in reference documents	Criteria for achieving objectives of urban renewal are laid down in the PTR. An ex-ante check of inner-urban development potentials needs to be conducted before zoning new land, incentives for retrofitting the existing building stock,

The land saving target has been integrated into the Regional Plan (Piano Territoriale Regionale, PTR) (Regione Lombardia, 2010, 2019) and provinces and municipalities are required to report land take data. The implementation process is described in Federici (2020).



Source: https://webgis.arpa.piemonte.it/secure_apps/consumo_suolo_agportal/?entry=4.

Figure 11: Land take in Lombardy (surface area and annual increases 2012-2020 in ha)

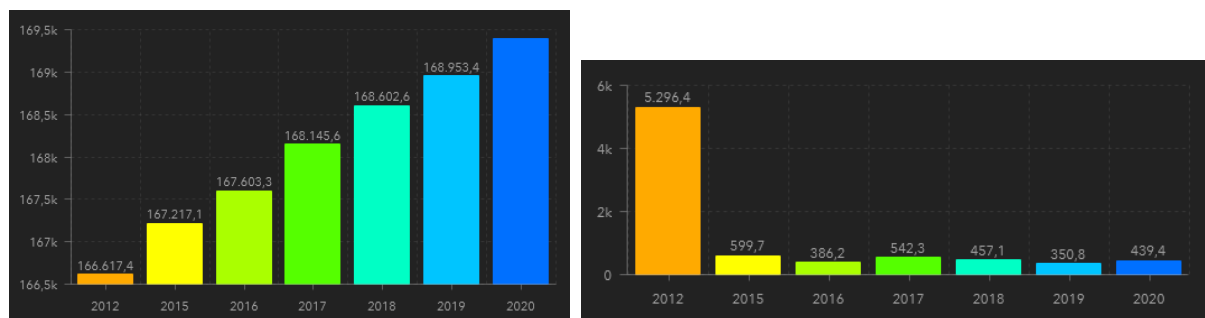
⁴⁰

http://normelombardia.consiglio.regione.lombardia.it/NormeLombardia/Accessibile/main.aspx?exp_coll=lr002014112800031&view=showdoc&iddoc=lr002014112800031&selnode=lr002014112800031

⁴¹ <https://www.isprambiente.gov.it/it/attivita/suolo-e-territorio/il-consumo-di-suolo/i-dati-sul-consumo-di-suolo>

3.4.2 Piedmont

Target	Max. 3% of existing urbanized area each 5 years ⁴² , Net zero land take (currently undefined timeline), according to draft regional law Nr. 302 (pending) by 2040
Reference documents	Norme di attuazione Nr. 31, Soil protection in Regional Law 56/1977 ⁴³ , last amended in 2016 (PTR Piemonte) (Regione Piemonte 2011) The Regional Law Draft Nr. 302 Urban planning and environmental law provisions for containing land take, presented on June 5 th 2018 (Disegno di legge regionale n. 302 presentato il 05 giugno 2018 Norme urbanistiche e ambientali per il contenimento del consumo del suolo) envisaged the net zero land take to be reached by 2040. ⁴⁴
Current land take	439,4 ha/year in 2020 (which corresponds to approx. to 1.2 ha/day) (see Figure 12). The 2015 increase refers to the three-year period 2012-2014 and the 2012 value refers to the six-year period 2006-2011.
Additional remarks	With 169,392 ha total land take in 2020 (ISPRA), the 3% target translates to 5,081 ha new land take for every 5-year cycle, 1,016 ha every year resp. 2.78 ha per day for the Piedmont region.



Source: https://webgis.arpa.piemonte.it/secure_apps/consumo_suolo_agportal/?entry=4.

Figure 12: Land take in Piedmont (surface area and annual increases 2012-2020 in ha).

3.4.3 Veneto

Target	40% reduction of the forecast of land consumption since 2011, Net zero land take 2050
Reference document	Decision Nr. 668 (dated May 15 th 2018), Art. 4 of the Regional Law Nr. 14/2017, Annex B of decision Nr. 668
Current land take	682 ha/year in 2020, corresponding to approx. to 1.9 ha/day. The 2015 increase (see Figure 13) refers to the three-year period May 2012 – May 2015 and the 2012 value refers to the six-year period May 2006 – May 2012.
Measures outlined in reference documents	Limitation of potential land take to 40% of land currently foreseen for urbanisation

⁴² <http://relazione.ambiente.piemonte.it/2018/it/territorio/stato/suolo-consumo>

⁴³ <http://arianna.cr.piemonte.it/iterlegcoordweb/dettaglioLegge.do?urnLegge=urn:nir:regione.piemonte:legge:1977:56@2018-10-24&tornaIndietro=true>

⁴⁴ http://www.regione.piemonte.it/cgi-bin/ufstampa/comunicati/dettaglio_agenzia.cgi?id=19834

With decision Nr. 668 (dated May 15th 2018), the Veneto Regional Government⁴⁵ approved the definition according to Art. 4 of the Regional Law Nr. 14/2017 on the maximum land take at regional level and its allocation at municipal and intermunicipal level (Alpine Convention 2020:24). This maximum value is defined as 40% (Annex B of decision Nr. 668) of the remaining potential urbanisation area, with corrections indicated for each municipality on an individual basis in regard to seismic classification, settlement pressure and ecological values. With this measure, the regional government is adopting important management and implementation tasks. Municipalities have reported 12,224 ha of land that are already transformed and an additional 21,323 ha that are - according to land use plans (strumenti urbanistici)- foreseen for residential or commercial purposes. Accordingly, the 40% share equals 8,530 ha – the maximum area still to be transformed until 2050, after which a net zero target is foreseen. Distributed equally over the 32 years (2018-2050), this translates to 266 ha annual or 0.73 ha daily land take.

The document Allegato C DGR Nr. 668 (March 15th 2018) (Regione del Veneto 2018:4ff) provides a list of all Veneto municipalities with the respective values, resulting in a maximum amount of land consumption permitted for each individual municipality (Quantita massima di consumo di suolo ammesso). The random case of Agordo (see Table 3) illustrates the far-reaching implications of this regulatory framework. Situated in the Bellunese Alps, the municipality features a total land take (Superficie di suolo consumato, ISPRA 2021) of 145 ha. According to the new law, the maximum remaining land take until 2050 is 4.3 ha – 40% of the total 7.17 ha currently foreseen for development.

Table 3: Assessment of maximum residual land take at municipal level for the Veneto region

ASO	Codice ISTAT	Comune	Provincia	RESIDUO	CORRETTIVO INDICATORI PER A.S.O.			CORRETTIVO INDICATORI PER I COMUNI				Riferimento Tabelle Allegato D
					RESIDUO RIDOTTO DEL 40%	percentuale dopo CORRETTIVO	RESIDUO DOPO CORRETTIVO	Variazione per classe sismica (2=-0,5%; 3=0%; 4=+0,5%)	Variazione per tensione abitativa (no=0%; si=+0,5%)	Variazione per varianti verdi (0,0001+0,05=-0,50%; 0,06+0,10=-1%; 0,11+14=-1,5%)	QUANTITA' MASSIMA DI CONSUMO DI SUOLO AMMESSO	
				ha	ha	%	ha	%	%	%	ha	
26	28001	Abano Terme	Padova	76,57	45,94	90,00%	41,35	0,50%	0,50%	-1,50%	41,13	②
23	29001	Adria	Rovigo	83,77	50,26	100,00%	50,26	0,50%	0,00%	-0,50%	22,24	① ②
16	23001	Affi	Verona	7,95	4,77	75,35%	3,59	0,00%	0,00%	-0,50%	3,58	
21	28002	Agna	Padova	27,73	16,64	92,13%	15,33	0,50%	0,00%	0,00%	15,41	
1	25001	Agordo	Belluno	7,17	4,30	100,00%	4,30	0,00%	0,00%	0,00%	4,30	
14	24001	Agugliaro	Vicenza	16,13	9,68	93,18%	9,02	0,50%	0,00%	0,00%	9,06	
4	25002	Alano di Piave	Belluno	6,61	3,97	95,39%	3,78	-0,50%	0,00%	-0,50%	3,75	

Source: Regione del Veneto 2018:4ff.

⁴⁵ Contenimento del Consumo di Suolo – Regione del Veneto (<https://www.regione.veneto.it/web/ambiente-e-territorio/contenimento-consumo-di-suolo>)

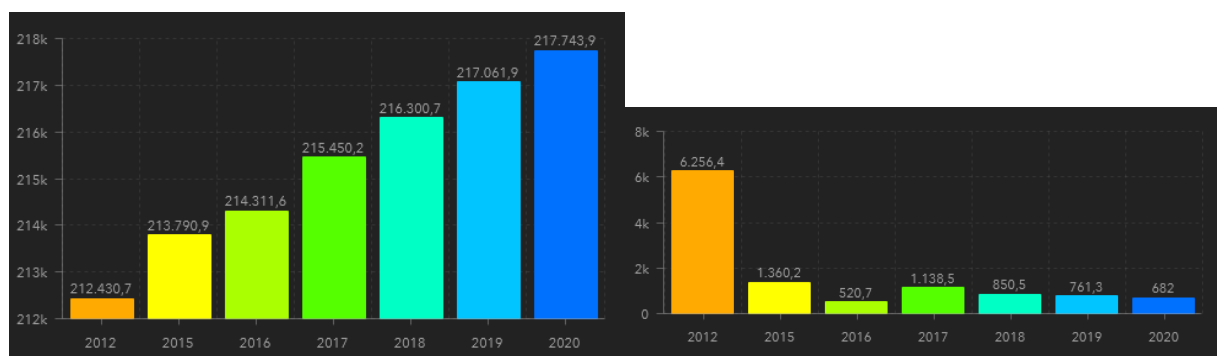
Implementation at municipal level

The maximum land take allocated by the Veneto region needs to be implemented in the municipal urban planning instruments. Before granting new permissions outside of consolidated urban areas, municipalities need to verify that they do not exceed this threshold. In any case, municipalities need to check beforehand if alternatives to taking up unbuilt land exist and need to report the result to the authorities approving zoning changes. Unsealing efforts are registered through an adaptation of total land balances.

Currently, 60% of municipalities (336 out of 563 Veneto region municipalities) have implemented their maximum land take in their respective urban planning instruments. Non-compliance leads to a moratorium of additional land take.

It is necessary to note that commercial development and logistics are not affected by these limitations. Nor does the Law Nr. 14/2017 apply to public infrastructures and buildings or those in the public interest.

The municipalities are legally obliged to adhere to the land take limits. However, for initiatives in the regional interest, municipalities can apply for additional permits from a “regional reserve” with regional authorities. The limited number of municipalities that have not enacted the regional law 11/2004 “Norme per il governo del territorio e in materia di paesaggio”⁴⁶ (Rules for the government of the territory and in the field of landscape) by drafting a municipal structural plan (PAT, piano assetto comunale) are also eligible to draw land use permits from the regional reserve.



Source: https://webgis.arpa.piemonte.it/secure_apps/consumo_suolo_agportal/?entry=4.

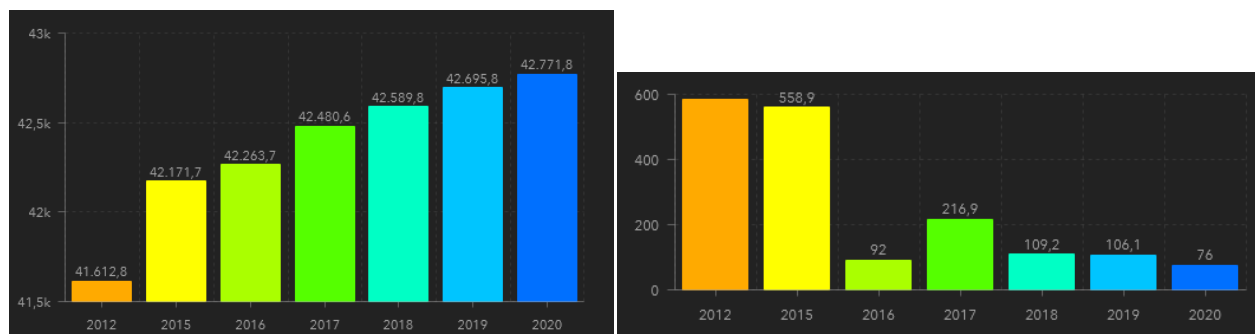
Figure 13: Land take in Veneto (surface area and annual increases 2012-2020 in ha)

3.4.4 Trentino–South Tyrol

Target	No quantitative target, but delineation of urbanisation areas for 10-year periods
Reference document	Dekret des Landeshauptmanns vom 22. November 2018, Nr. 31 / Decreto del president della provincia del 22 novembre 2018, n. 31
Current land take	Trentino–South Tyrol: 75.97 ha land take from 2019 to 2020 (Sistema Nazionale per la Protezione dell’Ambiente 2021:64) resp. 0.21 ha per day. The 2015 increase (see Figure 14) refers to the three-year period May 2012 – May 2015 and the 2012 value refers to the six-

⁴⁶ https://cdn1.regione.veneto.it/alfstreaming-servlet/streamer/resourceld/b9a7fa19-a9a7-4ceb-9cc3-84367a1b2908/LR_11_2004

	year period May 2006 – May 2012. After staying at or below 100 ha annually between 2018-2021, land take in Trentino–South Tyrol has increased for 2021-2022 to 130 ha ⁴⁷ . Between 2012-2017 daily increase of 0.24 ha of settled land.
Measures outlined in reference documents	Gemeindeentwicklungsprogramm / Programma di sviluppo comunale (Municipal development programme), which entails the following determinations: Delineation of settlement area Registration of vacant buildings (compulsory according to the new 2020 urbanisation law)



Source: https://webgis.arpa.piemonte.it/secure_apps/consumo_suolo_agportal/?entry=4.

Figure 14: Land take in Trentino–South Tyrol (surface area and annual increases 2012-2020 in ha)

As an incentive for energetically retrofitting the housing stock, an “energy bonus” allows owners to exceed the permitted building mass by 20% and up to 200 m³ for existing buildings (Autonome Provinz Bozen-Südtirol / Provincia Autonoma di Bolzano-Alto Adige 2014). Eligible buildings must be built before 2005 and have to be improved from a lower KlimaHaus-category to at least category C.

Current situation

While no quantitative land-saving target or national law on reducing land take and protection of soils exist at the national level, the issue is being increasingly debated at governmental levels, particularly at the local level. The National Recovery and Resilience Plan (NRRP) includes a non-binding objective of reducing land take and outlines various measures. While some proposals at the national level address the reduction of land take, an effective legal framework is currently not in place. Currently, the policy focus lies on decreasing the level of land forecast resp. zoned, but not yet developed built land. Regulations to reduce land take at regional level are seen by environmental NGOs as not having a significant effect yet⁴⁸.

Regions apply different definitions for measuring land take and regional statistics count zoning for urban purposes as land take. Consequently, the proposed EU Soil Monitoring Law could eventually result in a better statistical harmonisation among Italian regions. The monitoring efforts conducted by ISPRA are seen as a very valuable contribution, which through good communication manages to increase awareness for the issue of land take.

⁴⁷ https://www.snpambiente.it/wp-content/uploads/2023/10/consumo_suolo_estratto_dati_2023_anni_2006-2022.xlsx

⁴⁸ E.g. in the case of Lombardy, the annual increase in impermeable surface area steadily grew from 400 ha in 2016 to 900 ha in 2022 (Legambiente 2023), following the enactment of the Regional law 31/2014 (see above). Legambiente attributes the increase i.a. on the unplanned development of the Lombardy logistic district in the Po valley.

Since the 40% share of permanent habitable area for Italy is concentrated along its shores, the valley bottoms and the plains (Po), conflicts arise between settlement development and agriculture. Main drivers of land take, however, are commercial/logistic/infrastructural developments, the latter being of particular relevance in Veneto (ports / Alpine crossings).

Significant steps of the recent past

Over the last decade, an increased awareness can be observed at the national and local level as well as in public debate, which can partly be attributed to the recent major flood events and discussions about their causes.

The information on land take has been significantly improved through the monitoring of land take by ISPRA and the visualisation of regional and municipal results in a Geo-Mapviewer and dashboard.

Additionally, EU-funded projects (Horizon, Interreg) and EUSALP initiatives have increased awareness and a beneficial exchange among stakeholders and the public.

In the legal sphere, regional laws such as the Regional Agricultural Law of Lombardia (Legge Regionale 5 Dicembre 2008, Nr. 31) have assigned the status of a “common good” to soils and acknowledged NGOs to have legal standing in respective litigations, leading to verdicts being increasingly in favour of soil protection and land-saving efforts.

Particularly effective approaches

Linking the issue to ecosystem services, climate change adaptation and preservation of farmland proved to be particularly effective. ETC projects and cooperation in EUSALP are also considered to be particularly effective. The information base provided by ISPRA and its land take monitoring and Web-GIS applications are similarly considered to be very effective in regard to communication.

From the NGO perspective, the legal standing assigned to NGOs in litigations turned out to be particularly effective.

Challenges

Lack of a national land saving target and effective normative interventions

In view of a legal and normative framework, the lack of a national strategy, land saving target and respective laws setting binding guardrails for land take and soil protection represents one of the key challenges. According to ISPRA (2022), the ongoing and stable level of land consumption and land degradation in Italy is “...due to the absence or pending implementation of any effective normative interventions as well as a pending definition of a homogeneous policy framework at national level.”

Opposing drivers and target conflicts

Efforts to reduce land take are often in conflict with other spatially relevant developments and policies such as infrastructural investments in rural areas (e.g. datacentres, renewable energy installations) and privileged infrastructural projects in the agricultural sector such as operational facilities, stables, greenhouses, or buildings for vertical farming.

Mountain-specific processes such as abandonment of rural areas and pastures are not appropriately taken into consideration, aggravating causes for environmental hazards in the Italian Alps.

Rehabilitation of brownfields

A high share of greenfield developments for industrial or commercial purposes would be dispensable if brownfields would be rehabilitated to a higher degree. However, rehabilitation measures are too cost- and time consuming for conventional economic investment cycles, pointing to the need to develop rehabilitation funding mechanisms to significantly strengthen brownfield development.

Outlook

Possible next steps include continued efforts to increase awareness at the national level which could ultimately lead to improvements in the legal framework (national law on land take and soil protection, national land-saving target). To tap into the huge potential of brownfield development to combat land take in Italy, a mechanism for rehabilitating brownfields that includes proper funding e.g. through a rotating finance instrument could be a significant step forward.

3.5 Liechtenstein

According to the law on the protection and safeguarding of agriculturally usable soil (Gesetz vom 25. März 1992 über die Erhaltung und Sicherung des landwirtschaftlich nutzbaren Bodens, dated March 25th 1992)⁴⁹, each municipality has to designate at least 30% of its total area as agricultural use zone.

Current situation

While Liechtenstein has not adopted a quantitative land-saving target, it is pursuing a restrictive zoning policy for residential areas with the objective to safeguard the status-quo. The 1992 law on safeguarding agriculturally usable areas remains a cornerstone for these efforts. The administrative level practices a promotion of higher densities close to public transport nodes. The information base for inner-urban development has been significantly improved by the recent Raum+ study (Farner et al. 2022), which assessed vacant plots for the entire country and concluded that residential building reserves outnumber commercial reserves. These reserve zones pose a significant challenge. They are currently used for agriculture but are commonly perceived as “land to be developed”. To clarify this misleading assumption and in coordination with municipalities, there is an ongoing effort to depict these reserve zones with the signature “Agricultural use” in the revised National Spatial Plan (Landesrichtplan).

From the NGO perspective and due to its small size, land saving is a relevant issue for Liechtenstein, but is currently not predominant in public debate. The current situation is characterised by high pressures on land through diverse, sometimes overlapping and

⁴⁹

https://www.gesetze.li/konso/1992041000?search_text=landwirtschaftlich%20nutzbaren%20bodens&search_loc=text&lnr=&lgb lid_von=&observe_date=06.08.2021

contradicting uses, making spatial planning all the more relevant. The fact that a National Spatial Planning Law is missing is seen as a deficit.

Significant steps of the recent past

Significant recent steps included the 2022 Raum+ stocktaking study on vacant plots in preparation for the ongoing revision process of the Spatial Development Programme (Landesrichtplan) and the spatial concept 2020 and mobility concept 2030 (Government of the Principality of Liechtenstein / Ministry of Infrastructure, Economy and Sport 2020a; Government of the Principality of Liechtenstein / Ministry of Infrastructure, Economy and Sport 2020b), including a coordination of development focal areas with infrastructural capacities.

Planning-related issues have been brought to the forefront through several other recent projects and initiatives, including the project space and Transport (Raum und Verkehr) addressing the planning principle of aligning new settlement development with public transport, and the impulse Spatial Development Liechtenstein – Shaping instead of letting it happen (Stiftung Liechtenstein 2019).

From the NGO-perspective, planning principles of the National Spatial Plan such as area-based compensation, provisions for the economical use of soils and the ban on conversion of agricultural land are particularly relevant.

Particularly effective approaches

The minimum threshold of 30% of municipal territories that need to be allocated for agricultural production is seen as a particularly effective approach as it is based on a nation-wide assessment of agriculturally suitable soils and practically constitutes no-go areas for construction. Another effective approach for innerurban densification are provisions allowing exceedances of foreseen use limitations in return for public benefits. In regard to urban design qualities, the national design commission that assesses densification projects, is seen as an effective approach. It is independent from municipal policies and has no formal veto power, only consulting functions, but nevertheless consensual solutions are generally achieved. From an NGO perspective, no particularly effective approaches have been identified. While the necessary planning principles are in place, their direct effect on planning processes is not always satisfactory.

Challenges

The “raum+ Fürstentum Liechtenstein” final report identifies key findings for Liechtenstein as a basis for recommendations for activities (for the following see Farner et al. 2022). Municipalities have designated 46 priority areas (Schwerpunktgebiete) for non-residential uses that generally feature good framework conditions for further development. On 19 of these areas, municipalities are currently planning larger structural changes, including densification of buildings and uses.

Governance aspects

The strong municipal planning autonomy is seen as a challenge for coherent land saving policies. Target conflicts exist between national and municipal policy objectives. Initiatives from the administrative level such as the Spatial Planning Law or the Mobility Concept have in the past suffered defeat at the ballot box. The State Development Programme e.g. has not

managed to resolve certain land use conflicts and an integrated spatial planning law has still not been adopted despite efforts in the past.

Due to its small size, a high degree of personal relationships exists in Liechtenstein that may influence planning procedures and exceptions from planning regulations. The high level of prosperity is seen as creating a high infrastructural demand, which in turn triggers more land use.

Large share of settlement reserve

In relation to the total settlement area (Bauzonenfläche), the total settlement reserve of unbuilt land in residential, commercial and public use zones is 30%. The over-dimensioned construction zones for residential purposes date back to the 1970s. Compared to neighbouring Swiss cantons, this is a high share that once activation obstacles have been overcome, could immediately be available for development.

Poor access of land reserves to public transport

According to the Liechtenstein Inward-oriented Settlement Development Strategy, land reserves should be developed primarily in locations with good public transport accessibility. Yet only 10% of land reserves are categorised with “good” or “very good” accessibility, while 70% feature only medium or low accessibility.

Land ownership

Land ownership in Liechtenstein is characterised by a high share of private property, posing a challenge for the coherent implementation of land policy objectives e.g. through land hoarding. However, the public sector is with 17% the second-largest owner of land in Liechtenstein, predominantly in residential and public use zones. Therefore, the decision makers at municipal level are in a favourable bargaining position in regard to an active land policy.

Mobilisation of strategically relevant land reserves

More than half of land reserves above 2,000 m² are in private hand. More than 1/3 of land reserves with above-average accessibility are blocked by landowners and activation appears unlikely in the short and medium term.

Land reserves in commercial zones

While residential land reserves are mostly confined to Liechtenstein, land reserves in commercial zones are evenly distributed between Liechtenstein and Werdenberg. Per-capita land reserves are significantly higher in Liechtenstein than in the neighbouring Canton of St. Gallen.

Ownership interest the biggest activation obstacle in commercial zones

Activation and development are particularly challenging in areas with fragmented ownership structures. 10% of buildings in commercial zones are categorised as being in poor condition, but only 20% of them are reported to be undergoing renovation or replacement plans.

Outlook

Necessary next steps for Liechtenstein include a promotion and implementation of the focus areas for commercial development (align traffic flows with capacities, develop commercial sites

where infrastructurally appropriate). Compensation mechanisms for municipalities that are located beyond these commercial areas should be developed to avoid spatial misallocations. In order to avoid undesirable residential developments, the existing reserve zones should be explicitly depicted as agricultural zones. Buffer in existing residential zones deserve a closer look in regard to densification potential.

From the NGO-perspective, next steps should include the adoption of a Spatial Planning Law as well as intensified efforts to increase the awareness of the value of soils.

2.6 Monaco

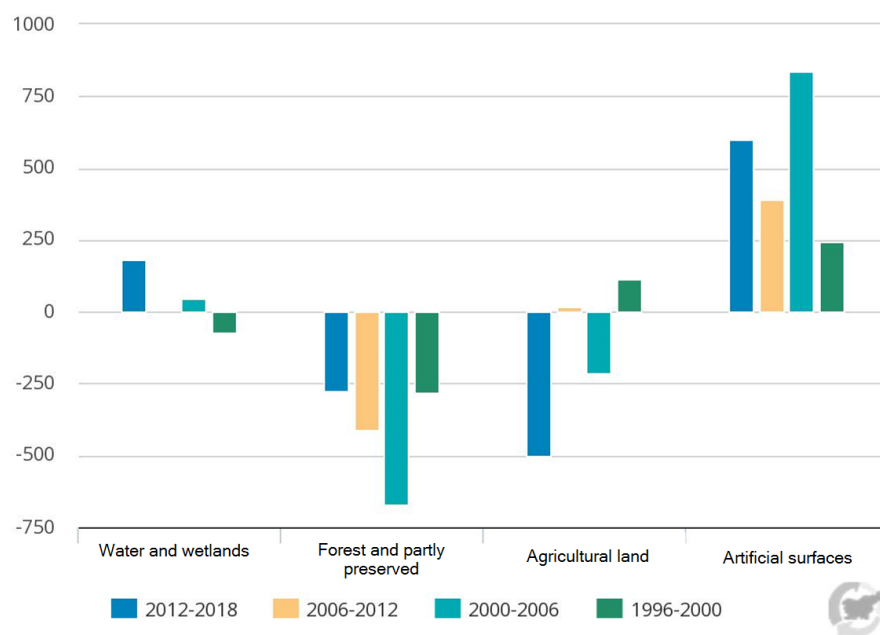
The Principality of Monaco is not pursuing a quantitative land saving target.

2.7 Slovenia

Land-saving targets (status in 2022)

Target	Reduction of net growth of built-up land by 25% until 2030 (reference year and indicator will be defined by 2030) and zero net growth of built-up land until 2050
Reference document	The targets are stipulated in the Resolution on the National Environmental Protection Programme (Republika Slovenija 2020).
Current land take	Between 2008-2012, 13,024 ha have been built-up, which equals a daily land take (rast površine pozidanih zemljišč or odvzem zemljišč) of 8.9 ha (Slovenian Environmental Report 2017 (Republika Slovenija 2017), Alpine Convention 2020:24)
Measures outlined in reference documents	In chapter 5.2, the resolution (Republic of Slovenia 2020) outlines soil protection targets and policies and measures to accomplish them, including activation of urban brownfields, information and monitoring, legal framework, awareness raising and networking of stakeholders.

According to land use statistics, land use changes over the last 20 years have predominately taken place for urbanisation at the expense of mostly forests and agricultural areas, with a shift over the last observation period from forest areas to agricultural areas as “contributors” (see Figure 15). The official numbers for “urban residential sprawl” in Figure 15 respectively Table 4 appear to be very low (e.g. total land consumption of 33 ha for the time period 2012-2018) and might change in the course of improved data availability.



Source: Slovenian Environmental Agency.

Figure 15: Land use changes (ha) for time periods in Slovenia

Table 4: Land use changes (ha) for time periods in Slovenia

	changes total[ha]	2012-2018[ha]	2006-2012[ha]	2000-2006[ha]	1996-2000[ha]
forests management	10852.72	7323.13	656.09	1863.95	1009.55
sprawl of economic sites and infrastructures	2521.06	578.55	564.45	1073.23	304.82
water bodies creation and management	387.80	253.14	5.05	54.51	75.10
changes due to natural and multiple causes	287.07	80.52	0	14.61	191.94
urban residential sprawl	84.60	33.11	22.44	17.67	11.37
withdrawal of farming	87.64	34.08	0	5.62	47.94
urban land management	1003.71	241.08	372.40	0	390.23
agriculture internal conversions	111.68	92.18	0	0	19.50
conversion from forested & natural land to agriculture	495.79	104.85	63.11	0	327.83

Source: Slovenian Environmental Agency.

Planned land use in Slovenia

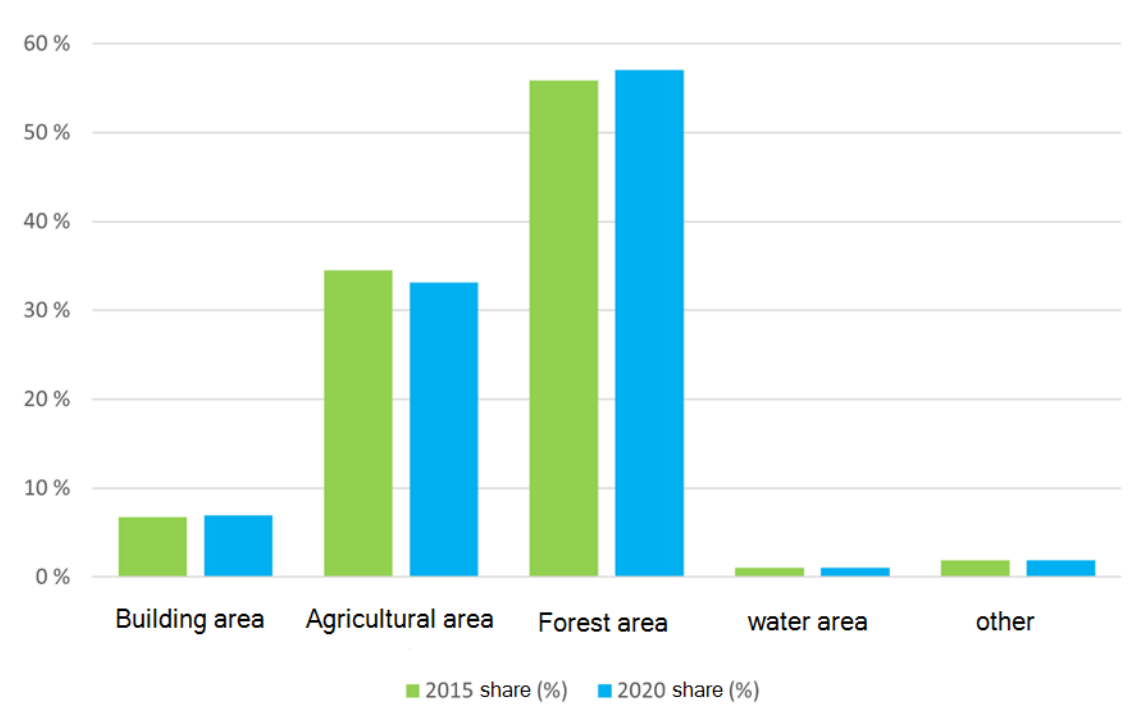
Based on data on basic planned land use (see Table 5), obtained from the collective information layer of planned land use, it is evident that in 2020 the largest share of land is covered by forest planned land use (57% or 1,177,991.69 ha), followed by agricultural planned land use (33, 11% or 683,519.17 ha). The share of building planned land use is 6.91% or 142,595.02 ha of the entire territory of Slovenia. Areas of other planned land uses represent a smaller share (1.89% or 38,973.73 ha), while the smallest share of areas comprises water bodies (1.04% or 21,434.00 ha).

Table 5: Areas of basic planned land use according to the total area of Slovenia (in ha and %) in 2020

Categories of planned land use	2015 (%)	2020 (%)	2020 (ha)	Index 2015/2020*
Building Areas	6.70%	6.91%	142,595.02	103.06
Agriculture areas	34.50%	33.11%	683,519.17	95.95
Forest areas	55.85%	57.06%	1,177,991.69	102.16
Water	1.02%	1.04%	21,434.00	101.41
Other	1.92%	1.89%	38,973.73	98.43
Total	100.00%	100.00%	2,064,513.61	

Source: UURS, MESP, 2020; *index is calculated based on shares.

Based on a comparison of basic planned land use between 2015 and 2020 (Figure 16), a slight increase in the share of building planned land use can be observed, from 6.7 to 6.91% (index 103.06), which in five years amounts to more than 4,000 ha. The share of forest planned land use (index 102.16) decreased by more than 24,000 ha, while the share of agricultural planned land use (index 95.95) has decreased by slightly less than 28,000 ha.



Source: UIRS, MESP data, 2020

Figure 16: Difference in areas of categories of basic planned land use (index 2015/2020), Slovenia 2015-2020

Current situation

Policies are increasingly addressing the issue, but the effect over the course of the last 20 years is considered to be rather limited. An increasing awareness among decision makers at national level is seen in contrast to a persistently low awareness at local level. At the level of decision-making, municipal planning authority often overrides national planning stipulations.

Urban sprawl is an important source of emissions and negative environmental effects (road infrastructure, transport volumes, heating, removal of topsoil) in Slovenia. A specific land-use, yet not sprawl-related issue is the reforestation of former agricultural land on slopes and low-productive areas, while areas cultivated with special crops such as wine, olives and orchards are more stable. Slovenia has seen a forest increase of 87% between 1935 and 2020.

Significant steps of the recent past

In 2015/2016, the Ministry of Agriculture, Forestry and Food commissioned a project on improving soil data for Slovenia (soil maps, Web-GIS). Currently, a project commissioned by the Ministry of the Environment elaborates tools and strategies to minimize urban sprawl and protect agricultural land. An ongoing project is assessing soil qualities and measuring the effects of planning decision.

Particularly effective approaches

While no particularly effective approaches have been reported for Slovenia, high expectations are being placed in the EU Soil Health Directive, including a mandatory monitoring of soil sealing.

Challenges

The key challenge from the perspective of the interview partner is the process of adapting existing spatial plans e.g. in regard to provisions of recent political initiatives such as the National Environment Programme 2030, the Spatial Development Strategy 2050 and the proposed Strategic Plan for Circular Space Management 2024-2030. The reduction of land take as well as mid- and long-term quantitative targets plays a prominent role in these documents and the challenge remains how to communicate and implement them at the municipal level. Awareness raising at the regional and municipal level thus remains an important task to close the educational gap regarding the benefits and tools.

A shift of planning competences from the municipal to the regional level would be desirable in regard to capacities and know-how but is deemed politically unfeasible.

Presently, the planning framework is seen as providing little guidance for weighing and prioritising among contradicting interests. Consequently, planning strategies should be harmonised and substantiated to provide for a more effective and state-wide consistent spatial planning.

Outlook

As next steps, the interview partner sees the establishment of clear and effective strategies for soil management, including workflows and tools for planners. More emphasis should be placed on the multiple benefits of soil protection and its relevance in regard to ecosystem services

that soils provide. An ongoing task remains to increase awareness for the issue, particularly among the younger generation.

2.8 Switzerland

Land-saving targets (status in 2022)

Target	<p>Reduction of land take by a third compared to 2020 until 2030 and net zero until 2050. Target of 17% of the total area of Switzerland to be set aside for the protection of native species and plants (only draft status in the nNHG).</p> <p>Limitation of the number and plot area of buildings outside the building zone (Plafonierung bzw. Stabilisierungsziel), only draft status in the RPG revision process).</p> <p>No net land take by 2050, with compensation according to qualitative requirements, not area size (Bundesamt für Umwelt 2020:22).</p>
Reference document	<p>Swiss Sustainable Development Strategy 2030 Goal 15.3 (Schweizerische Eidgenossenschaft / Schweizerischer Bundesrat 2021:24)</p> <p>Swiss Soil Strategy (Bodenstrategie Schweiz, Bundesamt für Umwelt 2020:22)</p> <p>Draft revision of the Swiss Nature and Cultural Heritage Protection Act (Natur- und Heimatschutzgesetz NHG) (Schweizer Eidgenossenschaft 2021:7)</p> <p>Draft revision 2 of the Swiss Spatial Planning Act (RPG) of 2021</p>
Current land take	<p>Total settlement area increased by 776 km² (= average daily land take of 6.4 ha) between 1985 and 2018 and by 181 km² between 2009 and 2018 (= average daily land take of 5.5 ha) (Bundesamt für Statistik 2021:9)⁵⁰</p>
Measures outlined in reference documents	<p>Revision of the Spatial Planning Act 2014. From the entry into force of the revised law on May 1st 2014, the cantons had five years to adapt their structure plans. In cantons that do not have a structure plan approved by the Federal Council on April 30th 2019, a zoning freeze applies. The same applies if they do not have a regulation on compensation for added value that complies with the RPG.</p> <p>The Action Plan of the Swiss Sustainability Strategy 2021-2023 foresees to expand the basis for a monitoring of soil sealing in the form of a monitoring concept (Schweizerische Eidgenossenschaft / Schweizerischer Bundesrat (2021b:15).</p>
Method of quantification	<p>Aerial photography for land use data in 10-year-intervals; for statistics of construction zone: land use planning data of cantons, revision every 5 years</p>

In Switzerland, construction is only permitted within building zones. According to the 2017 building zone statistics ⁵¹ (Schweizerische Eidgenossenschaft / Bundesamt für Raumentwicklung 2017), these occupy a total area of 232,038 hectares. Well over 80% of this area is already built over. About one seventh of the building zones are still undeveloped. The building zones that have not yet been built over theoretically offer space for another 1 to 1.7

⁵⁰ <https://www.bfs.admin.ch/news/de/2021-0316>

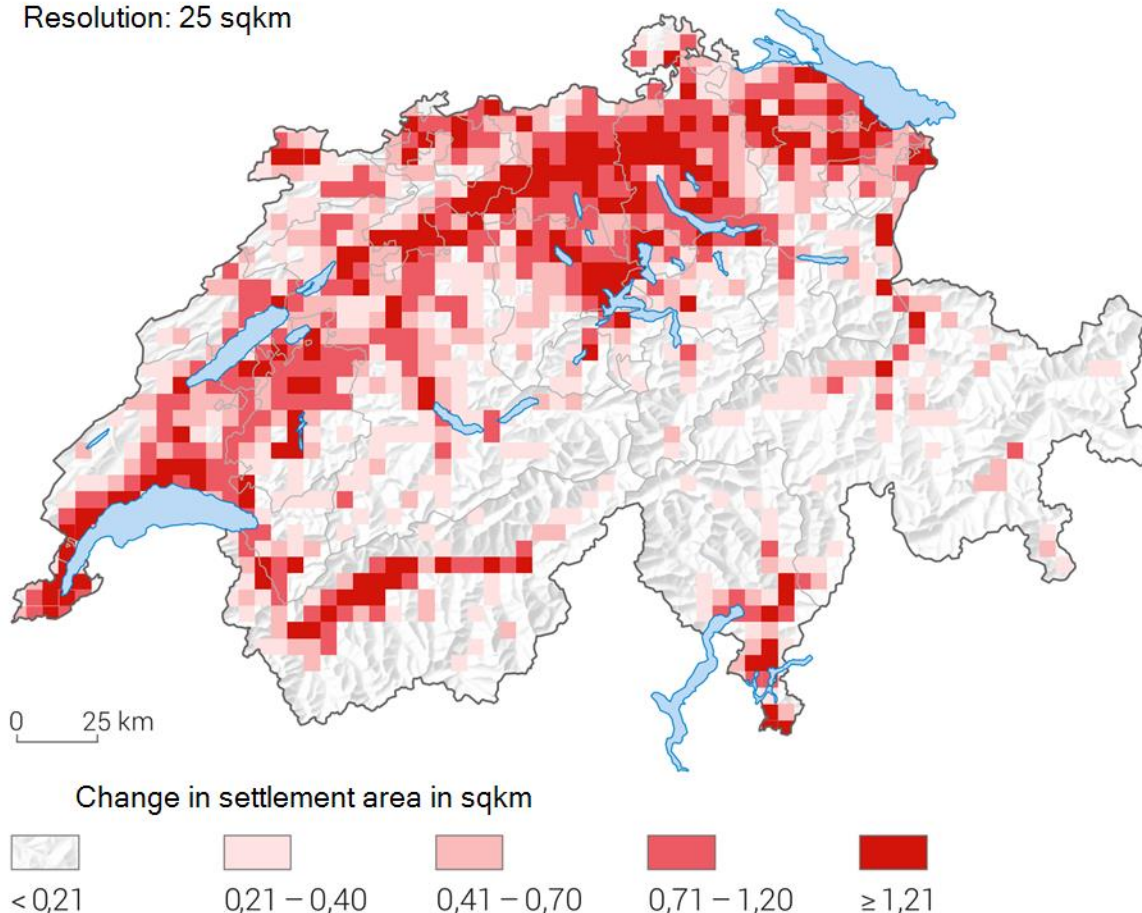
⁵¹ Statistica delle zone edificabili / Bauzonenstatistik / statistique des zones à bâtir

million inhabitants. An overly generous designation of building zones contradicts the principle of economical use of land.

The area of building zones that have not yet been built over is too large in some cantons and regions, as more than the legally defined demand for the next 15 years is covered. Moreover, the areas of building zones that have not been built over are often located in rural areas, especially in agricultural and tourist communities. In densely populated agglomerations with high growth dynamics and correspondingly high demand (see Figure 17), however, available land is a scarce commodity. The building zone statistics are collected every 5 years.⁵²

Settlement area 1985-2018

Resolution: 25 sqkm



Source: BFS Swiss areal statistics (AREA)

© BFS 2021

Figure 17: Settlement area increases for 25 km² grids 1985-2018

The discussion surrounding the revision of the Federal Act on the Protection of Nature and Cultural Heritage (NHG) illustrates a conflict of interest – at least in public debate – between densification and architectural qualities of settlements. The economic stakeholder

⁵² <https://www.are.admin.ch/are/de/home/raumentwicklung-und-raumplanung/grundlagen-und-daten/raumbewachung/siedlung/bauzonen.html>

EconomieSuisse⁵³ argues against an integration of architectural qualities (Baukultur) in the revised NHG, stating that architectural qualities are not connected to biodiversity and that inner-urban development might be obstructed by prioritisation of architectural qualities.

In the hearing phase of the revision of the Swiss Spatial Planning Act 2021, the foreseen stabilisation of the number and plot area of buildings outside the building zone is generally supported by the national planning association EspaceSuisse, which however criticises the unclear formulation of the objective and proposes to extend it to transport infrastructure and agriculture.⁵⁴

Related to the reduction of land take in Switzerland is the target value of securing 17% of land cover for biodiversity purposes, proposed in Article 18 of the draft revision of the Federal Act on the Protection of Nature and Cultural Heritage (NHG). EspaceSuisse⁵⁵ is arguing to increase the target value to 20%, also in view of the proposed of conserving at least 30% of the global land area through systems of protected areas and other effective area-based conservation measures as part of the UN Global Biodiversity Framework.⁵⁶

In Switzerland, construction is only permitted within building zones. According to the 2022 building zone statistics (Schweizerische Eidgenossenschaft / Bundesamt für Raumentwicklung 2017), these occupy a total area of 234,337 ha. From 2012 to 2022, between 5,300 and 6,800 ha respectively 2.3 to 3% of the building zones have newly been developed. At the same time, the population in building zone has increased by 12% in the same time period, from 7.4 to 8.3 Mio. Consequently, the building zone area per capita has decreased, from 309 m² to 282 (Bauzonenstatistik Schweiz 2023).

Between 10 and 16 % of the building zones are still undeveloped. The building zones that have not yet been built over theoretically offer space for another 0.9 to 1.6 million inhabitants.⁵⁷

The area of building zones that have not yet been built over is too large in some cantons and regions, as more than the legally defined demand for the next 15 years is covered. Moreover, the areas of building zones that have not been built over are often located in rural areas, especially in agricultural and tourist communities.

Current situation

While the net-zero target 2050 and the intermediate land-saving target are not part of the public debate, the need to stop urban sprawl is widely acknowledged. The national land-saving targets have not regionalized at the cantonal level yet.

The 2012 revision of the Spatial Planning Law (RPG) has resulted in a more efficient and regulated management and settlement development within building zones. Challenges remain such as the slow pace of inner-urban development, a vacancy rate that most likely exceeds

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<https://www.economiesuisse.ch/sites/default/files/publications/20210709%20Vernehmlassung%20indirekter%20Gegenentwurf%20Biodiversit%C3%A4tsinitiative.pdf>

⁵⁴ https://www.espacesuisse.ch/sites/default/files/documents/Revision_RPG%20_VL_2021_EspaceSuisse_d_Resume_f.pdf

⁵⁵ https://www.espacesuisse.ch/sites/default/files/documents/Revision_NHG_Stellungnahme_EspaceSuisse_d.pdf

⁵⁶ <https://www.un.org/sustainabledevelopment/blog/2021/07/a-new-global-framework-for-managing-nature-through-2030-1st-detailed-draft-agreement-debuts/>

⁵⁷ <https://www.are.admin.ch/are/de/home/raumentwicklung-und-raumplanung/grundlagen-und-daten/raumbewachung/siedlung/bauzonen.html> (14.03.2022)

official reporting, and unresolved housing shortages that trigger calls for deregulation and faster zoning, despite being more a distributive than a quantitative problem. Land markets and development projects in agglomerations are strongly influenced by global financial markets and the recent attractiveness of real estate as investment

Outside of buildings zones, land take for privileged purposes is becoming increasingly problematic. Driving factors include transport infrastructure, agricultural facilities (e.g. greenhouses complying with zoning requirements) and the expansion of renewable energies (ground-mounted solar panels). For the latter, the limiting factor for projects in remote areas is grid capacity.

Significant steps of the recent past

Significant steps of the recent past include the 1st and 2nd revision of the Spatial Planning Law, the first focussing on activation and redimensioning of zoning reserves, the latter on regulating developments outside of settlement areas.

Additionally, the 2020 revision of the Thematic Plan Crop Rotation Areas by the Federal Council strengthened the role of crop rotation areas in planning procedures outside of building zones.

Particularly effective approaches

Both interview partners identified the 2014 Revision of the Spatial Planning Law and the Thematic Plan Crop Rotation Areas as particularly effective approaches:

Following the 2014 RPG revision, most Cantons have reviewed their Guiding Plan (Richtplan). Delays are consequential for Cantons, leading to a practically frozen status quo of spatial planning and zoning. Additionally, the RPG equipped Cantons with instruments such as the expansion of building obligations also within building zones, tax incentives and progressive tax rates and the absorption of a minimum of 20% value added through zoning and earmarking these revenues for spatial planning measures.

The Thematic Plan Crop Rotation Areas has managed to protect the quota of valuable areas. Within these areas, intensive cultivation however may continue to deteriorate soil qualities. In 2020, the Thematic Plan has been revised and a detailed analysis of soil qualities is envisaged.

Challenges

Activation of brownfield sites and awareness raising

When implementing the revised Spatial Planning Law and applying instruments to activate brownfield sites, the Swiss Agency for Spatial Development points out the importance to not only focus on construction densities, but also use densities. Otherwise, the land-saving effect of newly created inner-urban residential and business zones will be compensated through continuously growing individual land consumption (Bundesamt für Raumentwicklung 2018, p. 13). In this context, the acceptance of density and a shared understanding of settlement / architectural qualities and the climate-positive aspect of reusing existing buildings⁵⁸ need to be

⁵⁸ Raising the visibility of these issues through e.g. the Klimaoffensive-Initiative: <https://www.klimaoffensive.ch/>

improved. In turn, this would improve the currently difficult marketability of the existing building stock.

Land hoarding

To avoid land hoarding, the revised Swiss Spatial Planning Law requires cantons to provide for measures to activate brownfields in their Building and Planning Laws. If justified by the public interest, municipalities should set a time limit for construction approvals and foresee measures to mobilise zoned land once the limits have run out (Art. 15a Abs. 2 RPG).⁵⁹ The consistent integration and implementation of these national provisions at subsequent planning levels remains a challenge, as an overview by EspaceSuisse on cantonal construction land mobilisation measures⁶⁰ suggests.

Application of steering instruments and municipal planning authority

While landscape protection is generally well established in Switzerland, Leuthard & Tobias (2018 :51) argue that the biggest challenge in Switzerland includes the application of existing steering instruments. Though progressive at the upper planning levels, the RPG and the Cantonal Guiding Plans need to be coherently enforced through individual municipal land use plans. Due to the substantial decision-making power vested in municipalities, cooperation across municipal borders respectively at regional level remains a challenge.

Current and area-wide data on soils

Additionally, soil function evaluations and their integration in the weighing of interest process are impeded by the lack of high-resolution soil data in Switzerland (ibid). This deficit is currently being tackled through preparatory steps towards area-wide soil mapping for Switzerland, based on an approval by the Federal Council in 2023⁶¹.

Challenges in the implementation of the Law on Secondary Homes

While generally considered to be an effective instrument to reduce land take⁶², municipalities are encountering the following challenges when implementing the Law on Secondary Homes (infraconsult 2023:50):

- Insufficient definition of a building unit for touristic apartments
- Definition and benchmarks, in what situation enterprises are jeopardized when not given the chance to sell secondary homes
- Assessment of the “actual use of an apartment“ is complex and often not verifiable
- Definition of the term “landmark character for the village (ortsbildprägend)” is vague
- No universal definition how to assess whether the permanent preservation of a building worthy of protection cannot be achieved otherwise.

Particularly the conversion of apartments not falling under the provisions of the law (“altrechtliche Wohnungen”) is having negative effects on affordable housing at local level,

⁵⁹ <https://www.espacesuisse.ch/de/raumplanung/handlungsfelder-der-innenentwicklung/baulandmobilisierung> (14.03.2022)

⁶⁰ https://www.espacesuisse.ch/sites/default/files/documents/d_Tabelle_Kantone_Mobilis_A3_240426.pdf

⁶¹ <https://www.bafu.admin.ch/bafu/de/home/themen/boden/fachinformationen/bodenkartierung.html>

⁶² <https://www.espacesuisse.ch/de/news/das-zweitwohnungsgesetz-wirkt>

especially in tourist areas.⁶³ An interview partner referred to isolated cases in which municipalities bypass the secondary home limit of 20%⁶⁴ by merging with other municipalities with lower secondary home shares.

While the Law on Secondary Homes contains measures to reduce the conversion of first to secondary homes, only few municipalities take advantage of this opportunity.

Exceptions for building outside of building zones

Since it entered into force in 1979, the Spatial Planning Law (RPG) has been amended with a constantly increasing number of exceptions for building outside of building zones – from 3 in 1979 to 19 in the RPG amended in 2018.⁶⁵ In the agricultural sector, agriculture-related outbuildings for livestock, cooling and packaging are driving land take outside of building zones. Underlying factors are the steep real estate gradient between agricultural land and plots for cooling and packaging facilities in commercial zones as well as the high number of livestock.

These exceptions have been one of the core ratios for the Swiss Landscape Initiative (Landschaftsinitiative 2019:1). More than 40% of built-up area is located outside of the building zone. Cantonal concepts promoting ecological infrastructure (Swiss term for Green and Blue Infrastructure) are often facing opposition from the agricultural sector.

In a qualitative sense, the strict separation between architectural quality standards within and outside of building zones remains a challenge in regard to cultural landscape and settlement qualities.

Renewable energy installations

Energy infrastructure e.g. in the form of ground-mounted solar panels are also contributing to land take outside of building zones. As part of the Solar Offensive in 2022, the Swiss federal government has eased permissions and foresees public grants for solar installations in mountain areas. How these regulations affect land take outside of Swiss building zones remains to be seen, but they could potentially trigger land take.

According to an interview partner, an imbalance exists in the spatial-planning weighing of interests between land-saving and renewable energy expansion. The significance of intact ecosystems and biodiversity is often too little understood in this process.

Fragmentation through road infrastructure

Since 1990 the land use for road infrastructure outside of building zones has increased by 15% resp. 63,000 ha, leading to fragmentation of landscapes and habitats (Landschaftsinitiative 2019:1).

⁶³ <https://www.are.admin.ch/are/de/home/medien-und-publikationen/medienmitteilungen/medienmitteilungen-im-dienst.msg-id-94936.html>

⁶⁴ Since 2016, the Federal Law on Secondary Homes (ZWG) requires municipalities to conduct annual assessments of their building stock and to limit the share of secondary homes to a maximum of 20% of the total number of homes. Managed secondary homes are exempt from this limitation.

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https://www.espacesuisse.ch/sites/default/files/documents/EspaceSuisse_Bauen%20auesserhalb%20Bauzone_RPG%20Zunahme%20der%20Ausnahmen_2.pdf

Tax system

The tax system in part leads to counter-productive effects on land take in the form of tax-deductible mortgage rates and commuting costs that promote suburbanisation and decentralised settlement patterns.

Outlook

In respect to the legal framework for spatial planning in Switzerland, interview partners argued for a consistent implementation of the 2014 revision of the Spatial Planning Law and a rapid passing of the 2nd revision of the Spatial Planning Law. The latter is expected to strictly regulate building outside of building zones. For these developments, standards for architectural qualities should be significantly stepped up.

An increasing importance is attributed to the limitation of sealing and promotion of desealing activities. This includes measures in the road network in regard to dimensions of infrastructure, traffic regulation and speed limit. Desealing should be promoted as an effort to address both land-saving and climate protection.

It would be desirable to establish more binding instruments for implementing the Swiss Strategy Sustainable Development 2030 (SNE 2030). In general, a readjustment of political priorities is called for, assigning higher priorities to soil and ecosystem qualities in the context of the current focus on growth and energy production.

Most important challenges from the perspective of interview partners

Interview partners were asked to identify the three most important challenges to achieving land-saving targets in their respective countries. The identified challenges have also been included in the respective national sub-chapters above but are listed here as an overview.

	Three most important challenges identified by interview partners ⁶⁶
Austria	<ul style="list-style-type: none"> • Perception of land take differs between federal states with high or low shares of permanent settlement area • Perceived link between land consumption and job creation • Property taxation with significantly lower tax rates for vacancies/underutilization • Management of secondary homes • Land take related to road and parking areas • Land take statistics do not account for intensive touristic use surrounding infrastructure
France	<ul style="list-style-type: none"> • Cultural change to overcome belief that development equals land consumption • Price differences between agricultural land and zoned land, incentivizing urbanization • Administrative capacity building for complex task of brownfield development at municipal level
Germany	<ul style="list-style-type: none"> • Lack of regulatory, binding land saving framework • Translate the general awareness for the importance of soil protection to concrete decisions at municipal level • Municipal decisions guided by prevailing single-family home narrative
Italy	<ul style="list-style-type: none"> • Counterproductive driving forces and target conflicts • Lack of national land take reduction target • Rehabilitation of brownfields for industrial and commercial uses too costly and time-consuming • Insufficient spatial planning interventions in areas with conflicting land uses (e.g. logistic sector) • Mountain-specific processes (abandonment of settlements and pastures and its consequences for natural hazards) receive too little attention
Liechtenstein	<ul style="list-style-type: none"> • Handling of zoning reserves • Municipal autonomy and target conflicts between national and municipal policy objectives • Insufficient application of an active land policy • Lack of an integrated spatial planning law

⁶⁶ For countries for which two interviews were conducted, up to six challenges can be listed.

	<ul style="list-style-type: none"> • Challenging ownership structure (high share of private property) • Land hoarding
Slovenia	<ul style="list-style-type: none"> • Adapting existing spatial plans and communicate/implement them at municipal level • Awareness raising at regional and municipal level (educational gap) • Shift of planning competences from the municipal to the regional level
Switzerland	<ul style="list-style-type: none"> • Regulation of building outside of building zones • Tax system (deductibility of mortgage rates and commuting costs) • Imbalanced weighing of interests in favour of renewable energies at the expense of intact ecosystems/biodiversity • Regional cooperation across municipal borders • Acceptance of densities • Shared understanding for architectural qualities and climate-positive effects of reusing existing buildings

Outlook and possible next steps

Possible next steps identified by interview partners ⁶⁷ for their respective countries – irrespective of their feasibility:	
Austria	<ul style="list-style-type: none"> • Emphasis on existing building stock (vacancies, activation programmes, transformation options, desealing) • Federal engagement and focus on inner-urban development • Involve sector and infrastructure policies in land-saving efforts • Increased spatial planning competences at the national level (yet unrealistic due to constitutional hurdles) • Addressing excessive zoning reserves
France	<ul style="list-style-type: none"> • Ensure legislative stability: Laws and regulations to combat land take require time to become effective and efforts are vulnerable to shifting priorities • Fiscal reform to cap excessive profits driving land consumption • Adoption of legal, obligatory reduction targets in other countries (Germany, Austria etc.) to create a consistent framework
Germany	<ul style="list-style-type: none"> • Constant adaption of the legal framework where necessary • Information and awareness-raising to increase impact at the implementation level • Broad societal alliance, including the agricultural sector, for a more consistent framework

⁶⁷ For countries for which two interviews were conducted, up to six challenges can be listed. Statements from administrative and NGO interview partners are listed without differentiation.

	<ul style="list-style-type: none"> • Supra-national initiative to avoid races-to-the-bottom between neighbouring countries • Monetary incentives for municipalities and developers • Increase awareness for positive climate effects
Italy	<ul style="list-style-type: none"> • Increase awareness at the national level to establish a national legal framework (national law on land take and soil protection) • Mechanism for rehabilitating brownfields (e.g. rotating finance instrument)
Liechtenstein	<ul style="list-style-type: none"> • Promote commercial focus areas and establish compensation mechanisms for municipalities beyond these areas • Depict reserve zones as agricultural zones to avoid residential development • Adopt a Spatial Planning Law • Increase awareness for the value of soils
Slovenia	<ul style="list-style-type: none"> • Establishment of clear and effective strategies for soil management (workflows and tools for planners) • More emphasis on the relevance / ecosystem services soils provide • Increase awareness among the younger generation
Switzerland	<ul style="list-style-type: none"> • Implementation and completion of the 1st/2nd revisions of the Spatial Planning Law, particularly in regard to developments outside of building zones • Desealing and downsizing efforts in road infrastructure and building • Readjustment of political priorities towards soil and ecosystem qualities • Binding instruments for the Swiss Strategy Sustainable Development 2030

3. SUMMARY

Land saving targets

Based on the screening of the status quo of land-saving targets in the Alps, the following aspects can be underlined:

- At a national level, Austria, France, Germany, Slovenia and Switzerland have adopted quantitative land-saving targets in the form long-term targets (net-zero by 2050) and/or mid-term (2030) target. Austria, Italy, Liechtenstein and Monaco have not adopted a net zero target.
- At federal state resp. regional level, Bavaria, Auvergne-Rhône-Alpes, Provence-Alpes-Côte d'Azur, Piedmont, Veneto and Lombardy have adopted quantitative land saving targets. Auvergne-Rhône-Alpes and Piedmont are even aiming to achieve the net zero target by 2040.
- While lacking a quantitative land saving target at national level, binding implementation mechanisms exist in the Italian regions (Piedmont, Lombardy and Veneto)

- While not pursuing a quantitative land saving target, the region of Trentino–South Tyrol is requiring municipalities to delineate their urbanisation areas based on a registry of vacant land
- Awareness is perceived differently in Alpine states. While Italian interview partners see more awareness at the local than at the national level, the Slovenian expert perceived the situation inversely for Slovenia, where the local level lacks awareness.
- Experts from Austria as well as from Italy consider residential development to be a relatively minor driving factor of land take compared to commercial development.

Summing up, three approaches to land saving targets can be classified:

- Voluntary targets at national level without regionalisation or cap (AT, DE, FR, SI)
- Regionalised land saving targets (France, Italian regions). For France, the mid-term target and long-term target of net-zero stipulated in the Climate Resilience Law requires subsequent planning institutions to incorporate these targets in their planning documents at the respective regional, intermunicipal and municipal level.
- Regulatory framework that limits urbanisation at municipal level based on binding mechanisms (CH, South Tyrol), but without explicit regionalisation of quantitative targets

Figure 18 illustrates that Alpine countries as well as the regions that have adopted land saving targets are still facing considerable challenges in regard to reducing land take and embarking on reduction pathways that would lead to net zero land take by 2050. However, the topic is very dynamic in many parts of the Alps and discussions on effective instruments can be expected to intensify when approaching the crucial timeline of 2030.

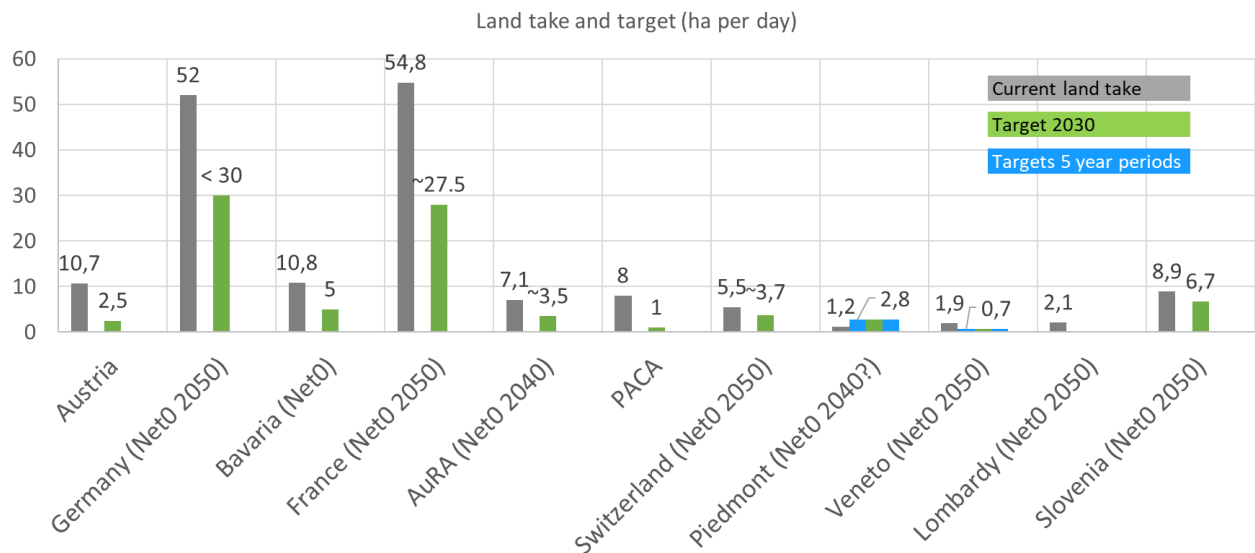


Figure 18: Current land take and land saving targets in selected Alpine countries and regions.

Challenges

The literature screening and expert interviews provide insights into the underlying processes and challenges in regard to these quantitative land take reduction targets. Conclusions, however, should be drawn with caution considering the limited literature screening and small

basis of expert interviews. Therefore, the challenges identified in the literature screening and through expert interviews are only roughly differentiated into

- challenges that are perceived by a wider range of Alpine countries
- and challenges that at least based on the preliminary data collection seem to be perceived in a smaller range of or individual Alpine countries.

Challenges perceived by a wider range of Alpine countries	<ul style="list-style-type: none"> • Insufficient implementation of planning instruments and enforcement of regulations • Municipal planning authority and weighing of interests • Land hoarding • Individual housing preferences • Lack of administrative resources • Counterproductive incentives for land take • No binding reduction targets • Vacancies and brownfields (no standardised identification/activation) • Infrastructure projects (roads, renewable energies) • Secondary homes
Challenges perceived in individual Alpine countries	<ul style="list-style-type: none"> • Lack of monitoring • Cost-intensity of desealing • GDP coupled to land take • Reduction targets not regionalised • Fragmented competences • Lack of short- and medium-term action plan • Housing and commercial sub- and peri-urbanisation • Lower transaction costs for newly built homes • No cost transparency • Exceptions outside of building zones • Poor public transport access of land reserves • Outdated planning documents • Large share of land reserves for housing and commerce • Planning tool to safeguard open spaces complex • Administrative initiatives defeated in referendums • High degree of personal relationships • Lack of soil data

Thematically, the challenges can be categorised into four topics (see Table 6):

- Legal and financial framework, comprising planning competences, bindingness and regionalisation of reduction targets, and financial disincentives.
- Administrative factors, including implementation of planning procedures, staff resources and capacities and exceptions, partly due to personal relationships.
- Individual factors, comprising supply-related aspects of land hoarding, vacancies and land reserves as well as individual preferences in regard to main residences as well as secondary homes and the fact that initiatives for land-saving policies have been defeated in referendums.

- Concepts and data basis for decision-making, including action plans and up-to-date planning documents as well as lack of monitoring, soil data and cost transparency for new developments.

Table 6: Categorisation of challenges for land-saving targets in Alpine countries

Individual factors	Administrative factors	Legal and financial framework	Concepts and data basis for decision-making	Others
<ul style="list-style-type: none"> • Land hoarding • Individual housing preferences • Secondary homes • Vacancies and brownfields (no standardised identification/activation) • Housing and commercial sub- and peri-urbanisation • Large share of land reserves for housing and commerce • Administrative initiatives defeated in referendums 	<ul style="list-style-type: none"> • Insufficient implementation of planning instruments and enforcement of regulations • Lack of administrative resources • Exceptions outside of building zones • Complexity of planning tools to safeguard open spaces • High degree of personal relationships 	<ul style="list-style-type: none"> • Municipal planning authority and weighing of interests • Counterproductive incentives for land take • No binding reduction targets • Cost-intensity of desealing • GDP coupled to land take • Reduction targets not regionalised • Fragmented competences • Lower transaction costs for newly built homes 	<ul style="list-style-type: none"> • Outdated planning documents • Lack of short- and medium term action plan • Lack of monitoring • Lack of soil data • No cost transparency 	<ul style="list-style-type: none"> • Infrastructure projects (roads, renewable energies) • Poor public transport access of land reserves

While some factors such as insufficient implementation of planning instruments and enforcement of regulations, land hoarding, municipal planning authority, lack of administrative resources, individual housing preferences, counterproductive incentives for land take are considered challenges in more than half of the countries analysed, other issues are less widely perceived.

When looking at these challenges from the Alpine-wide perspective of the Alpine Convention, some are specifically embedded in a strictly domestic legal, financial or planning framework while others could potentially benefit from joint, bi- or multi-lateral efforts at the level of the Alpine Convention.

The latter potentially include the following challenges:

- **Lack of binding reduction targets:** While being a policy decision at national level, one interview partner pointed out the difficulties to reach acceptance for binding reduction targets when neighbouring countries are pursuing a voluntary approach. At the level of the Alpine Convention, awareness could be raised among individual Alpine countries about the importance of a consistent and binding land take reduction framework within the Alps and beyond.
- **Individual housing preferences:** This factor – together with the awareness for the benefits of brownfield development and vacancy activation – is already being addressed at the Alpine-wide level e.g. through Alpine projects and competitions such as Constructive Alps, SHELTER or Impulse4Action. These efforts can be continued as awareness-raising approaches and methods are usually transferable when adapted to specific contexts.
- **Lack of monitoring and administrative resources:** An exchange of experiences and good practices on monitoring (including standardised assessment tools for brownfields and vacancies, maintenance of brownfield and vacancy cadastres and needs

assessment for further zoning) across borders could be useful, thus also saving resources at the administrative level through transfer of knowledge and know-how.

- No cost transparency: Equally, first tools to assess costs of new development areas and how they are split between homeowners, municipalities and public service sector exist in individual Alpine countries⁶⁸. Lessons-learnt and promising communication strategies could be exchanged at the Alpine-wide level.
- Lack of soil data: Soil mapping methods and soil classification differ between Alpine states. In regard to a continuous soil information across national borders, these approaches could be harmonised, including also approaches how to address and weigh soil qualities in spatial planning procedures.

Summing up, all Alpine countries continue to address the unsustainable transformation of open spaces. Efforts have been stepped up in the recent decade, including the formulation of mostly non-binding land take reduction target and reduction trajectories. However, considering the limited effect these efforts continue to have on land take rates, a more closely aligned policy framework at supra-national level such as the Alpine Convention seems a promising (or even indispensable) option to reach a circular land use in the Alps and beyond as soon as possible.

⁶⁸ See Bavarian Follow-up cost calculator:
<https://www.lfu.bayern.de/umweltkommunal/flaechenmanagement/folgekostenschaetzer/index.htm>

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ANNEX 1: Questionnaire for Expert Interviews

BACKGROUND

As a contribution to the Alpine Climate Target System, this survey represents Step 3 of the Spatial Planning Implementation Pathway 1 “Alpine wide concept “Spatial Planning for Climate Action”” in the form of a survey on land saving targets and challenges. The first task was to assess which Alpine Convention states/countries have adopted land saving targets or are discussing them. The second to assess which challenges Alpine Convention states/countries face to reach their own land saving targets. The survey was supplemented with an overview of measures foreseen in the specific documents and the current land take in the Alpine countries and selected regions/federal states/provinces. The survey was based on a literature reviews and interviews with stakeholders.

<p>Step 3: Survey on land saving targets and challenges</p> <p>2021-2023</p>	<p>Which states/countries have adopted land saving targets (or are discussing them) and what are the biggest challenges to reach these aims? An Alpine-wide survey shall give answers to these questions.</p>
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Figure 19: Climate Action Plan 2.0 of the Alpine Climate Board, Description of Step 3 of the Spatial Planning Implementation Pathway 1

The Alpine Convention Working Group Spatial Planning and Sustainable Development adopted this task and included this step in its 2023/2024 mandate.

<p>2. ACTS 2050 implementation pathways contribution to the following steps:</p> <ul style="list-style-type: none"> • IP_SP1: Step 3: Alpine-wide survey on challenges land saving targets are facing in Alpine countries (based on the collection of land saving targets carried out in the mandate 2021/2022)
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Figure 20: Task according to the WG SPSD mandate 2023/2024

The cited collection of land-saving targets is a product of the 2021/2022 mandate of the WG SPSD.

Questionnaire

Overall situation

1. How would you describe the status-quo of quantitative land-saving efforts in your country, also in view of the mid- and long-term targets (2030 targets, 2050 (or prior) net zero land take)?

Achievements and lessons-learnt

2. Which significant steps have been taken in the recent past (strategies, legal framework, awareness, etc.)?
3. What approaches have been particularly effective? (in view of best-practices or blueprints for other Alpine countries)

Challenges

4. What are the three most important challenges for achieving land-saving targets in your country?
5. What additional challenges are land-saving efforts confronted with?

Outlook

6. From your perspective, what would be necessary next steps in your country?

Guidelines for Municipalities for Assessing and Activating Innerurban Development Potentials

***Contribution to IP_SP1_Step 4
of the Climate Action Plan 2.0***

**Spatial Planning and Sustainable Development Working Group
of the Alpine Convention**

Mandate 2023-2024



ALPENKONVENTION
CONVENTION ALPINE
ALPSKA KONVENCIJA
CONVENZIONE DELLE ALPI

IMPRINT

This report is a result of the Spatial Planning and Sustainable Development Working Group of the Alpine Convention mandate chaired by Germany.

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TASK

This task is intended to fulfil Step 4 of the Climate Action Plan 2.0 Implementation Pathway SP1 (citation): “Guidance for municipalities: A guidance for municipalities in the Alpine Convention Perimeter to analyse their potential for sustainable land use shall be developed based on existing approaches and tools. Internal development potential and balance of building land are crucial topics.” The agreement at the WG meeting was that “instead of drafting additional guidelines, this step comprises the collection of existing guidelines and their compilation on the WG website and possibly other AC platforms.”

RESULT

The guidelines, tools and other documents presented here are the result of a desktop research exercise that lasted until October 2023 and was led by German consultants of the Working Group. The national experts of the working group checked that the most relevant documents were included and suggested others until May 2024. The collection is not exhaustive, especially in countries with a federal planning system, each region tends to draft its own guidelines as the planning framework may partly differ from neighbouring regions.

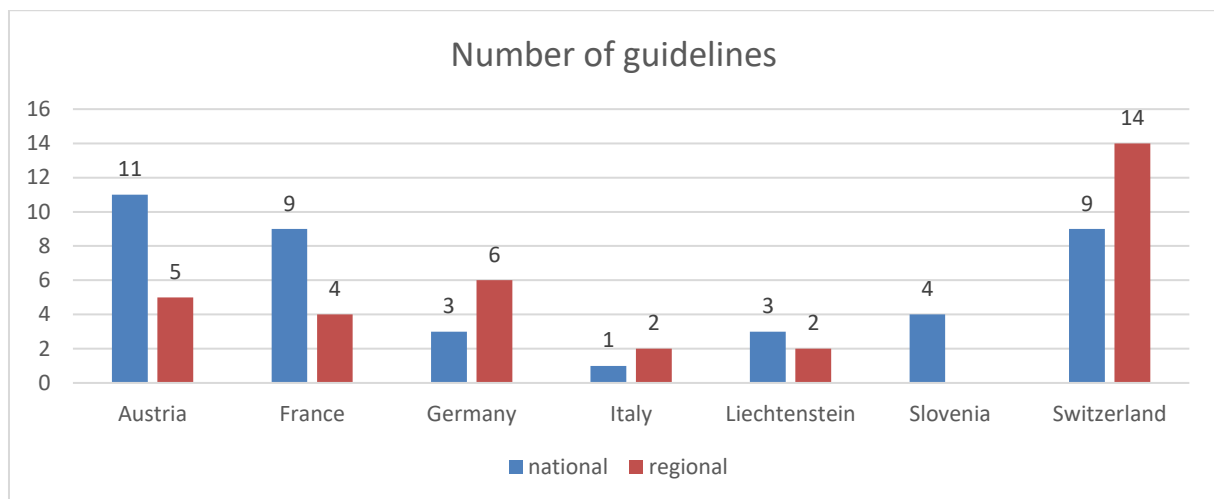


Figure 1: Number of national and regional guidelines per country

Figure 1 illustrates the number of documents which are presented in the following pages, in total 73.

A brief overview was created for each country, followed by a short factsheet for each individual document. The order of the countries corresponds to that in the figure.

Guidelines for inner development and land conservation Austria

The main source of Austria's high land take is urban sprawl. As a result, Austria strives for effective and practical land management in local and supra-local spatial planning. Therefore, numerous Austrian guidelines on inner development and land conservation have been developed to support this goal. The following register provides a non-comprehensive overview of current federal, regional and local guidelines for inner development with recommendations for action and examples of implementation. More detailed information can be found on the respective factsheets.

National Guidelines

[Klimabündnis Österreich, 2016: Bodenschutz/ Climate Alliance Austria, 2016: Soil protection](#)

An efficient and sustainable land and soil protection in municipalities is focus of this guide. The document contains a step-to-step introduction for municipalities with concrete measures, tips, practical examples, and further links.

[Bundesministerium für Land- und Forstwirtschaft, Umwelt und Wasserwirtschaft, 2015: Reduzierung des Verbrauchs landwirtschaftlicher Böden. Maßnahmenvorschläge/ Federal ministry of Agriculture, Forestry, Environment and Water Management, 2015: Reduction of the consumption of agricultural land. Proposed measures](#)

The guide provides measures to reduce the consumption of agricultural land. Among others, measures for legal land protection, for the area-wide evaluation of land function and for land awareness building are discussed. For each measure, examples, need for action and separate recommendations for policy are recorded.

[Ökosoziales Forum Österreich, 2017: Ökosozialer Bodenkompass. Ein Leitfaden für Bodenschutz und nachhaltiges Flächenmanagement im ländlichen Raum/ Ecosocial Forum Austria, 2017: Ecosocial Land Compass. A guide for land protection and sustainable land management in rural regions](#)

The guideline should inspire and motivate municipalities to promote land-saving developments in settlement areas. The document includes successful initiatives that demonstrate innovative solutions for saving land, which can be transferred to other municipalities.

[Österreichische Raumordnungskonferenz, 2017: ÖROK-Empfehlung Nr. 56: Flächensparen, Flächenmanagement & aktive Bodenpolitik/ Austrian Conference on Spatial Planning, 2017: ÖROK-recommendation Nr. 56: Reduced Land Use, Land Management & Active Land Policy](#)

The ÖROK recommendations about reducing land use, land management and active land policy are intended to encourage further responsible and active spatial planning in municipalities and regions.

[Bundesministerium für Nachhaltigkeit und Tourismus, 2019: Bodenverbrauch in Österreich. Status quo Bericht zur Reduktion des Bodenverbrauchs in Österreich/ Federal Ministry for sustainability and tourism, 2019: Land consumption in Austria. Status quo report for reduction of land consumption in Austria](#)

The current report documents measures and recommendations to reduce land consumption regarding thematic areas that are mainly under the responsibility of the Federal States.

[Österreichische Raumordnungskonferenz, 2019: Fachempfehlungen zur Stärkung von Orts- und Stadtkernen in Österreich. Rahmen, Empfehlungen und Beispiele/ Austrian Conference on Spatial Planning, 2019: Expert recommendations for strengthening town and village centres in Austria. Framework, recommendations and practical examples](#)

Ten expert recommendations for strengthening village and town centres in Austria. Concrete practical examples for application and implementation are provided.

[Österreichische Raumordnungskonferenz, 2023: ÖROK-Empfehlung Nr. 58: Raum für Baukultur. Orts- und Stadtkerne stärken sowie Raum für Baukultur eröffnen/ Austrian Conference on Spatial Planning, 2023: ÖROK Recommendation No. 58: Space for building culture. Strengthening town and city centers and opening up space for building culture](#)

The recommendations focus on strengthening architectural qualities as well as inner development, addressing funding issues, vertical and horizontal governance, legal structures of cooperation at federal state level, and awareness-raising and capacity building.

[Bodenstrategie für Österreich – Strategie zur Reduktion der weiteren Flächeninanspruchnahme und Bodenversiegelung bis 2030 / Soil Strategy for Austria – Strategy for the reduction of additional land take and soil sealing until 2030](#)

The soil strategy for Austria contains a collection of measures to pursue the following many objectives: Protection of natural and agricultural land, prevention of urban sprawl, efficient inner development and intensification of awareness-raising and public relations work.

Due to controversies around its land-saving target, the National Soil Strategy was adopted by the federal states in February 2024, which are responsible for spatial planning in Austria, without the federal government. Nevertheless, the federal government, the Länder, cities and municipalities are working together to implement the measures of the strategy.

[Bundesministerium für Land- und Forstwirtschaft, Regionen und Wasserwirtschaft, 2024: Festlegung landwirtschaftlicher Vorrangzonen in Österreich. Fachgutachten der AG „quantitativer Bodenschutz“ des Fachbeirates für Bodenfruchtbarkeit und Bodenschutz im BML/ Federal Ministry of Agriculture, Forestry, Regions and Water Management, 2024: Definition of agricultural protection zones in Austria. Expert report of the working group “Quantitative Soil Protection” of the Advisory Board for Soil Fertility and Soil Protection at the BML](#)

The guidelines were developed in cooperation with the federal states, who can determine agricultural protection zones within their competence for spatial planning. Not all of them have implemented this form of zoning in their spatial planning law.

[BMK Webseite Brachflächendialog, / Federal ministry for Climate Action, Environment, Energy, Mobility, Innovation and Technology \(BMK\) and Federal Environment Agency: Brownfield dialogue](#)

The brownfields dialog is a multi-year process with the aim of bringing vacant and underused sites (brownfields) back into use. The aim is to achieve more efficient land use and make a significant contribution to reducing land consumption.

Regional Guidelines

[Österreichischer Städtebund, 2014: Weißbuch Innenstadt. Chancen und Herausforderungen für Klein und Mittelstädte/ Association of Austrian Cities, 2014: White paper city center. Opportunities and challenges for small and medium-sized cities](#)

The white paper examines the problems of centre development in small and medium-sized towns. It presents experience patterns, options for action and best practice examples that can be used as a basis for projects in other regions. Additionally, suggestions are made at the national level to support inner city development moving forward.

[Amt der Niederösterreichischen Landesregierung, 2017: Mehr innen heißt gewinnen! Innenentwicklung als Chance zur Ortskernbelebung/ Government of Lower Austria, 2017: More inner means winner! Inner development as an opportunity to revitalize the town center.](#)

A compact folder that shows the necessity and opportunities of inner development, as well as specific steps to encourage the process.

[Amt der Vorarlberger Landesregierung, 2018: Innenentwicklung und bauliche Verdichtung. Beiträge zu Planungsstrategien/ Government of Vorarlberg, 2018: Inner development and structural densification. Contributions to planning strategies.](#)

The report describes and analyses various types of settlement and their potential for densification. In addition, eleven examples of structural densification in the Rhine Valley and Walgau are documented.

[Amt der Tiroler Landesregierung, 2018: Das Projekt Ortskern Revitalisierung am Beispiel Silz/ Government of Tyrol, 2018: The project village revitalization using the example of Silz](#)

This document gives an insight into the project "Revitalization of village centre Silz" and shows its path from the beginning. It contains not only the results of the project, but also the thoughts and strategies behind it. This book should be a help for other communities to implement their strategy for revitalization of village centres.

[Salzburger Institut für Raumordnung und Wohnen, 2022: Infrastrukturkosten in der Siedlungsentwicklung/ Department for regional development and housing in Salzburg, 2022: Infrastructure costs for settlement development.](#)

The guideline examines infrastructure costs that arise from different strategies of residential development and building structures. It provides information for potential cost and land savings for municipalities.

[Land Oberösterreich Aktionsprogramm Leerstands- und Brachflächenrevitalisierung, Orts- und Stadtkernbelebung, ongoing / Upper Austrian action programme for the revitalization of vacant and derelict sites, town and city centre revitalization](#)

By activating vacancies and brownfields, the province of Upper Austria aims to support the revitalization of towns and city centres and, in accordance with the Upper Austrian spatial planning strategy, to promote the possibility of inward settlement development. There is a coordination office in the Spatial Planning Department as a permanent point of contact for the funding program

Bodenschutz

Soil protection



Leitfaden Klimaschutz in Gemeinden
BODENSCHUTZ

Das Kapitel „Bodenschutz“ ist Teil des Leitfadens „Klimaschutz in Gemeinden“. Dieser wurde vom Europäischen Ökoinstitut im Auftrag des Bundesministeriums für Land- und Forstwirtschaft, Umwelt und Wasserwirtschaft, in Zusammenarbeit mit dem Österreichischen Klimabündnis, entwickelt. Download oder Kopie des Leitfadens „Klimaschutz in Gemeinden“: www.oekoinstitut.at/leitfaden

Publisher: Klimabündnis Österreich im Auftrag des Bundesministeriums für Land- und Forstwirtschaft, Umwelt und Wasserwirtschaft

Publication Date: 2016

Link: [Bodenbündnis Österreich](http://www.bodenbueundnis.at)

Summary

Compact settlement structures are becoming more significant in a globalized economy since they create opportunities for competitive advantages. Additionally, the economical use of land is a top priority when it comes to tackling climate change. Climate protection is a result of all actions that use minimal new land and care for the land that already exists. As a result, the short and medium-term targets are to use as little further land as possible. In long term, the goal will be to stop using new land at all and to persist with existing land resources for development. Some very important ways to do this are included in the guide. The following steps are described along with suggested measures, advice and best-practice examples:

- Step 1: Reconsider a fundamentally new approach and access to land in your community.
- Step 2: Pass the "Municipal Land Protection Officer" program
- Step 3: Become a soil alliance municipality
- Step 4: Organize soil awareness events in your municipality
- Step 5: Create compact settlement structures and revitalize village centres
- Step 6: Improve the quality of public and private green spaces and create additional green spaces

Target Group

- Local level
- Regional level
- Project developer
- Private persons
- Others

Key Topics

- Inner development
- Land protection
- Climate protection
- Land Alliance
- Communication and participation
- Awareness Building
- Good practice

Instruments

- Step-for-step guide to reduce land use

Main target of the guideline is ...

An efficient and sustainable land and soil protection in municipalities is focus of this guide. The document contains a step-to-step introduction for municipalities with concrete measures, tips, practical examples, and further links.

Reduzierung des Verbrauchs landwirtschaftlicher Böden. Maßnahmenvorschläge.

Reduction of the consumption of agricultural land. Proposed measures.



Publisher: Bundesministerium für Land- und Forstwirtschaft, Umwelt und Wasserwirtschaft

Publication Date: 2015

Link: <https://info.bml.gv.at/dam/jcr:0cfe5524-ddb1-4fea-9058-dc4b3273ee2a/Reduzierung%20des%20Verbrauchs%20landwirtschaftlicher%20B%20den%20-%20Ma%C3%9Fnahmenvorschl%C3%A4ge.pdf>

Target Group

- Local level
- Regional level
- Project developer
- Private persons
- Others

Key Topics

- Preservation of agricultural land
- Inner development
- Land policy
- Awareness building
- Instruments and measures

Summary

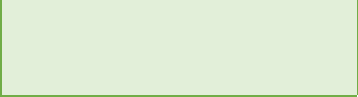
Land and Soils fulfil a variety of functions. Land is subject of constant and increasing demand. It serves as living space, a side for homes and infrastructure, a source of raw materials and, most importantly, is basis for our food supply. Unsealed land also delivers a significant contribution to climate and water protection, disaster prevention and the preservation of biodiversity. Unsealed land also makes a substantial contribution to biodiversity preservation, disaster prevention, and the protection of the climate and water resources. Land is an essential component of our natural and cultural landscape and the basis of our living environment.

On behalf of the Federal Ministry for Agriculture, Forestry, Environment and Water Management and the State Conference of Agricultural Professionals, experts have addressed the issue of rising land consumption and therefore the land loss for agriculture.

The publication deals with the problems of land consumption and the demands on agricultural land. In order to minimize or reduce the usage of agricultural land, measures and recommendations for politicians are developed. The following measures to reduce land use of agricultural soils are discussed:

- Laws for comprehensive quantitative land and soil protection
- Area-wide applications for the evaluation of soil functions
- Awareness building
- Soil conservation by type: conservation value targets and monitoring
- Application and development of measures for land-saving spatial development
- Avoiding natural compensation and replacement measures on qualitative agricultural land

Particular attention is paid to existing regulations, initiatives and examples. In addition, an assessment of the proposed implementation measures is made in regard to terms of time, costs/effort and the legal framework as well as responsibilities. The amount of work necessary to implement the suggested measures varies widely. However, the expert



group claims that some of the measures can be implementable with little difficulty and bring meaningful improvements.

Instruments

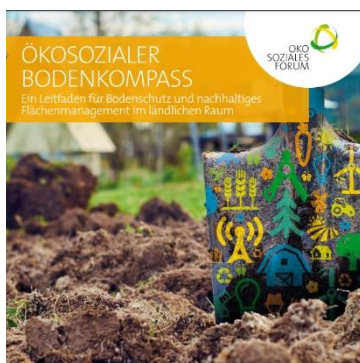
- Assessment tool for planned measures

Main target of the guideline is ...

The guide provides measures to reduce the consumption of agricultural land. Among others, measures for legal land protection, for the area-wide evaluation of land function and for land awareness building are discussed. For each measure, examples, need for action and separate recommendations for policy are recorded.

Ökosozialer Bodenkompas. Ein Leitfadn für Bodenschutz und nachhaltiges Flächenmanagement im ländlichen Raum

Ecosocial Land Compass. A guide for land protection and sustainable land management in rural regions



Publisher: Ökosoziales Forum Österreich

Publication Date: 2017

Link: [Bodenbündnis Österreich \(bodenbuendnis.or.at\)](http://bodenbuendnis.or.at)

Target Group

- Local level
- Regional level
- Project developer
- Private persons
- Others

Key Topics

- Inner development
- Land protection
- Climate protection
- Awareness building
- Land Alliance
- Communication and Participation
- Good practice

Summary

In Austria, 16 hectares land are consumed every day. Particularly municipalities are dealing with significant problems related to land consumption. In-migration and growing demands in terms of infrastructure increase the need for land in local areas.

An eco-social municipal policy is needed to balance the competing demands and interests. Wise planning enables qualitative and quantitative land protection and, at the same time, ensures attractive structures in rural areas. The key principle of an eco-social market economy - long-term planning - also demonstrates its value.

The Eco-social Community Compass compiles the best examples from across Austria and offers advice and recommendations for implementation in one's own locality - starting with professional training for decision-makers and awareness-raising in schools, through inter-municipal cooperation, to mobilization of building land and strengthening of local centres.

Instruments

Main target of the guideline is ...

The guideline should inspire and motivate municipalities to promote land-saving developments in settlement areas. The document includes successful initiatives that demonstrate innovative solutions for saving land, which can be transferred to other municipalities.

ÖROK-Empfehlung Nr. 56: Flächensparen, Flächenmanagement & aktive Bodenpolitik



ÖROK-recommendation Nr. 56: Reduced Land Use, Land Management & Active Land Policy



Publisher: Geschäftsstelle der Österreichischen Raumordnungskonferenz (ÖROK)

Publication Date: 2017

Link: https://www.oerok.gv.at/fileadmin/user_upload/Bilder/2.Reiter-Raum_u_Region/1.OEREK/OEREK_2011/PS_Flaechensparen/OeROK-Empfehlung_56_Flaechensparen_Internet.pdf

Target Group

- Local level
- Regional level
- Project developer
- Private persons
- Others

Key Topics

- Reduction of land use
- Land management
- (Regional) Land policy
- Land mobilization
- Inner development
- Good practice

Summary

Current developments, such as the rapid population growth in many regions of Austria, rising prices on the real estate market but also changing lifestyles, which often go hand in hand with a higher demand for space, promoted the discussion to develop recommendations for land saving and viable spatial planning regarding active land policy, land management and land savings in Austria. All levels (local, municipal and regional) are jointly challenged to develop long-term planning strategies for land management and to implement them consistently through differentiated (conceptual or binding) planning instruments.

The document provides a common guideline of the ÖROK members with introductory "framing" information and eight concrete ÖROK recommendations on land saving, land management & active land policy.

The recommendations are:

- Land saving and land management as a central planning concern
- Improved implementation and practical relevance
- Supra-local spatial planning as a key planning level
- Effective local spatial planning
- Coordinated measures for mobilizing building land
- Vacancy management, mobilization of commercial and industrial brownfields and internal densification
- Creation of up-to-date information and data bases
- Saving land as a principle that applies across all disciplines

Examples are provided to illustrate how the recommendations can be implemented in practice at municipal and regional level.

Instruments

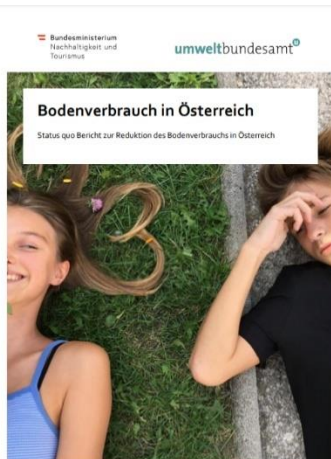
- NÖ Infrastrukturkostenkalkulator – Infrastructure cost calculator of lower Austria to evaluate expected costs for settlement expansion

Main target of the guideline is ...

The ÖROK recommendations about reducing land use, land management and active land policy are intended to encourage further responsible and active spatial planning in municipalities and regions.

Bodenverbrauch in Österreich. Status quo Bericht zur Reduktion des Bodenverbrauchs in Österreich

Land consumption in Austria. Status quo report for reduction of land consumption in Austria.



Publisher: Bundesministerium für Nachhaltigkeit und Tourismus, Sektion VII Tourismus und Regionalpolitik

Publication Date: 2019

Link: <https://info.bml.gv.at/dam/jcr:0d5df73f-114b-447d-8186-cbf0d68fbc3e/Studie%20UBA%20Bodenverbrauch.pdf>

Target Group

- Local level
- Regional level
- Project developer
- Private persons
- Others

Key Topics

- Land consumption
- Regional land policy
- Valuable land protection
- Housing subsidy
- Awareness building
- Brownfields and vacant buildings
- Instruments and measures

Summary

As a small country with limited land resources - and an even more limited permanent settlement area - Austria faces today the challenge of using land much more efficiently in future than it did in the past.

Austria is not alone in this task. At the EU and global level, exists an agreement to achieve zero net land degradation by 2050. Simply, this means that by 2050 maximum use must be made of recycled land that has already been used. New land development must be avoided and unavoidable land development must be compensated for.

Reducing land use is a cross-cutting issue and should be recognized as a common goal by both, the general public and the sectors concerned. There are no patent solutions. Rather, progress must be achieved through the implementation of a wide variety of measures from a wide range of subject areas.

The publication provides information on current developments and on measures, that have proven particularly successful in practice. Furthermore, the study also offers suggestions on how to reduce land use over long term and which topics need to be strengthened for going forward. Thematic areas are protection of natural resources, vital village centres, building land mobilization, housing subsidies, education and expert knowledge, vacant buildings and new planning instruments.

Instruments

Main target of the guideline is ...

The current report documents measures and recommendations to reduce land consumption regarding thematic areas that are mainly under the responsibility of the Federal States.

Fachempfehlungen zur Stärkung von Orts- und Stadtkernen in Österreich. Rahmen, Empfehlungen und Beispiele

Expert recommendations for strengthening town and village centres in Austria. Framework, recommendations and practical examples



Publisher: Geschäftsstelle der Österreichischen Raumordnungskonferenz (ÖROK)

Publication Date: 2019

Link: https://www.oerok.gv.at/fileadmin/user_upload/Bilder/2.Reiter-Raum_u_Region/1.OEREK/OEREK_2011/PS_Orts_Stadtkerne/BROSCHUERE_FINAL_Fachempfehlungen_Ortskerne_gedruckt.pdf

Summary

The attractiveness of village and town centres as residential, commercial and local supply centres seems to dwindle inexorably. Little-used public space and the vacancy of many (commercial) buildings characterizes the image of many places today. Strengthening and revitalizing village and town centres is therefore one of the most important issues for sustainable spatial development, for maintaining the quality of life for the residents and, in many areas, for tourism. Vital village and town centres are not only essential for high living and economic standards, but also to save land, make wise use of already-existing structures, reduce individual traffic, and meet climate goals.

Therefore, ten expert recommendations for enhancing town and village centres were developed:

1. To implement and enhance town and village centres in legislation
2. To establish and expand suitable organizational structures to strengthen town and village centres
3. To create town and village centre delineations
4. To create integrated urban development concepts or comparable concepts
5. To consider empowering town and village centres in a regional context
6. To inform and participate population to strengthen town and village centres
7. To sensitize and activate private actors as collaborators to enhance town and village centres
8. To strive for increased subsidies for the creation of living space in town and village centres
9. To secure and expand businesses and facilities in town and village centres

To ensure professional support in questions of building culture in the town and village centres.

Target Group

- Federal level
- Local level
- Regional level
- Project developer
- Private persons
- Others

Key Topics

- Inner development
- Strengthening of village centres
- Land policy
- Organization structures
- Instruments and measures
- Communication and participation
- Land mobilization
- Funding
- Building culture

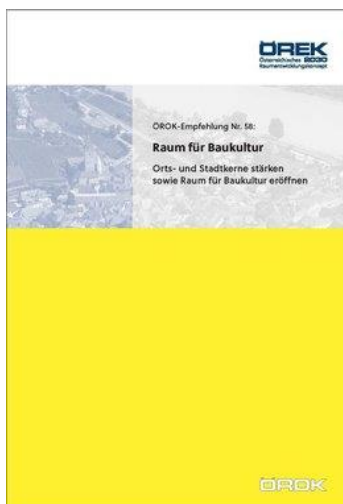
Instruments

Main target of the guideline is ...

The current report documents measures and recommendations to reduce land consumption regarding thematic areas that are mainly under the responsibility of the Federal States.

ÖROK-Empfehlung Nr. 58: Raum für Baukultur – Orts- und Stadtkerne stärken sowie Raum für Baukultur eröffnen

ÖROK recommendation No. 58: Space for building culture. Strengthening town and city centres and opening up space for building culture



Publisher: Geschäftsstelle der Österreichischen Raumordnungskonferenz (ÖROK)

Publication Date: 2023

Link: [Österreichische Raumordnungskonferenz - Raum für Baukultur \(oerok.gv.at\)](https://oerok.gv.at)

Summary

ÖROK-Recommendations for strengthening building culture as well as inner development:

A) Recommendations on funding for building culture and strengthening town and city centres:

- Consistently apply a catalogue of building culture quality criteria for relevant federal and state funding
- Utilize existing public funds for the promotion of building culture and strengthening of town and city centres
- Establish an integrated funding management system for funding applicants
- Use public participation as a standard in planning and construction

B) Recommendations for the further development of vertical and horizontal governance:

- Establish an effective cooperation system between the federal government and the federal states
- Consolidate the existing organizational unit in the department responsible for Baukultur as a contact point for Baukultur and for strengthening town and city centres
- Establish or further develop efficient Baukultur clusters in all federal states as counterparts for the federal government according to common standards

C) Recommendation on the legal structure of federal-state cooperation:

- Relevant legal instruments for the organization of federal-state cooperation in the cross-sectional field of Baukultur should be used to the best possible effect

D) Recommendations for awareness-raising and capacity building:

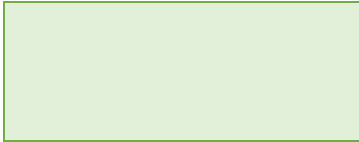
- Create training opportunities for people working in the field of building culture, in particular for politicians, administrators and

Target Group

- Local level
- Regional level
- Federal level
- Project developer
- Private persons
- Others

Key Topics

- Building culture
- Inner development
- Organization structures
- Communication and participation
- Funding system



planners, and also strengthen relevant educational institutions in the field of building culture across the board

- Raise awareness of building culture issues in society

Instruments

Setting up organizational framework for managing subsidies, as well as awareness-raising and capacity building

Main target of the guideline is ...

strengthening building culture as well as village and town centres in Austria through improving existing instruments and setting up a service oriented organizational framework for managing subsidies ("one-stop-shop").

Bodenstrategie für Österreich – Strategie zur Reduktion der weiteren Flächeninanspruchnahme und Bodenversiegelung bis 2030



Soil Strategy for Austria. Strategy for the reduction of further land take and soil sealing until 2030



Publisher: Geschäftsstelle der Österreichischen Raumordnungskonferenz (ÖROK)

Publication Date: 2023

Link: [Österreichische Raumordnungskonferenz - Bodenstrategie für Österreich \(oerok.gv.at\)](https://oerok.gv.at)

Target Group

- Local level
- Regional level
- Federal level
- Project developer
- Private persons
- Others

Key Topics

- Reduction of land take
- Soil sealing
- Instruments and measures
- Communication and participation
- Land mobilization
- Settlement development control
- Preservation of agricultural land
- Inner development
- Land management
- Monitoring land use

Summary

The soil strategy for Austria was developed by the federal ministries, states, Association of Cities and Towns and the Association of Municipalities. It was adopted in 2024 by the federal states, within their responsibility for spatial planning.

The Strategy contains a collection of measures to pursue the following many objectives:

- Protection of natural and agricultural land
- Prevention of urban sprawl
- Efficient inner development
- Intensification of awareness-raising and public relations work

Part of the Strategy is an action plan for working on and developing further measures within the ÖROK:

1. Definition of agricultural protection zones
2. Determining the area required for agricultural production as a contribution to food security
3. Definition of quantitative target values and area quotas
4. Adaptation of financial instruments
5. goal-oriented communication and public relations work
6. Reduction of surplus building land in outer areas
7. Restrictions on area-intensive land uses
8. Compensation for land take
9. Improvement of land acquisition and land availability
10. Monitoring of land consumption
11. Monitoring of soil sealing
12. Progress reports on the soil strategy

As a first result of the soil strategy the monitoring of land use and soil sealing was put into operation in 2023. It provides exact and reliable data about the status quo beginning with data from 2022 and will be updated every three years.

- Monitoring soil sealing

Instruments

Toolbox of different spatial planning as well as financial instruments and subsidies

Main target of the guideline is ...

"The joint project of the federal government, states, cities and municipalities is the substantial reduction of further land use by settlement and transport areas as well as newly sealed areas by 2030."

Festlegung landwirtschaftlicher Vorrangzonen in Österreich. Fachgutachten der AG „quantitativer Bodenschutz“ des Fachbeirates für Bodenfruchtbarkeit und Bodenschutz im BML



Definition of agricultural protection zones in Austria. Expert report of the working group “Quantitative Soil Protection” of the Advisory Board for Soil Fertility and Soil Protection at the BML



Publisher: Federal Ministry of Agriculture, Forestry, Regions and Water Management (BML)

Publication Date: 2024

Link: [Festlegung landwirtschaftlicher Vorrangzonen in Oesterreich BF.pdf \(bml.gv.at\)](https://www.bml.gv.at/Bilder/Doc/2024/01/20240128_Festlegung_landwirtschaftlicher_Vorrangzonen_in_Oesterreich_BF.pdf)

Summary

One measure within the Austrian soil strategy is the “designation of agricultural priority zones” for the “protection of open land and grassland”. This is a planning content of supra-local spatial planning, which is intended to secure selected agricultural land for agricultural use in the long term. The instrument sets out corresponding requirements for the municipalities with regard to their zoning activities.

There are few legal obstacles to the designation of agricultural priority zones in supra-local spatial plans under spatial planning law, provided that the respective demarcations can be objectively argued.

The Advisory Board for Soil Fertility and Soil Protection was asked by ÖROK to survey the status quo in Austria in this regard and to develop a method proposal that could be applied throughout Austria. The work of this working group was finalized and published at the beginning of 2024.

Target Group

- State level
- Regional level
- Local level
- Project developer
- Private persons
- Others

Key Topics

- Reduction of land take
- Instruments and measures
- Settlement development control
- Preservation of agricultural land

Instruments

Agricultural priority zones

Main target of the guideline is ...

To implement general rules for determining agricultural protection zones in Austria in state or regional level spatial planning.

Brachflächen-Dialog

Website *Brownfield dialog*

brachflächen
dialog



Der Brachflächen-Dialog ist ein mehrjähriges Programm des BMK mit dem Ziel, leerstehende und untergenutzte Standorte (kurz Brachflächen) wieder in die Nutzung zu bringen. Damit wird ein Beitrag zur Reduktion des Flächenverbrauchs und zur Erhaltung biologisch produktiver Böden geleistet.



Publisher: Federal ministry for Climate Action, Environment, Energy, Mobility, Innovation and Technology (BMK) and Federal Environment Agency)

Publication Date: Website ongoing

Link: <https://www.brachflaechen-dialog.at/>

Summary

The brownfields dialog is a multi-year process with the aim to achieve more efficient land use and make a significant contribution to reducing land consumption.

The focus is on Austria-wide cooperation between experts. The Brownfields Dialogue is a central hub for land recycling activities in Austria. The goals of the brownfields dialog are:

- To develop instruments for the survey and reuse of brownfields,
- to make best practice examples visible and
- raise awareness of the topic.

All stakeholders involved are addressed, such as industry and commerce, federal, state and municipal administration, state, regional and municipal politics, location developers, business agencies, the real estate industry, regional, city and local planners, interest groups such as the Association of Towns and Municipalities, the financial sector and investors.

Part of the dialogue are diverse activities, such as webinars, advice on funding and project planning, a brownfields summit every 1½ years, nationwide networking as a regular meeting of experts from the federal and state governments and expert working groups on specific topics.

Target Group

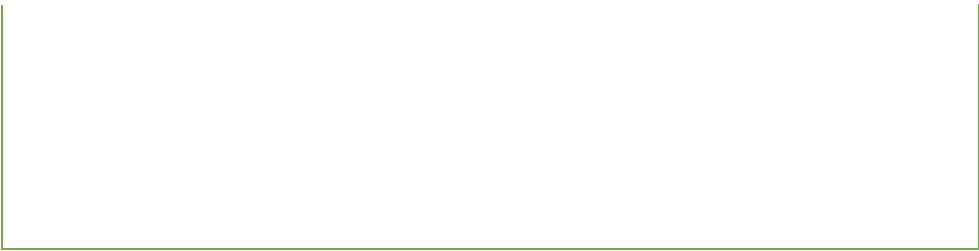
- State level
- Regional level
- Local level
- Project developer
- Private persons
- Others

Key Topics

- Awareness rising with meetings, webinars,

excursions, best practice collection, exchange of knowledge

- Expert working groups



Instruments
Conferences, funding options, networking and exchange

Main target of the guideline is ...
To inform about possibilities for brownfield activation.

Weißbuch Innenstadt. Chancen und Herausforderungen für Klein und Mittelstädte

White paper city centre. Opportunities and challenges for small and medium-sized cities.



Publisher: Österreichischer Städtebund. Landesgruppe Steiermark

Publication Date: 2014

Link: https://news.wko.at/news/steiermark/Weissbuch_Innenstadt_Stand_159.pdf

Summary

The White Paper examines the problems of city centre development in small and medium-sized towns away from the large metropolitan areas. It is a compilation of experience patterns, strategies for measures and options for action, which were developed by an interdisciplinary project team for the Styrian pilot regions Bruck an der Mur, Hartberg and Bad Radkersburg. The analysis of these three municipalities has clearly shown the diversity and difference of the framework conditions and problems in questions of town centre development and revitalization.

It is evident from comparing the three municipalities under investigation, that there are no patentable solutions to the issues. Thus, it is best to think of the recommendations for action as a collection of possible option of action that can serve as basis for specific concepts of measures for towns with a population of up to 25,000. Where improvements to the framework conditions could be identified at state or federal levels, they were noted individually in respective recommendations.

Target Group

- Local level
- Regional level
- Project developer
- Private persons
- Others

Key Topics

- Inner development
- City development
- Revitalization
- Vacant buildings
- Public land
- Good practice

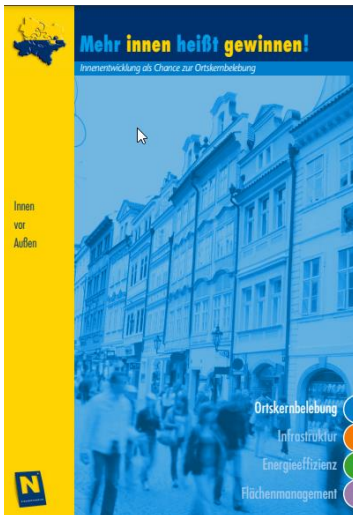
Instruments

Main target of the guideline is ...

The white paper examines the problems of centre development in small and medium-sized towns. It presents experience patterns, options for action and best practice examples that can be used as a basis for projects in other regions. Additionally, suggestions are made at the national level to support inner city development moving forward.

Mehr innen heißt gewinnen! Innenentwicklung als Chance zur Ortskernbelebung

More inner means winner! Inner development as an opportunity to revitalize the town centre.



Publisher: Amt der Niederösterreichischen Landesregierung. Abteilung Raumordnung und Regionalpolitik

Publication Date: 2017

Link: https://www.raumordnung-noe.at/fileadmin/root_raumordnung/gemeinde/oertliche_raumordnung/planungstools/Folder_Innenentwicklung.pdf

Summary

A healthy and smart municipality means lively centres, well-utilized infrastructure, a wide range of goods and services, quality of life, short distances, good accessibility, secured offers and services. This requires a development strategy that prioritizes inner development in settlements. The strategy "*inside before outside*" is a first step to control the land consumption and serves as a planning principle for municipalities. It keeps the well-being of people in mind as well as efficient and effective development.

The folder describes the importance, necessity, advantages and opportunities of inner development. It outlines the following 4 steps for inner development:

1. Survey of development potentials in the inventory
2. Create a real estate brochure
3. Create a vision (idea)
4. Integration of all relevant actors

In addition, advices and further municipality-related data are provided.

Target Group

- Local level
- Regional level
- Project developer
- Private persons
- Others

Key Topics

- Inner development
- Development potential
- Real estate exchange
- Communication and participation

Instruments

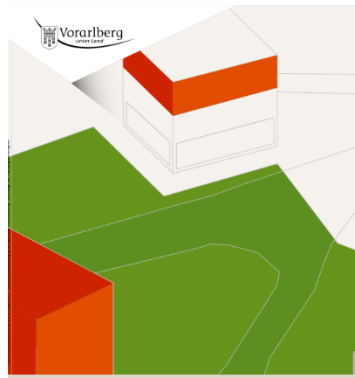
- Flächenmanagent-Datenbank (FMD) – FMD-Database to assess inner-urban potentials, including resealing potentials
- NÖ Infrastrukturkostenkalkulator – Infrastructure cost calculator of lower Austria to evaluate expected costs for settlement expansion

Main target of the guideline is ...

A compact folder that shows the necessity and opportunities of inner development, as well as specific steps to encourage the process.

Innenentwicklung und bauliche Verdichtung. Beiträge zu Planungsstrategien

Inner development and structural densification. Contributions to planning strategies.



32 Innenentwicklung
und bauliche Verdichtung
Beiträge zu Planungsstrategien

Publisher: Amt der Vorarlberger Landesregierung. Abteilung Raumplanung und Baurecht

Publication Date: 2018

Link: https://vorarlberg.at/documents/302033/472281/Schriftenreihe+32+Innenentwicklung+und+bauliche+Verdichtung_2018.pdf/cb86c5c8-12ff-fe64-57ee-99c50a291f33

Summary

In the region of Vorarlberg, the demand for living space is constantly increasing. In order to be able to maintain the outer border of the settlement and at the same time create a larger housing supply, two strategies are needed which complement each other: inner-local re-densification and the upgrading of public space. Based on these considerations, the region of Walgau, together with the Department of Spatial Planning and Building Law, has carried out a pilot project to put these two strategies into practice.

As a result, the project report "*Interior Development and Structural Compaction - Contributions to Planning Strategies*" has been produced, in which, different types of settlement and compaction are described and analysed. The different types of settlement are defined by their location in space (village centre, intermediate area, village border, dispersed settlement), which need different strategies for densification. The report provides examples for all settlement types from the Rhine Valley and Walgau. Most of them are fictitious plans for a specific area, which were prepared within the project.

However, studies and projects by other authors at different stages of realization have also been integrated to increase the range of examples. Among the eleven examples are the structural compaction in scattered settlements in Dünserberg - Bassig, the compaction in the centre of the village modernization of old buildings in Schnifis - "Abbrandhäuser" and the re-densification in multi-floor-buildings in Bludenz - "Südtiroler Siedlung".

Target Group

- Local level
- Regional level
- Project developer
- Private persons
- Others

Key Topics

- Inner development
- Redensification
- Settlement structures
- Good practice
- Communication and participation

Instruments

Main target of the guideline is ...

The report describes and analyses various types of settlement and their potential for densification. In addition, eleven examples of structural densification in the Rhine Valley and Walgau are documented.

Das Projekt Ortskern Revitalisierung am Beispiel Silz

The project village revitalization using the example of Silz



Publisher: Amt der Tiroler Landesregierung - Dorferneuerung Tirol

Publication Date: 2018

Link: https://www.tirol.gv.at/fileadmin/themen/land-forstwirtschaft/agrar/dorferneuerung-tirol/Downloads_Neu/Buch_Projekt_OKR_Silz.pdf

Target Group

- Local level
- Regional level
- Project developer
- Private persons
- Others

Key Topics

- Revitalization of village centre
- Vacancies management
- Inner development
- Good practice

Summary

The book "The project - village centre revitalisation using the example of Silz" gives an insight into the project "village centre revitalisation Silz" and shows its path from the beginning. It contains not only the results of the project, but also the thoughts and strategies behind it. This book should give support to other municipalities to implement their village revitalization strategy.

The municipality of Silz is located in the district of Imst in the region of Tyrol, with an area of 65.62 km² and has 2,564 inhabitants (as of 01.01 2019). Already 20 years ago, the municipality recognized the vacancy problem in the town centre. In 2001 there were 81 vacant buildings in the centre of the municipality of Silz (about 1/3 of the existing properties). In 2004, the starting signal for the Tyrolean pilot project "Revitalisation of Silz village centre" was given. In the project, the municipality focused on raising awareness of the construction quality of old buildings, citizen participation, a professional analysis of the local conditions with subsequent preparation of local guidelines to ensure continuity in appearance, public relations work and free advice for the building owners. In the project (2004-2016) 60 consultations were carried out and 36 old buildings were revitalized, creating 59 new housing units. By revitalizing old buildings, new building land and the associated development and maintenance costs can be saved.

Instruments

Main target of the guideline is ...

This document gives an insight into the project "Revitalization of village centre Silz" and shows its path from the beginning. It contains not only the results of the project, but also the thoughts and strategies behind it. This book should be a help for other communities to implement their strategy for revitalization of village centres.

Infrastrukturkosten in der Siedlungsentwicklung

Infrastructure costs for settlement development.



Publisher: Salzburger Institut für Raumordnung und Wohnen

Publication Date: 2022

Link: https://www.salzburg.gv.at/bauenwohnen/~/Documents/Publikationen/Infrastrukturkostenstudie%202021_Leitfaden.pdf

Summary

Infrastructure costs and settlement development are closely related and should always be seen in context. From construction through operation and maintenance to potential renewal, foresightful and careful planning about the location of the building area as well as the kind and density of construction can have a significant positive impact on the level of infrastructure cost.

The aim should be to link the demand for housing to the existing building stock and to achieve moderate densification. The "inside before outside" planning tenet ought to take precedence.

The guideline "*Infrastructure costs for settlement development*" serve as information and training material, as food for thought for decision-makers in the municipality and as an argumentation aid in persuading the public.

Therefore, the following key messages should be considered:

- Internal before external development
- Compact settlement structures
- Actively manage settlement development

Target Group

- Local level
- Regional level
- Project developer
- Private persons
- Others

Key Topics

- Inner development
- Infrastructure costs
- Settlement structures
- Settlement development control
- Settlement development costs

Instruments

Main target of the guideline is ...

The guideline examines infrastructure costs that arise from different strategies of residential development and building structures. It provides information for potential cost and land savings for municipalities.

Aktionsprogramm Leerstands- und Brachflächenrevitalisierung, Orts- und Stadtkernbelebung

Action programme for the revitalization of vacant and derelict sites, town and city centre revitalization.



Publisher: Land Oberösterreich

Publication Date: ongoing

Link: <https://www.land-oberoesterreich.gv.at/285145.htm>

Summary

A coordination office for vacancies and brownfield revitalization has been set up in the Spatial Planning Department to strengthen networking activities in this field.

It offers advice and service for municipalities and informs about incentive programmes.

Target Group

- Local level
- Regional level
- Project developer
- Private persons
- Others

Key Topics

- Inner development
- Settlement development control
- Settlement development costs

Instruments

Main target of the guideline is ...

To offer a service point for municipalities.

Guidelines for inner development and land conservation France

With the Climate and Resilience Law France strives for a Zero net land take by 2050. Numerous French guidelines on inner development and land conservation have been developed to support this goal. The following register provides an overview of current Federal and Local guidelines for inner development with recommendations for action and examples of implementation. More detailed information can be found on the respective factsheets.

National Guidelines

[Direction Urbanisme et territoires et service Habitat de l'Eurométropole de Strasbourg, 2018: Vacance des logements. Stratégies et méthodes pour en sortir /Department of Urban Planning and territories and Housing Department of the Eurometropolis of Strasbourg, 2018: Vacant housing. Methods and strategies for getting out of it.](#)

The aim of this guide is to mobilize municipalities to act against vacancy. The guide provides methodological bases for the implementation of public territorial policies adapted to local realities.

[ANCT, DGALN, PUCA, 2021: Territoires pilotes de sobriété foncière: Guide de la démarche/ National Agency for Territorial Cohesion, Department of Housing, Urban Planning and Landscapes, Urbanism Construction Architecture Plan, 2021: Pilot territories for land savings: A process guide.](#)

Municipalities will be inspired to control sprawl, rehabilitate historic centres, and preserve biodiversity by using field-tested approaches. The guide helps communities define their urban strategy and enables them to reinvent a model of densification based on quality of life.

[FNAU - Fédération nationale des agences d'urbanisme, 2021: Vers l'objectif de zéro artificialisation nette - Comment atteindre la sobriété foncière?/ National Federation of Urban Planning Agencies, 2021: To meet the goal of net zero land consumption - How to achieve land savings?](#)

This FNAU dossier is intended to serve as a source of inspiration for the debate and implementation of the net zero land consumption target. A range of experiences and examples from the ground, as well as from Italy's neighbours, are exhibited.

[Ministère de la Transition écologique, 2021: La lutte contre l'artificialisation des sols./ French Ministry of Ecological Transition, 2021: Combating soil artificialization.](#)

The document outlines the reform to achieve zero net land take (ZAN) by 2050 with the first intermediate target to halve the rate of consumption of natural, agricultural and forest areas (ENAF) over the next 10 years.

[Ministère de la Transition écologique, 2021: Guide pratique pour limiter l'artificialisation des sols./ French Ministry of Ecological Transition, 2021: A practical guide for limiting soil artificialization.](#)

For many decades, economic land management has been a goal, although it is sometimes viewed as a limitation rather than an advantage. The target of this guide is to provide feedback on innovative experiences that illustrate best practices in economic land management while maintaining a certain quality of life

[CEREMA, 2022: Sobriété foncière, la clé pour des sols et territoires vivants./ CEREMA, 2022: Land preservation, the key to lively soils and territories.](#)

A 12-page summary of a first approach to land conservation for local elected officials. The guide presents the following essentials: The essentials are presented in the guide: Why consider land sobriety? How should it be done? What tools are available to me?.

[CEREMA, 2022: La densité de logement dans les opérations d'aménagement en extension urbaine. Cadrage méthodologique et données nationales./ CEREMA, 2022: Housing density in urban extensions. Methodological framework and national data.](#)

The study provides a method for objectively calculating development density in order to investigate the impact of density on land use.

[Office Français de la Biodiversité, 2022: Renaturer les sols - Des solutions pour des territoires durables./ French Biodiversity Office, 2022: Renaturation of soil - Solutions for sustainable territories.](#)

This publication aims to provide initial answers to the legal, technical, and financial issues arising from soil restoration activities. It also reaffirms the need to place living soils at the centre of new methods of territorial development.

Regional Guidelines

[l'État en Haute-Loire, 2021: Guide à l'attention des élus de la Haute-Loire. Ensemble, passons à l'action en matière de lutte contre les logements vacants./ Prefecture of Haute-Loire, 2021: A guide for elected representatives in the Haute-Loire. Let's take the fight against vacant housing together.](#)

A guide to the prevent vacancy in the Haute-Loire Department

[Région Hauts-de-France, 2021: Construire des stratégies foncières: Une démarche indispensable pour une gestion économe de l'espace. Guide méthodologique à destination des acteurs de l'aménagement. Region of Hauts-de-France, 2021: Developing land strategies: An essential step for economical land management. Methodological guide for stakeholder](#)

The methodology guide is designed to assist territories in developing economic land management strategies. It includes an examination of land usage in the Hauts-de-France region, as well as feedback on field experiences, possible methods and tools already implemented by territories. The guide should encourage collaboration with government services, urban planning authorities and land planning experts.

[Région Hauts-de-France, 2021: Contribution de Urba 8 à l'élaboration d'un futur. Guide méthodologique sur les stratégies foncières pour une gestion économe de l'espace. /Region of Hauts-de-France, 2021: Urba 8's contribution to the future. A methodological guide for economical land management strategies.](#)

The aim of this guide is to provide key issues to understanding the challenges of land use, as well as examples and operational tools for implementing land strategies for economic land management.

[Safer de l'Île-de-France, 2022: Guide de la sobriété foncière en Île-de-France. /Safer of the l'Île-de-France, 2022: Guide for sustainable land use in Île-de France.](#)

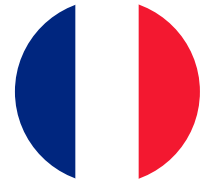
This guide is targeting rural municipalities and provides initial operational guidance for the development of land protection strategies at the municipal and inter-municipal level. It includes a selection of available operational tools, whose implementation is illustrated by inspiring examples from both outside and inside Île-de-France.

[Collectif d'acteurs régionaux, 2023: Feuille de route partenariale. Accompagner les territoires pour concilier développement territorial et sobriété foncière \(2021-2024\)/ Collective regional Players, 2023: Supporting local authorities in reconciling territorial development and land saving \(2021 – 2024\). Partnership roadmap](#)

Since the beginning of 2020, a collective of regional stakeholders has developed a roadmap with the aim to provide regions the best possible support on their way to positive territorial land development and low land consumption at once.

Vacance des logements. Stratégies et méthodes pour en sortir

Vacant housing. Methods and strategies for getting out of it.



Publisher: Direction Urbanisme et territoires et service Habitat de l'Eurométropole de Strasbourg

Publication Date: 2018

Link: <https://www.calameo.com/read/003588254753e389fa6b9>

Summary

Housing vacancy is not unavoidable.

The Housing Vacancy Guide, developed in collaboration with seven communities, includes strategies and methods for reducing housing vacancy. Local decision-makers are provided with methods and procedures for identifying different types of housing vacancy and devising appropriate plans for mobilizing and re-introducing them into the market. Key concerns are addressing territorial divisions, adapting housing solutions for the most disadvantaged, and optimizing housing opportunities for the most vulnerable.

This guide is divided into four chapters:

- Vacancy: What exactly do we mean by vacancy? And why address the issue?
- How can you address housing vacancies in your community?
- Get inspired by concrete cases from other municipalities
- Prepare to implement your approach

With this guide, municipalities have a practical instrument to help local authorities to return a maximum of existing local housing to the market and to create a stock of private housing at affordable rents."

Target Group

- Local level
- Regional level
- Project developer
- Private persons
- Others

Key Topics

- Vacant buildings
- Vacancy management
- Good practice
- Territorial cooperation
- Instruments and measures
- Affordable rents
- Housing opportunities
- Vulnerable groups

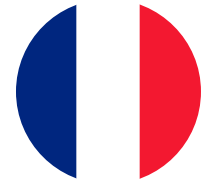
Instruments

Main target of the guideline is ...

The aim of this guide is to mobilize municipalities to act against vacancy. The guide provides methodological bases for the implementation of public territorial policies adapted to local realities.

Territoires pilotes de sobriété foncière: Guide de la démarche.

Pilot territories for land saving: A process guide.



Publisher: Direction nationale de programme Action cœur de ville (ANCT), Direction générale de l'aménagement, du logement et de la nature (DGALN), Plan urbanisme construction architecture (PUCA)

Publication Date: 2021

Link: https://agence-cohesion-territoires.gouv.fr/sites/default/files/2021-08/guide_tpsf_def.pdf

Target Group

- Local level
- Regional level
- Project developer
- Private persons
- Others

Key Topics

- Inner development
- Good practice
- Instruments and measures
- Land recycling
- Land saving
- Land use planning
- Limits of densification
- Zero net land consumption

Summary

After half a century of urban sprawl due to a territorial development model based on automobile mobility, climate, environmental, social and health issues are challenging the way we create regions. The environmental transformation of territories requires the creation of real alternatives to urban expansion to pave a path for a dynamic and land saving territorial development. Land use is a key-issue. Zero net land consumption a goal and a challenge!

To find concrete answers to this challenge, ANCT, DGALN and PUCA are promoting 25 voluntary pilot regions: seven pilot municipalities (Poitiers, Épernay, Dreux, Maubeuge, Louviers, Draguignan and Sète) - and 18 other territories not selected for the experiment but given access to the circle of pioneers of land sobriety, the "place of exchange".

The pilot regions define methods and instruments for land-saving management are defined. The selected pilot regions will receive engineering assistance to discover land and real estate potentials in the existing urban fabric and aid their transformation so that their development concept can be realized. The aim is to test adapted strategies on the ground but also to show the possibilities or limits of intensifying the use and recycling of land in order to create a more attractive livelihood in terms of climate issues and environmental, economic, social and health aspects."

The outcomes are documented in this guide. They are meant to encourage other communities by demonstrating that there are actual solutions and that places may be developed without consuming more land.

Instruments

Main target of the guideline is ...

Municipalities will be inspired to control sprawl, rehabilitate historic centres, and preserve biodiversity by using field-tested approaches. The guide helps communities define their urban strategy and enables them to reinvent a model of densification based on quality of life.

Vers l'objectif de zéro artificialisation nette - Comment atteindre la sobriété foncière?



To meet the goal of net-zero land consumption - How to achieve land savings?



Publisher: FNAU - Fédération nationale des agences d'urbanisme

Publication Date: 2021

Link: <https://www.fnau.org/wp-content/uploads/2021/06/fnau-50-zan-web-bd.pdf>

Summary

The "net-zero land consumption" aim set by current developments is on Europe's, and hence France's, political agenda, and is a challenge for all public and commercial actors involved in territory planning and administration. Implementation requires mobilizing a variety of levers, but also creating the support of all stakeholders to successfully transform development models.

This FNAU publication brings together experiences of urban planning agencies and their partners to contribute to the goal of land saving. Without claiming to be exhaustive, in particular because it does not address all the levers that are crucial (changing the economic models of urban planning, agriculture, taxation, etc.), this FNAU dossier aims to serve as a source of inspiration for the debate by taking into account a wide range of experiences on the ground, as well as those of our neighbours Italy.

Target Group

- Local level
- Regional level
- Project developer
- Private persons
- Others

Key Topics

- Land use planning
- Land saving
- Regional regulations
- Zero net land consumption
- Good practice

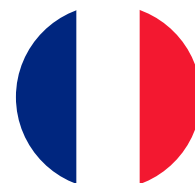
Instruments

Main target of the guideline is ...

This FNAU dossier is intended to serve as a source of inspiration for the debate and implementation of the net zero land consumption target. A range of experiences and examples from the ground, as well as from Italy's neighbours, are exhibited.

La lutte contre l'artificialisation des sols

Combating soil artificialization



La lutte contre l'artificialisation des sols est une réforme prioritaire, portée par le gouvernement. Un engagement a été pris : atteindre le Zéro Artificialisation Nette (ZAN) en 2050, en s'appuyant sur un premier objectif intermédiaire de réduction de moitié du rythme de la consommation des espaces naturels, agricoles et forestiers (ENAF) dans les 10 prochaines années*. Cette trajectoire est à décliner dans les documents de planification et d'urbanisme, et doit être conciliée avec l'objectif de relance de la construction durable, en particulier dans les territoires où l'offre de logements est insuffisante au regard de la demande.

POURQUOI CETTE RÉFORME ?

À l'échelle nationale, entre 20 000 à 30 000 ha d'espaces naturels, agricoles et forestiers sont consommés chaque année en moyenne, principalement à destination de l'habitat.



*Source : DRE de la Seine-Normandie, 2021. Les données sont issues de la base de données nationale de l'artificialisation des sols (ANAF) et de la base de données nationale de l'habitat (BDH).

Publisher: Ministère de la Transition écologique

Publication Date: 2021

Link: https://www.ecologie.gouv.fr/sites/default/files/fiche_lutte_contre_artificialisation_des_sols.pdf

Summary

As sealed soils cannot longer absorb carbon dioxide, the fight against land take is becoming a serious issue to limiting global warming.

The document outlines the reform to achieve zero net land take (ZAN) by 2050 with the first intermediate target to halve the rate of consumption of natural, agricultural and forest areas (ENAF) over the next 10 years. This course must be reflected in planning and urban planning documents as well as balanced with the goal of sustainable development, especially in places where housing supply is limited in relation to demand.

Target Group

- Local level
- Regional level
- Project developer
- Private persons
- Others

Key Topics

- Land use reform
- Land use planning
- Zero net land consumption
- Inner development
- Land saving
- Building density

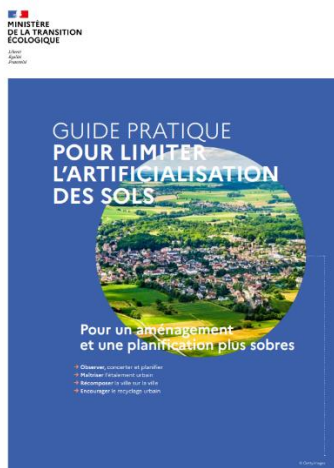
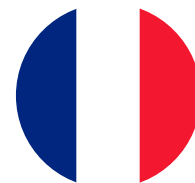
Instruments

Main target of the guideline is ...

...

Guide pratique pour limiter l'artificialisation des sols

A practical guide for limiting soil artificialization



Publisher: Ministère de la Transition écologique

Publication Date: 2021

Link: <https://www.ecologie.gouv.fr/sites/default/files/Guide%20complet.pdf>

Target Group

- Local level
- Regional level
- Project developer
- Private persons
- Others

Key Topics

- Instruments and measures
- Good practice
- Land recycling
- Land management
- Urban sprawl

Summary

Economic land management has been a goal for many decades, although it is sometimes viewed as a constraint rather than a benefit. The target of this guide is to provide feedback on innovative experiences that illustrate best practices in economic land management while preserving a certain level of quality of life. Examples are drawn from both, strategic and operational planning.

This guide consists of educational sheets divided into three main topics:

- Observe, advise, and plan;
- Control urban sprawl and preserve natural and forested areas;
- Redesign the city within the city and promote urban recycling.

This is not a legal work, but a toolkit for elected officials, technicians or professionals, and even citizens interested in these issues.

This guide was published prior to the passage of the Climate Resilience Act and does not incorporate the provisions of that Act. As a result, the guide is presently being updated.

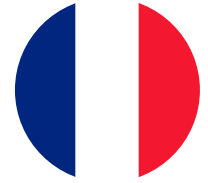
Instruments

Main target of the guideline is ...

For many decades, economic land management has been a goal, although it is sometimes viewed as a limitation rather than an advantage. The target of this guide is to provide feedback on innovative experiences that illustrate best practices in economic land management while maintaining a certain quality of life.

Sobriété foncière, la clé pour des sols et territoires vivants

Land preservation, the key to lively soils and territories



Publisher: CEREMA

Publication Date: 2022

Link: https://www.ensemble77.fr/images/outils/DD/Climat/sobriete_fonciere_2022.pdf

Summary

A brief publication for elected officials with an initial approach to land conservation and the goal of "zero net land consumption," leading to the view of land as a natural resource that must be maintained in the context of climate change, biodiversity, and food sovereignty issues. The guide provides keys and tools to develop a simple and sustainable land strategy.

Content:

- Why should we focus on land conservation? From controlling urban sprawl to protecting land.
- Why do we need to change the development model? Land conservation, an opportunity for vibrant areas
- How can you create a cost-effective and long-term land strategy? Participation throughout the development process.
- The toolkit to implement your land strategy.

Target Group

- Local level
- Regional level
- Project developer
- Private persons
- Others

Key Topics

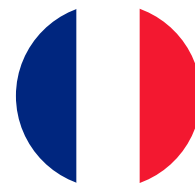
- Land Policy
- Urban sprawl
- Instruments and measures
- Land consumption
- Individual living
- Living density
- Zero net land consumption

Instruments

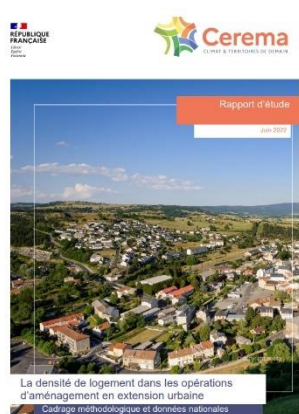
Main target of the guideline is ...

A 12-page summary of a first approach to land conservation for local elected officials. The guide presents the following essentials: Why consider land sobriety? How should it be done? What tools are available to me?

La densité de logement dans les opérations d'aménagement en extension urbaine. Cadrage méthodologique et données nationales



Housing density in urban extensions. Methodological framework and national data.



Publisher: CEREMA

Publication Date: 2022

Link: <https://artificialisation.developpement-durable.gouv.fr/sites/artificialisation/files/fichiers/2022/06/Rapport%20V5.pdf>

Summary

Nationally, developments of less than 8 dwelling units/hectare account for 51% of land consumption (30% for developments of less than 5 dwelling units/hectare), with moderate housing production (19% of total land). As the UNAM (Union Nationale des Aménageurs) often explains, it is these low-density residential areas that have the greatest impact on municipal land use.

This study defines a methodological and theoretical framework for measuring residential building density Throughout urban expansion. It examines the density of residential development on agricultural or natural land between 2009 and 2019. The methodology is intended to assist policymakers and local stakeholders in consideration for development and planning projects.

This report consists of several parts:

- Density framework elements (how to measure density, what indicators to use),
- Elements of territorial comparison (what does a density of 20 dwelling units per hectare mean in terms of urban forms?)
- An analysis methodology that can then be implemented at local level
- A presentation of nationwide results on building density.

Target Group

- Local level
- Regional level
- Project developer
- Private persons
- Others

Key Topics

- Building density
- Urban sprawl
- Territorial comparison

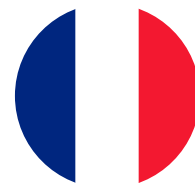
Instruments

Main target of the guideline is ...

The study provides a method for objectively calculating development density in order to investigate the impact of density on land use.

Renaturer les sols - Des solutions pour des territoires durables

Renaturation of soil - Solutions for sustainable territories.



Publisher: Office Français de la Biodiversité

Publication Date: 2022

Link: <https://www.calameo.com/ofbiodiversite/read/003502948d43bd3011bae>

Target Group

- Local level
- Regional level
- Project developer
- Private persons
- Others

Key Topics

- Renaturation
- Land development
- Territorial strategies
- Communication and participation

Summary

Soil restoration measures are increasingly required to address climatic and environmental challenges. They offer benefits to areas in terms of biodiversity recovery, water balance, combating heat islands, or even livelihood. Soil restoration activities bring undeniable benefits to territories. They do, however, create legal, technical, and economical concerns. We hope to provide preliminary answers with this article.

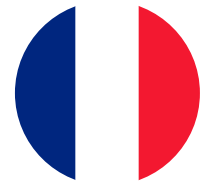
This publication affirms the need to place living soils at the centre of new land development processes and provides technical guidance to accomplish this. This publication also explores the potential use of territorial strategies for soil restoration and eight exemplary actions: implemented by different actors in different ecosystems and with different end uses. We hope they serve as a source of inspiration.

Instruments

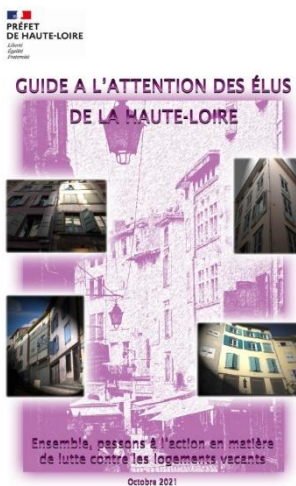
Main target of the guideline is ...

This publication aims to provide initial answers to the legal, technical, and financial issues arising from soil restoration activities. It also reaffirms the need to place living soils at the centre of new methods of territorial development.

Guide a l'attention des élus de la Haute-Loire. Ensemble, passons à l'action en matière de lutte contre les logements vacants



A guide for elected representatives in the Haute-Loire. Let's take the fight against vacant housing together.



Publisher: l'État en Haute-Loire

Publication Date: 2021

Link: https://www.haute-loire.gouv.fr/IMG/pdf/guide-vacance-des-logements-43_v4_mai_2022.pdf

Summary

As of January 2018, there were 17,819 vacant housing units in Haute-Loire (source INSEE), representing 12.4% of main residences compared to 8.5% at regional level. This situation will be exacerbated by the prohibition on subletting existing rented energy class G accommodation as of January 1, 2023 (Decree No. 2021-19 of January 11, 2021).

There is consequently an urgent need for action, especially as the fight against vacancy can also be the answer to various other difficulties, such as satisfying new housing needs, improving housing stock quality, land saving, revitalizing city centres.

To this end, the Haute-Loire Prefecture developed the guide: "Let's take the fight against vacant housing together."

Target Group

- Local level
- Regional level
- Project developer
- Private persons
- Others

Key Topics

- Vacant buildings
- Vacancy management

Instruments

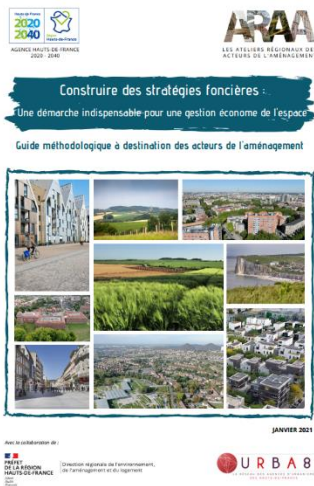
Main target of the guideline is ...

A guide to the prevent vacancy in the Haute-Loire Department.

Construire des stratégies foncières: Une démarche indispensable pour une gestion économe de l'espace. Guide méthodologique à destination des acteurs de l'aménagement.



Developing land strategies: An essential step for economical land management. Methodological guide for stakeholder.



Publisher: Région Hauts-de-France

Publication Date: 2021

Link: <https://www.calameo.com/read/003588254753e389fa6b9>

Summary

Land supports human activities and allows us to eat, work, live, move and to have fun. However, the Food and Agriculture Organization of the United Nations (FAO) reminds us that it is also a limited resource, which means that its loss or degradation cannot be restored within a human lifetime. It is consequently our responsibility to protect this valuable resource.

The Hauts-de-France 2020-2040 agency established the regional working group (ARAA) to promote new spatial planning techniques. The collaboration generated a methodological guide for development actors in 2020.

This guide promotes economic spatial management and encourages regions to adopt land strategies to balance development and conservation of land resources.

This document contains:

- A methodological guide with tool sheets,
- A collection of tools with feedback from regional technicians and partners.

Target Group

- Local level
- Regional level
- Project developer
- Private persons
- Others

Key Topics

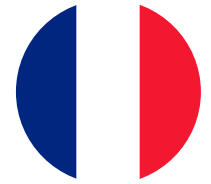
- Spatial planning
- Instruments and measures
- Land strategies

Instruments

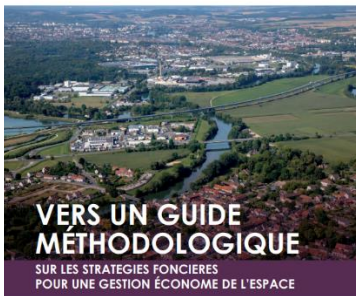
Main target of the guideline is ...

The methodology guide is designed to assist territories in developing economic land management strategies. It includes an examination of land usage in the Hauts-de-France region, as well as feedback on field experiences, possible methods and tools already implemented by territories. The guide should encourage collaboration with government services, urban planning authorities and land planning experts.

Contribution de Urba 8 à l'élaboration d'un futur. Guide méthodologique sur les stratégies foncières pour une gestion économe de l'espace.



Urba 8's contribution to the future. A methodological guide for economical land management strategies



CONTRIBUTION DE URBA 8
À L'ÉLABORATION DU GUIDE

Animation de la démarche

Région Hauts-de-France
Agence Hauts-de-France 2020-2040
Avec le soutien du Réseau Régional des
Acteurs du Développement



Target Group

- Local level
- Regional level
- Project developer
- Private persons
- Others

Key Topics

- Land strategies
- Land consumption
- Instruments and measures
- Good practice

Publisher: Région Hauts-de-France

Publication Date: 2021

Link: <https://www.calameo.com/read/003588254753e389fa6b9>

Summary

The aim of this guide is to provide key issues to understand the challenges of land use, as well as examples and operational tools for implementing land strategies for economic land management.

It is divided into three major sections:

Part 1: Why should we slow down the phenomena of land consumption?

Part 2: Status report on land consumption at the national level and in the Hauts-de-France region.

Part 3: Methodological toolbox.

In order to share perspectives, ideas and knowledge, 80 participants with recognized skills in development, urban planning and design, and especially land management provided experience and knowledge for the guide. Over 50 contributions were written to improve the draft methodological guide. Finally they were analysed and revised by the urban planning offices to harmonize them.

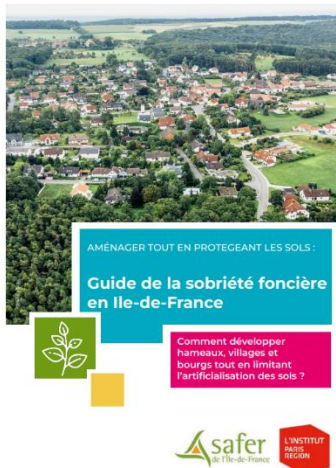
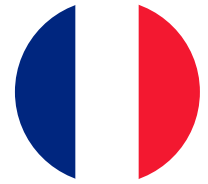
Instruments

Main target of the guideline is ...

The aim of this guide is to provide key issues to understanding the challenges of land use, as well as examples and operational tools for implementing land strategies for economic land management.

Guide de la sobriété foncière en Ile-de-France

Guide for sustainable land use in Ile de France



Publisher: Safer de l'Ile-de-France

Publication Date: 2022

Link: https://www.institutparisregion.fr/fileadmin/NewEtudes/000pack3/Etude_2831/Guide_sobriete_fonciere_final.pdf

Summary

Large areas of agricultural and forestry land have been lost to urbanization in the twentieth century. However, land performs critical bioclimatic functions and contribute to climate change adaptation and mitigation, biodiversity conservation and food production. This excessive land use, which was not correlated with demographic and economic growth, was not adequately regulated for a long time. Given the climatic and environmental emergency, a paradigm shift in regional planning policy is now required and local governments are at the forefront of initiating this transition, which will lead to the gradual implementation of the "zero net land consumption" objective.

This guide is intended to provide initial operational guidance for the development of land protection strategies at municipal and inter-municipal levels. In doing so, Safer of Ile-de-France addresses practical issues such as how can you protect the natural, agricultural and forest areas of your territory while ensuring sustainable development that residents desire? How can we balance quantitative and qualitative construction goals while restricting new land use? What tools and resources are available to support these operations?

The Paris Regions Institute and Safer de l'Île-de-France created this handbook for rural municipalities. It offers a selection of operational instruments available to municipalities and local governments, with inspiring examples from Île-de-France and abroad.

Target Group

- Local level
- Regional level
- Project developer
- Private persons
- Others

Key Topics

- Land consumption
- Zero net land consumption
- Good Practice
- Land strategies
- Nature protection
- Instruments and measures

Instruments

Main target of the guideline is ...

This guide is targeting rural municipalities and provides initial operational guidance for the development of land protection strategies at the municipal and inter-municipal level. It includes a selection of available operational tools, whose implementation is illustrated by inspiring examples from both outside and inside Île-de-France.

Feuille de route partenariale. Accompagner les territoires pour concilier développement territorial et sobriété foncière (2021-2024)



Supporting local authorities in reconciling territorial development and land saving (2021 – 2024). Partnership roadmap.



Publisher: Collectif d'acteurs régionaux de la Région Sud Provence-Alpes Côte d'Azur

Publication Date: 2023

Link: <https://www.calameo.com/read/003588254753e389fa6b9>

Summary

A collective of regional actors aims to eliminate the apparent contradiction between development and land conservation through shared ideas and resources, and to establish a more efficient dynamic in the territories in favour of economic space management. In 2021, their reflections resulted in an action plan for the period 2021-2024. In this roadmap, partners are involved through various commitments presented as a service offer (knowledge development, continuous awareness, technical contributions, planning support, financial levers, provision of methodological tools, etc.) to municipalities. The territories were provided with instruments to save land while continuing to accommodate households and jobs in the area.

This roadmap includes the following themes:

- Building a shared discourse,
- bundling services for communities.
- and creating a more effective partnership dynamic in the areas for the benefit of economic land management.

Target Group

- Local level
- Regional level
- Project developer
- Private persons
- Others

Key Topics

- Land conservation
- Territorial development
- Action plan
- Community service

Instruments

Main target of the guideline is ...

Since the beginning of 2020, a collective of regional stakeholders has developed a roadmap with the aim to provide region and local authorities the best possible support on their way to positive territorial land development and low land consumption at once.

Guidelines for inner development and land conservation Germany

Germany committed use land in a sustainable manner. The German Building Code enshrines the principle of internal over external development and municipalities thereby carry a special responsibility. These land development goals are supported by a set of guidelines for inner development and land conservation. The following register provides an overview of current Federal and Local guidelines for inner development as well as recommendations for action and examples of implementation. More detailed information can be found on the respective factsheets.

National Guidelines

[Bundesinstitut für Bau-, Stadt- und Raumforschung: Strategien der Innenentwicklung, 2020: Strategien der Innenentwicklung. Lebendige und nutzungsgemischte Wohn- und Versorgungsstandorte in kleineren Städten und Gemeinden. Eine Arbeitshilfe. / Federal Institute for Research on Building, Urban Affairs and Spatial Development, 2020: Strategies for town centre development. Vibrant and mixed-use places to live and work in smaller towns and municipalities. A toolkit.](#)

This guide provides useful information on how inner-urban development could become feasible for small and medium sized towns and municipalities. Main target group are smaller towns and municipalities, as well as their planners.

[Umweltbundesamt: 2015: Innenentwicklung organisieren- Kommunale Organisationsstrukturen für ein effizientes Flächenressourcenmanagement im Praxistest / German Environment Agency, 2015: Organising inner development - Municipal organisational structures for efficient land resource management tested in practice](#)

Recommendations how to organise administration and local authorities for a better land management in municipalities

[Deutsches Institut für Urbanistik gGmbH \(Difu\), 2011 : Nachhaltiges Flächenmanagement – Ein Handbuch für die Praxis / German Institute of Urban Affairs, 2011: Sustainable land management - A handbook for practitioners](#)

Recommendations how to organise administration and local authorities for a better land management in municipalities

Regional Guidelines

[Umweltministerium Baden-Württemberg, Bayerisches Staatsministerium für Umwelt und Gesundheit, 2009: Kleine Lücken – Große Wirkung. Baulücken, das unterschätzte Potenzial der Innenentwicklung/ Ministry of Environment Baden-Württemberg, Bavarian Ministry for Environment and Health, 2009: Small gaps – big effects. Gaps between buildings, the underestimated potential of inner development](#)

The document should help to mobilize vacant lots in municipalities by reducing reservations to speak with private property owners. For this purpose, concrete recommendations for the implementation of owner approaches are provided.

[Bayerisches Staatsministerium für Umwelt und Gesundheit, 2010: Kommunales Flächenmanagement/ Bavarian Ministry for Environment and Health, 2010: Municipal land management](#)

The guideline promotes a land-saving municipal management that can be accomplished in small municipalities by merging established planning procedures and existing local potentials and by encouraging the use of all municipal resources.

[Bayerisches Staatsministerium für Umwelt und Gesundheit, Oberste Bayerische Baubehörde, Bayerisches Staatsministerium für Ernährung, Landwirtschaft und Forsten, Bayerisches Staatsministerium für Arbeit und Soziales, Familie und Integration, 2015: Ältere Einfamilienhausgebiete – fit für die Zukunft/ Bavarian Ministry for Environment and Health, Bavarian Ministry for Internal Affairs Building Supervision Authority, Bavarian Ministry of Food, Agriculture and Forestry, Bavarian Ministry for Labour, Social Welfare, Family and integration, 2015: Older single-family housing areas - fit for future.](#)

The guide provides adaptation strategies and recommendations for municipalities on how to valorize older single-family residence areas - characterized by vacant properties, low population density and probable value loss - and thereby reducing the need for new development on the edge of town.

[Bayerisches Landesamt für Umwelt, 2019: Flächensparen – rundum gut!/ Bavarian State Ministry of Environment, 2019: Land-saving management – good all around!](#)

The publication promotes tips for private people, investors and municipalities for planning and building in municipalities. It offers a step-to-step manual to record and activate land systematically. Furthermore, it can be discovered that even seemingly insignificant daily decisions can help preserve land.

[Bayerisches Staatsministerium für Wirtschaft, Landesentwicklung und Energie, 2022: Flächensparoffensive/ Bavarian Ministry for Economy, Spatial Development and Energy, 2022: Land saving offensive.](#)

The documents provides a wealth of real-world examples, funding opportunities, planning tools, and contact information, giving governments and planners valuable suggestions for optimal settlement development.

[Bayerisches Staatsministerium für Wirtschaft, Landesentwicklung und Energie, 2022: Flächensparoffensive. Gewerbeentwicklung der Zukunft flächeneffizient und nachhaltig/ Bavarian Ministry for Economy, Spatial Development and Energy, 2022: Land-saving offensive. Land-efficient and sustainable commercial development.](#)

This guide supports companies, project developers, planners and municipalities in their consideration of sustainable and space-efficient commercial developments by providing planning advice and real-world examples.

Strategien der Innenentwicklung. Lebendige und nutzungsgemischte Wohn- und Versorgungsstandorte in kleineren Städten und Gemeinden. Eine Arbeitshilfe.



Strategies for town centre development. Vibrant and mixed-use places to live and work in smaller towns and municipalities. A toolkit.



Publisher: Bundesinstitut für Bau-, Stadt- und Raumforschung: Strategien der Innenentwicklung
 Publication Date: 2020
Link: <https://www.bbsr.bund.de/BBSR/DE/veroeffentlichungen/sonderveroeffentlichungen/2020/strategien-innenentwicklung.html>

Summary
 The guidelines are based on the findings of the research project „Internal Development for Small Cities and Towns – Strategies for Maintaining Mixed-Used Areas“. This research project explores strategic development methods for strengthening the dynamic qualities of residential, commercial and mixed-use areas in small cities and towns with declining populations. In addition to literary research and expert interviews, the experiences and knowledge from ten nationwide case studies with varying spatial situations and dynamics provided valuable insights into approaches for strategic internal development.
 In this context, working strategically means that there is not simply one, but many direct and indirect ways to achieve interior development goals. Similarly, approaches may be constantly adapted during the development process. In this manual, ten selected development strategies will be introduced and detailed through the use of concrete examples of their successful implementation in the varying case studies. Additionally, key steps of the development processes will be outlined to provide an overview. This combination of structural overview and real-life experience is geared towards stakeholders seeking reference guidelines for their own cities and communities.

- Target Group**
- Local level
 - Regional level
 - Project developer
 - Private persons
 - Others

Key Topics

- Inner development
- Land protection
- Revitalization
- Strategies

Instruments

10 different Strategies are presented.

Main target of the guideline is ...

To demonstrate different strategies for inner-urban development.

Ratgeber Innenentwicklung organisieren - Kommunale Organisationsstrukturen für ein effizientes Flächenressourcenmanagement im Praxistest



Organising inner development - Municipal organisational structures for efficient land resource management tested in practice.



Publisher: Bundesinstitut für Bau-, Stadt- und Raumforschung: Strategien der Innenentwicklung

Publication Date: 2015

Link:

https://www.umweltbundesamt.de/sites/default/files/medien/2271/publikationen/ratgeber_aktuell_13.01.16.pdf

Summary

Land resource management involves a range of legal, technical, planning and municipal issues for which several players in different administrative units and sometimes at several administrative levels are responsible.

Efficient interfaces, stakeholder and communication structures are therefore essential. This guide contains suggestions for local authorities on how to deal more effectively with the cross-sectional task of land resource management through content-related and organisational measures. The aim is to encourage local authorities to bundle planning and authorisation processes by adapting their administrative structures in such a way that they can be geared towards prioritising internal development at an early stage.

Target Group

- Local level
- Regional level
- Project developer
- Private persons
- Others

Key Topics

- Inner development
- Land protection
- Revitalization
- Strategies

Instruments

Principles for the evaluation of organisational structures: Recommendations and test questions for local authorities

Main target of the guideline is ...

To support municipalities in organisational questions for inner-urban development

Nachhaltiges Flächenmanagement – Ein Handbuch für die Praxis



Sustainable land management - A handbook for practitioners.



Publisher: Deutsches Institut für Urbanistik gGmbH (Difu),

Publication Date: 2011

Link:

Summary

A working guide for sustainable land management, a decision-making aid for politicians, a comprehensive compendium for planning practice, a textbook for prospective planners, a collection of scientific articles on sustainability and land use - a bit of everything and yet completely independent. This publication, "Sustainable Land Management - A Handbook for Practitioners", brings together and systematizes the results, knowledge, instruments and approaches developed for sustainable land management as well as the experience gained in testing and implementing the results, which were developed as part of the funding priority "Research for the Reduction of Land Use and Sustainable Land Management" - "REFINA" for short - of the Federal Ministry of Education and Research (BMBF).

Target Group

- Local level
- Regional level
- Project developer
- Private persons
- Others

Key Topics

- Inner development
- Land protection
- Revitalization
- Strategies

Instruments

Principles for the evaluation of organisational structures: Recommendations and test questions for local authorities

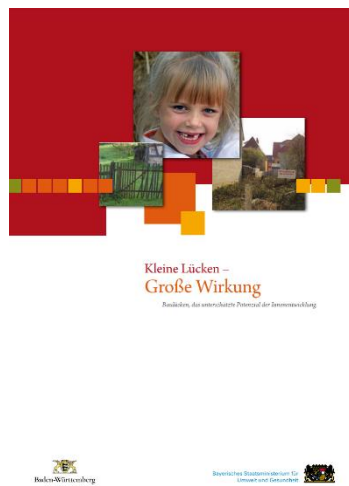
Main target of the guideline is ...

To support municipalities in organisational questions for inner-urban development

Kleine Lücken – Große Wirkung. Baulücken, das unterschätzte Potenzial der Innenentwicklung



Small gaps – big effects. Gaps between buildings, the underestimated potential of inner development



Publisher: Umweltministerium Baden-Württemberg, Bayerisches Staatsministerium für Umwelt und Gesundheit

Publication Date: 2008

Link: http://www.hai-info.net/HAI_Folder_090109.pdf

Summary

The importance of vacant lots for successful inner development is often unknown and regularly underestimated. However, vacant lots in predominantly private ownership hold a lot of potential for inner development and all the advantages that come with it (such as efficient use of infrastructure, mix of outdated residential neighbourhoods, secured offer of services). At the same time, there are considerable reservations in municipal planning practice in addressing private property owners.

The document contains selected results from the research project "New Aids for Active Inner Development" (HAI), which was funded by the German Federal Ministry of Education and Research as part of the funding priority "Research for the Reduction of Land Consumption and Sustainable Land Management" (REFINA). Under the slogan "Addressing owners is worthwhile", benefits, recommendations for action and examples are provided for municipalities to mobilize vacant lots inner settlements.

Target Group

- Local level
- Regional level
- Project developer
- Private persons
- Others

Key Topics

- Inner development
- Vacant lots
- Communication and participation
- Land mobilization

Instruments

Main target of the guideline is ...

The document should help to mobilize vacant lots in municipalities by reducing reservations to speak with private property owners. For this purpose, concrete recommendations for the implementation of owner approaches are provided.

Kommunales Flächenmanagement

Municipal land management



Publisher: Bayerisches Staatsministerium für Umwelt und Gesundheit

Publication Date: 2010

Link: https://www.stmb.bayern.de/assets/stmi/buw/staedtebau/iib6_kommunales-flaechenmanagement.pdf

Summary

Municipal land management should contribute to the objective of using available land as sustainably as possible. It copes urban and local development that is socially, environmentally and economically viable to meet future municipal challenges.

The goal of this guideline is to increase awareness of the benefits that especially small municipalities may provide and to encourage their active administration of municipal land in a sustainable manner. It demonstrates how small towns with limited financial and human resources can grow in a way that conserves land by using existing instruments and capacities. This is important because both, the regional difficulties and the internal development's triumphs are much more apparent at municipal level.

Sustainable land management does not necessarily require new instruments, but merely a rethinking of existing structures. Known and effective tools for urban and local development, such as urban land use planning, urban redevelopment, village renewal, and integrated rural development, support land-saving municipality development through redeveloping, converting, or reidentifying existing structures.

Target Group

- Local level
- Regional level
- Project developer
- Private persons
- Others

Key Topics

- Inner development
- Land mobilization
- Village heritage
- Redensification
- Recycling of land
- Land protection
- Intercommunal cooperation
- Instruments and measures



Instruments

Flächenmanagement-Datenbank: FMD-Database to assess inner-urban potentials, including resealing potentials

Main target of the guideline is ...

The guideline promotes a land-saving municipal management that can be accomplished in small municipalities by merging established planning procedures and existing local potentials and by encouraging the use of all municipal resources.

Ältere Einfamilienhausgebiete – fit für die Zukunft

Older single-family housing areas - fit for future.



Publisher: Bayerisches Staatsministerium für Umwelt und Gesundheit, Oberste Bayerische Baubehörde, Bayerische Staatsministerium für Ernährung, Landwirtschaft und Forsten, Bayerische Staatsministerium für Arbeit und Soziales, Familie und Integration

Publication Date: 2015

Link: https://www.stmb.bayern.de/assets/stmi/buw/staedtebau/broschuere_aeltere_efh-gebiete.pdf

Summary

Single-family residents are the most common type of housing in the country. In Bavaria 66% of residential buildings fit into this category. Older single-family home areas built in the 50s, 60s and 70s are facing major upheavals because of demographic change. The resident population is aging, certain properties are occupied by only one person, and the first vacancies and the associated tendencies toward a decline in value for the entire area may occur. In many cases, the building stock, neighbourhood structure as well as supply and service facilities do no longer meet the needs of their residents. For young families, new developments on the outskirts of settlements are more attractive. The market cannot control renewal on its own, especially in areas where population growth is stagnant or declining.

This guide identifies suitable approaches to solve the above-mentioned challenges, which were tested in a pilot project in 2013 and 2014. The guideline considers five fields of action: "New forms of housing, self-determined living", "Attractive residential area", "Social participation, life in old age" and "Inner development". In this context, the adaptation of older single-family residential areas is guided by the following objectives:

- Improve housing quality for both older and younger populations to prepare for the future,
- Preserve and protect property values,
- Create conditions for an independent self-determined life in old age,
- Strengthening internal development and efficient, cost-efficient infrastructure utilisation.

Target Group

- Local level
- Regional level
- Project developer
- Private persons
- Others

Key Topics

- Single-family housing
- Inner development
- Cross-generation living
- Secure property value
- Good practice

Instruments

Main target of the guideline is ...

The guide provides adaptation strategies and recommendations for municipalities on how to valorize older single-family residence areas - characterized by vacant properties, low population density and probable value loss - and thereby reducing the need for new development on the edge of town.

Flächensparen – rundum gut!

Land-saving management – good all around!



Publisher: Bayerisches Landesamt für Umwelt

Publication Date: 2019

Link: https://www.lfu.bayern.de/buerger/doc/uw_96_flaechensparen.pdf

Summary

The most successful land-saving actions begin at the local level. These are for instance the redensification using vacant lots, redevelopment of vacant structures like homes or farmsteads, or new re-use of commercial space. If new buildings are necessary, they should be space-saving. There is also often underestimated potential in everyday life, because seemingly small decisions can have an enormous impact, especially when it comes to saving space.

The publication contains a step-by-step manual for sustainable municipal land management. The actions are detailed as follows:

1. Make land management a municipal responsibility and connect stakeholders
2. Create acceptance by engaging in project-related public relations activities.
3. Identify potential on site
4. Encourage purchase and sale
5. Define quality criteria for development at the edge of the village

The guide is supplemented by practical examples, legal principles and everyday tips on environmental protection.

Target Group

- Local level
- Regional level
- Project developer
- Private persons
- Others

Key Topics

- Inner development
- Land mobilization
- Village heritage
- Redensification
- Recycling of land
- Instruments and measures
- Communication and participation
- Good practice
- Bavarian land management

Instruments

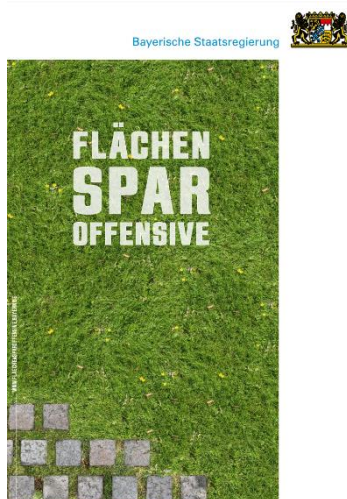
- Step-to-step manual for municipal land-saving management
- Flächenmanagement-Datenbank: FMD-Database to assess inner-urban potentials, including resealing potentials

Main target of the guideline is ...

The publication promotes tips for private people, investors and municipalities for planning and building in municipalities. It offers a step-to-step manual to record and activate land systematically. Furthermore, it can be discovered that even seemingly insignificant daily decisions can help preserve land.

Flächensparoffensive

Land saving offensive



Publisher: Bayerisches Staatsministerium für Wirtschaft, Landesentwicklung und Energie

Publication Date: 2022

Link: https://www.flaechensparoffensive.bayern/fileadmin/user_upload/flaechensparoffensive/downloads/2022-02-23_Flaechensparo_Broschuere-2022-BF.pdf

Summary

An effective reduction in new land use for settlement and transport purposes can only succeed, if all stakeholders involved – including those in politics, business, municipalities, nature conservation and science - collaborate on this effort. The promotion of wealth, economic growth, and fair living and working conditions across the state should not be mutually exclusive but rather mutually complimentary goals of efficient and effective land use.

With these goals in mind, the land-saving offensive was launched as an initiative of the Bavarian state government in 2019. The offensive's objective is a dialog with the stakeholders for further development of existing instruments for land and to implement new strategies and measures. The document of the Land Saving Offensive provides up-to-date information on land consumption in Bavaria. The many tools and measures, together with how they were put into action to save land in Bavaria, are discussed. The land management database, the follow-up cost estimator, and the vitality check are a few examples of the described devices. The descriptions are accompanied by practical examples and links to further information.

Target Group

- Local level
- Regional level
- Project developer
- Private persons
- Others

Key Topics

- Inner development
- Land protection
- Land use statistics
- Instruments and measures
- Good practice

Instruments

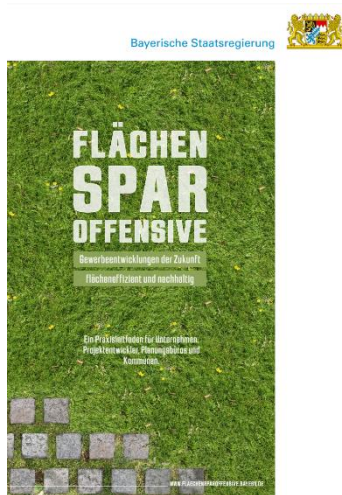
- Flächenmanagement-Datenbank: FMD-Database to assess inner-urban potentials, including resealing potentials
- Folgekostenschätzer: Cost-estimation tool for follow-up costs of urban development
- Vitalitätscheck: Vitality-Check for inner-urban development and vibrant villages

Main target of the guideline is ...

The documents provide a wealth of real-world examples, funding opportunities, planning tools, and contact information, giving governments and planners valuable suggestions for optimal settlement development.

Flächensparoffensive. Gewerbeentwicklung der Zukunft flächeneffizient und nachhaltig

Land-saving offensive. Land-efficient and sustainable commercial development.



Publisher: Bayerisches Staatsministerium für Wirtschaft, Landesentwicklung und Energie

Publication Date: 2022

Link: https://www.stmwi.bayern.de/fileadmin/user_upload/stmwi/publikationen/pdf/2022-07-

[07_Flaechensparoffensive_Planungsleitfaden.pdf](https://www.stmwi.bayern.de/fileadmin/user_upload/stmwi/publikationen/pdf/2022-07-07_Flaechensparoffensive_Planungsleitfaden.pdf)

Target Group

- Local level
- Regional level
- Project developer
- Private persons
- Others

Key Topics

- Commercial area development
- Inner development
- Land protection
- Revitalization
- Good practice

Summary

With highly competitive businesses, a high degree of innovative strength, a consistent site policy, and a high standard of living, Bavaria is a vibrant, developing commercial destination. It is crucial to allow businesses to grow or relocate while making effective use of already-existing public land to preserve these features for the future and simultaneously maintain the economically, ecologically, and socially sustainable development of the state.

Industrial parks clearly shape their surroundings as well as restrict the usability of neighbouring properties. Along with the possibility of conflicts with residential uses, the recreational and leisure value as well as biodiversity of the sites are affected. A quarter of the increased land use in Bavaria during the previous five years has been on commercial properties.

This guide highlights economic, ecological, and social benefits of saving land in commercial zones. Companies, project developers, planners and municipalities receive support with planning tips and practical examples for a sustainable and land-efficient commercial development.

Instruments

Main target of the guideline is ...

This guide supports companies, project developers, planners and municipalities in their consideration of sustainable and space-efficient commercial developments by providing planning advice and real-world examples.

Guidelines for inner development and land conservation Italy

Soil-saving goals in Italy are not defined by law at the national level. At the regional level, only a few regions approved dedicated soil-saving regulations (Lombardy, Veneto, Emilia Romagna). Short-term land reduction targets differ, but all regions are striving to achieve net zero land take by 2050. Few guidelines support this target in Italy so far. The following register provides an overview of current Federal and Local guidelines for inner development with recommendations for action and examples of implementation. More detailed information can be found on the respective factsheets.

National Guidelines

[Istituto Superiore per la Protezione e la Ricerca Ambientale \(ISPRA\), 2021: Carta nazionale dei principi sull'uso sostenibile del suolo/ Italian Institute for Environmental Protection and Research \(ISPRA\), 2021: National charter of principles on sustainable land use](#)

The Charter's goal is to outline the fundamental principles for combating and reducing soil quality degradation and loss of natural system functions by recognizing the major human activities that have an impact on them. It is intended to show the way to sustainability, particularly in land management, spatial and urban planning for urban and peri-urban areas, agriculture, forestry and integrated water and soil management.

Regional Guidelines

[Plattform Land, 2018: Leerstandsmanagement. Wie aus weniger mehr wird/ Plattform Land, 2018: Vacancy management. How less become more.](#)

The goal of the project is to further increase the attractiveness of the community while limiting land consumption. The main focus is on recording vacancies, raising awareness and providing initial advice to target groups as well as communication with owners.

[Europäische Akademie Bozen, 2014: Innovative Ortskernentwicklung. Ein Leitfaden für Gemeinden/ European Academy Bozen, 2014: Innovative village center development. A Guide for municipalities](#)

The aim of the publication is to promote intact village centres and to reduce or even prevent new settlement development in the outskirts. In doing so, the study shows how to promote a vital future village centre development on the one hand and how to support citizens in realizing a redevelopment project on the other.

Carta nazionale dei principi sull'uso sostenibile del suolo

National charter of principles on sustainable land use



Publisher: Istituto Superiore per la Protezione e la Ricerca Ambientale (ISPRA)

Publication Date: 2021

Link: https://www.isprambiente.gov.it/files2022/notizie/carta-dei-principi_def_3_2.pdf



Summary

The Charter promotes sustainable land use as a prerequisite for coexistence between human activities and natural systems.

The Charter considers, in terms of objectives, actions, assessments and monitoring, the reports of the European Parliament Resolution on Soil Protection (2021/2548 RSP) and in the European Soil Strategy for 2030 (SWD 2021 323 final).

The Charter aims to establish the basic principles for addressing and reducing soil degradation (unsustainable consumption and use, loss of organic carbon, contamination, erosion, compaction, loss of productivity and ecosystem services, reduction of biodiversity, salinization, etc.) and loss of natural system functions by highlighting the main human activities that affect them. It should show the way of sustainability, especially in the areas of land management, spatial and urban planning for urban and peri-urban areas, agriculture, forestry, and integrated water and land management.

Target Group

- Local level
- Regional level
- Project developer
- Private persons
- Others

Key Topics

- Soil degradation
- Humans effect on land
- Loss of natural system functions

Instruments

Main target of the guideline is ...

The Charter's goal is to outline the fundamental principles for combating and reducing soil quality degradation and loss of natural system functions by recognizing the major human activities that have an impact on them. It is intended to show the way to sustainability, particularly in land management, spatial and urban planning for urban and peri-urban areas, agriculture, forestry and integrated water and soil management.

Leerstandsmanagement. Wie aus weniger mehr wird.

Vacancy management. How less become more.



Publisher: Plattform Land

Publication Date: 2018

Link: https://www.plattformland.org/wp-content/uploads/2018/02/190514_Basisflyer_Leerstandsmanagement_DE_DEF.pdf

Summary

The negative economic, social and environmental impacts caused by irresponsible land use demand a more effective approach to vacancy management.

This ongoing pilot project explores the idea of prioritizing lower land use by redeveloping empty buildings in twelve south Tyrolian municipalities. Activities include the documentation of building vacancies, raising of public awareness, digitalization of data, and consultations regarding future activities with residents and experts. The primary goal of this project is to decrease land consumption throughout all alpine regions. The method can be adapted and transferred to other alpine regions – from the use of tools for collecting information about vacant buildings and space, to the templates for contracting owners or informing the public.

Target Group

- Local level
- Regional level
- Project developer
- Private persons
- Others

Key Topics

- Inner development
- Reduced land use
- Communication and Participation
- Land recycling

Instruments

Main target of the guideline is ...

The goal of the project is to further increase the attractiveness of the community while limiting land consumption. The main focus is on recording vacancies, raising awareness and providing initial advice to target groups as well as communication with owners.

Innovative Ortskernentwicklung. Ein Leitfaden für Gemeinden

Innovative village centre development. A Guide for municipalities.



EURAC
Research

EUROPEAN ACADEMY OF BOZEN
SÜDTIROL
AUTONOME PROVINZ SÜDTIROL
SÜDTIROL



Innovative Ortskernentwicklung
Ein Leitfaden für Gemeinden
Bianchi J., Niedermüller K., Pionberger K.

Publisher: Europäische Akademie Bozen

Publication Date: 2014

Link: https://bia.unibz.it/view/pdfCoverPage?instCode=39UBZ_INST&filePid=13235293370001241&download=true

Summary

In varying extent, municipalities are confronted with the risk of vacant village centres. These developments frequently coincide with fewer incentives of the population to redevelop old building fabrics in the centre. In addition, there is often a lack of redevelopment guidance, a shortage of parking and a lack of green zones in the village centres. These circumstances lead in several municipalities to an increasing designation of new residential building zones in the outskirts.

The publication is intended to promote intact village centres. The publication is organized into six chapters and is the result of a cooperation between the EURAC Institute for Public Management and the Office for Landscape Protection of the Autonomous Province of Bolzano - South Tyrol. In the first chapter, the so-called donut effect is explained. The second chapter discusses the significance of sustainability in regard to revitalization of village centres. Following that, in chapter three, the framework conditions of spatial planning in South Tyrol are outlined. Chapter four enumerates the benefits of living in the village centres and chapter five provides an overview of information and guidance on the subject in South Tyrol. The sixth chapter concludes with a summary.

Target Group

- Local level
- Regional level
- Project developer
- Private persons
- Others

Key Topics

- Inner development
- Regional policy
- Vitalization of village centres
- Donut effect
- Strategic development plan
- Public implementation
- Information and guidance

Instruments

Main target of the guideline is ...

The aim of the publication is to promote intact village centres and to reduce or even prevent new settlement development in the outskirts. In doing so, the study shows how to promote a vital future village centre development on the one hand and how to support citizens in realizing a redevelopment project on the other.

Guidelines for inner-urban development and land conservation - Liechtenstein

According to the law on the protection and safeguarding of agriculturally usable soil, each municipality has to designate at least 30% of its total area as agricultural use zone. Municipalities have designated 46 priority areas for non-residential uses that generally feature good framework conditions for further development. In relation to the total settlement area, the total settlement reserve of unbuilt land in residential, commercial and public use zones is 30%.

National Guidelines

[ETH Zürich im Auftrag des Fürstentum Liechtenstein, Amt für Hochbau und Planung \(AHR\) \(2022\): raum+ Abschlussbericht Liechtenstein / ETH Zurich on behalf of the Principality of Liechtenstein, Office for Building Construction and Spatial Planning \(2022\): raum+ Final Report Liechtenstein](#)

Report on the systematic survey of building zone reserves, presentation of targeted spatial development strategies and measures on mobilisation of undeveloped settlement reserves.

[Regierung des Fürstentum Liechtenstein \(2020\): Raumkonzept Liechtenstein / Government of the Principality of Liechtenstein \(2020\): Spatial concept](#)

A strategic orientation framework for spatial activities towards 2050.

[Landesverwaltung Fürstentum Liechtenstein \(2011\): Objektblatt Siedlung als Bestandteil des Landesrichtplans / National Administration of the Principality of Liechtenstein \(2011\): Object Sheet Settlement as part the state development plan.](#)

Framework conditions and planning principles for settlement development, greening of urban areas and rehabilitation of inner-urban areas.

Regional Guidelines

[Verein Agglomeration Werdenberg-Liechtenstein \(2016\) : Agglomerationsprogramm Siedlung und Verkehr. Synthesebericht 3. Generation / Werdenberg-Liechtenstein Agglomeration Association \(2016\): Agglomeration programme for settlement and transport. Synthesis report 3rd generation](#)

The Werdenberg-Liechtenstein agglomeration programme, enables the coordination of cross-cutting transport, settlement and landscape issues within the Werdenberg-Liechtenstein functional area

[Verein Agglomeration Werdenberg-Liechtenstein \(2021\) : Agglomerationsprogramm 4: öffentlicher Raum / Freiraum / Hitze. Generation / Werdenberg-Liechtenstein Agglomeration Association \(2021\): 4th generation: public space / open space / heat](#)

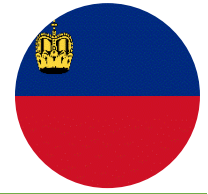
The programme presents climatic analyses regarding heat, ventilation, sun exposure and temperature within settlements and at the fringes of settlements. It presents further the need for action, strategies and measures and gives advice for the implementation in spatial planning.

[Amt für Tiefbau und Geoinformation \(Hrsg.\) \(2023\): Grün! Strassen FL / Civil Engineering and Geoinformation Office \(ed.\) \(2023\): Green! Roads FL](#)

The publication gives advice on how to improve green spaces at roads.

raum+ Abschlussbericht Liechtenstein. Erhebung 2022

raum+ Final Report Liechtenstein. Survey 2022



Abschlussbericht Liechtenstein
Erhebung 2022



ETH zürich



Target Group

- Local level
- Regional level
- Project developer
- Private persons
- Others

Key Topics

- Inner development
- Mobilisation of land reserves
- Quantitative survey of building zone reserves

Publisher: ETH Zurich on behalf of the Principality of Liechtenstein, Office for Building Construction and Spatial Planning (AHR)

Publication Date: 2022

Link: <https://www.liv.li/en/national-administration/office-of-building-construction-and-spatial-planning/spatial-planning/country-planning/space-concept>

Summary

The report presents data of a systematic survey on building zone reserves.

Four different types of data were collected as part of the survey:

- With the "total settlement reserves", a quantitative and qualitative spatial overview of the settlement area reserves in the legally binding building zones in the Principality of Liechtenstein was created.
- Based on this overview, targeted spatial development strategies and measures for the mobilisation of undeveloped settlement area reserves can be developed.
- The identification of "priority areas for internal development" focuses on the development of existing built-up areas. In order to counteract the negative consequences of urban sprawl, internal development in existing areas plays an important role. The identified areas are used to set spatial priorities and recognise possible directions for future internal development.
- In terms of work zone management and monitoring of work zones, an overview of the entire work zone was created with the "Workplaces" and "Work zone areas" data models. This means that both developed and undeveloped properties can be better coordinated and synergies utilised. When looking for a location for businesses a holistic overview of the sites in question is also relevant.

Instruments

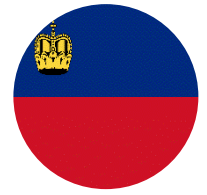
Raum+ Raum+ is a tool developed by ETH Zurich to systematically and uniformly record planning-relevant information on existing building zone reserves in collaboration with all municipalities in Liechtenstein. Based on this, strategies and measures can be developed to mobilise the land reserves and thus promote inward-looking settlement development.

Main target of the guideline is ...

to provide a valid database for internal development

Raumkonzept

Spatial concept



Raumkonzept Liechtenstein 2020



Target Group

- Local level
- Regional level
- Project developer
- Private persons
- Others

Key Topics

- Building plot planning
- Building plot organisation

Publisher: Government of the Principality of Liechtenstein

Publication Date: 2020

Link: <https://www.llv.li/en/national-administration/office-of-building-construction-and-spatial-planning/spatial-planning/country-planning/space-concept>

Summary

The spatial concept is to be understood as a strategic orientation framework for the coordination of spatial activities and promotes co-operation across spatial, specialist and institutional boundaries.

The building zones in Liechtenstein are sufficient for two to three times the number of inhabitants and for a doubling of the number of jobs. Many good arable soils are located in the building zone and in the zone of the rest of the municipality. They are not secure for agriculture in the long term. The diverse cultural landscape has been disappearing for over a century due to human influence. Habitats for specialised plant and animal species are coming under further pressure due to the increasing density of use.

The spatial concept is structured as follows:

- Liechtenstein 2019: Analysis of the spatially relevant conditions and developments to derive the challenges;
- Liechtenstein 2050: Derivation and definition of the objectives for the desired spatial development;
- Spatial types and strategy: Definition of spatial types with similar strategic and the creation of a strategic framework for the management of spatial development;
- Spaces for action and relationship networks: Definition of action areas and international relationship networks with the central approaches to action;
- Outlook: Explanations on the concretisation and implementation of the spatial concept.

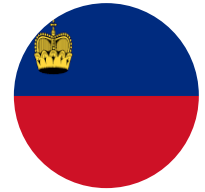
Instruments

Strategies for the different types of settlements

Main target of the guideline is ...

A strategic orientation framework for spatial activities towards 2050

Landesrichtplan - Objektblatt Siedlung: Rahmenbedingungen für die Siedlungsentwicklung, Durchgrünung und Siedlungsgestaltung



The state development plan's Object Sheet Settlement on framework conditions for settlement development, greening of towns and settlement arrangement.

Rahmenbedingungen für die Siedlungsentwicklung	Siedlung
	Landesgebiet
	Nr. 5.1
	Datum: März 2011
Zwecksetzung	
Der Landesrichtplan legt die aus übergeordneten Sicht bei den kommunalen RZN- und Nutzungsplänen zu beachtenden Rahmenbedingungen fest.	
Zuständigkeit	
Die Zuständigkeit der Gemeinden sowie allfällige kommunale Richtlinien wurden revidiert oder sind zuerst in Überarbeitung. Dessen Implementierung in den Landesrichtplan erfolgt laufend, im Rahmen von ordentlichen Anpassungen. Die Hauptziele der rechtskräftigen Baupläne sind, gemessen an dem im Rahmen der Grundzüge der räumlichen Entwicklung formulierten Bevölkerungsziel, an sich ausreichend. Aus dieser Sicht besteht im Allgemeinen kein Bedarf zur Berücksichtigung von zusätzlichen Baureizen. Neuenutzungen sind nur möglich, wenn der Bedarf nach zusätzlichen Baureizen nachgewiesen ist.	
Planungsanlass	
Planungsgegenstand: Die weitere Entwicklung im Bereich Siedlung orientiert sich an folgendem Leitsatz: Ausschöpfen der vorhandenen Baureize. 1. Gemäss den Grundzügen der anstehenden räumlichen Entwicklung sind in erster Priorität die teilweise oder vollständig erschlossenen ungebauten Baureize auszunutzen. 2. Bei Bedarf sind Neuenutzungen in den zur möglichen Siedlungsentwicklung vorgesehenen Gebieten vorzunehmen. Bestehende Infrastrukturen sind bestmöglich auszunutzen. 3. Auf eine vielfältige Nutzungsmischung d.h. auf die Durchmischung einander nicht abdrängender Nutzungen, ist zu achten. 4. Zur besseren Koordination mit der Angebotsplanung des Verkehrs – namentlich des öffentlichen Verkehrs – sind im Rahmen der Ortspolungen Siedlungsgebiete mit intensiver Nutzung d.h. höherer Baudichte und grosserer Nutzungsdurchmischung aufzulösen. 5. Siedlungserhaltungen sind im Umfeld der Bahn-Stationen anzustreben.	
Handlungsanweisungen	
1. Mit planerischen und anderen geeigneten Massnahmen wird eine Konzentration der Siedlungsentwicklung auf das bestehende Baugelände sichergestellt. Die für die Ortspolungen zuständigen Behörden setzen dabei v.a. die Instrumente der Baubehördliche ein. Im Rahmen der finanziellen Möglichkeiten betreiben Land und Gemeinden eine aktive Bodenpolitik. Koordinationsmassnahmen: 2. Für die Einzonung neuer Baugelände ist ein Bedarfsnachweis beizubringen. 3. Ausgenommen sind "Anreizebauten" bestehender, weitgehend überbauter Baugelände, wenn sie raumplanerisch sinnvoll sind. 4. Für Neuenutzungen sind Gebiete zu bevorzugen, welche mit öffentlichen Verkehrsmitteln gut erschlossen oder zu erschliessen sind. Ob die Voraussetzungen dafür gegeben sind, muss im Einzelfall beurteilt werden. Als Kriterien dafür sind die Einwohner- und Arbeitsplatzdichte sowie die Siedlungsstruktur heranzuziehen. Die Siedlungsgemischtheit hat priorität vor der Ausstattung des öffentlichen Verkehrs und Bauverkehrs d.h. im Einzelfall von bestehenden und potentiellen Nutzungen zu erfolgen. Davon abweichende Siedlungsentwicklungen sind nur möglich, wenn der Nachweis erbracht wurde, dass solche Gebiete nicht vorhanden sind. 5. Planungs- und Baubehörden messen im Rahmen ihrer Tätigkeit einer attraktiven Gestaltung der Siedlungen hohen Priorität zu.	

Diese Aussage gilt nicht für Bereiche, die im Vorfeld nicht überbauten Baureizen sind.

Publisher: Office for Structural Engineering and Spatial Planning

Publication Date: 2011

Link: <https://www.llv.li/serviceportal2/amtsstellen/amt-fuer-hochbau-und-raumplanung/pdf-llv-abi-ob-siedlung-2011.pdf>

Summary

The State Development Plan for Liechtenstein includes object sheets that outline planning principles and instructions for authorities. The Object Sheet Settlement provides planning principles and recommendations for municipalities on settlement development. The main principle is that settlement growth should take advantage of existing potentials in building zones. New building areas must provide a proof of demand. If more settlements areas required, priority should be given to locations that are easily accessible or well-served by public transportation.

Municipalities are being tasked to fulfil the above-stated requirements in the course of relevant procedures such as permitting procedures for buildings, spatial plan procedures, use plan procedures and landscape protection procedures under Nature Conservation Law.

The recommendations also include the objective to improve greening of settlement structures in the course of town planning revisions and concepts and implementation of village renewal, delineation of preservation zones (Erhaltungszonen) and renovation of relevant buildings in need of refurbishment.

Target Group

- Local level
- Regional level
- Project developer
- Private persons
- Others

Key Topics

- Inner development
- Building zones
- Existing potentials

Instruments

Main target of the guideline is ...

The identification of framework conditions for the development of settlement areas.

Agglomerationsprogramm Synthesebericht 3. Generation

Agglomeration programme. Synthese 3rd generation



Verain Agglomeration Werdenberg-Liechtenstein
Agglomerationsprogramm Siedlung und Verkehr
Synthesebericht 3. Generation
Buchs, 18. November 2016



von der ETH Zürich
Herzogenbergstrasse 11, CH-8005 Zürich
Tel. 0041 76 54 41 11 | www.ethz.ch | info@ethz.ch

Target Group

- Local level
- Regional level
- Project developer
- Private persons
- Others

Key Topics

- Building plot planning
- Building plot organisation

Publisher: Association Agglomeration Werdenberg-Liechtenstein:
Agglomeration program. Synthesis 3. Generation

Publication Date: 2016

Link: <https://www.llv.li/en/national-administration/office-of-building-construction-and-spatial-planning/spatial-planning/country-planning/space-concept>

Summary

The Werdenberg-Liechtenstein agglomeration programme, enables the coordination of cross-cutting transport, settlement and landscape issues within the Werdenberg-Liechtenstein functional area and was accepted by the Federal Office for Spatial Development ARE in 2014. It is a cross-border agglomeration program of Liechtenstein und St. Gallen.

At the beginning, the initial situation of the region is presented in detail using a wide range of data. This is followed by a description of the trend development based on various scenarios and the challenges for settlement, transport and landscape development are outlined. Chapter 4 presents a picture of the future and identifies sub-strategies for the three topics. This also includes an overview of the necessary measures. The report concludes with a chapter on evaluation and prioritisation.

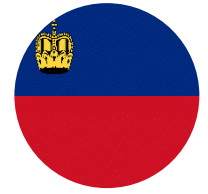
The central element for the implementation of the programme is a proposed FL-A-CH suburban railway between Feldkirch and Buchs. According to the agglomeration programme, such an infrastructure is considered to be an attractive regional public transport backbone along which the agglomeration could concentrate its settlement development. The settlement and landscape sub-strategy provides for corresponding measures, including upgrading of the tripolar regional centre of Buchs-Schaan-Vaduz, with a focus on site development and networking along the railway tracks in addition to upzoning. By aligning the regional bus services with suburban railway services, a quantum leap in journey times and public transport accessibility was expected throughout the region. After the suburban railway proposal has been rejected in a referendum, the Principality of Liechtenstein is focusing on improving its local and regional bus system.

Instruments

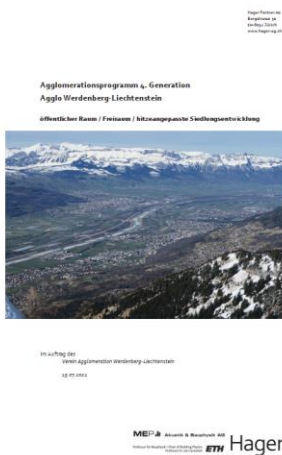
Main target of the guideline is ...

the coordination of cross-cutting transport, settlement and landscape issues within the Werdenberg-Liechtenstein functional area

Agglomerationsprogramm 4. Generation



Agglomeration programme. 4th generation



Publisher: Association Agglomeration Werdenberg-Liechtenstein: 4th generation public space / open space / heat

Publication Date: 2021

Link: https://agglomeration-werdenberg-liechtenstein.ch/fileadmin/user_upload/Dateien/Berichte/Agglo_Werdenberg-Liechtenstein_Bericht_oeffentlicher_Raum_Freiraum_hitzeangepasste_Siedlungsentwicklung_210715.pdf

Summary

Building on the 3rd generation agglomeration programme (AP 3G), the 4th generation agglomeration programme (AP 4G) aims to further develop and optimise the programme. In particular, it offers a conceptual approach to the upgrading of open settlement areas, taking into account settlement climate aspects.

While AP 3G largely focuses on the large landscape areas outside the settlements, AP 4G is intended to address public spaces and open spaces within the settlement and on the edge of the settlement. In the course of the inner densification of settlement areas, the provision of open spaces and the networking of these spaces is becoming increasingly important. For this reason, high-quality public spaces and open spaces within the settlement areas should be safeguarded, further developed and supplemented.

This report should be seen as a supplement to the agglomeration programme and deals exclusively with the topics of public space, open space and urban development adapted to the centre.

The programme presents climatic analyses regarding heat, ventilation, sun exposure and temperature within settlements and at the fringes of settlements. It presents further the need for action, strategies and measures and gives advice for the implementation in spatial planning.

Target Group

- Local level
- Regional level
- Project developer
- Private persons
- Others

Key Topics

- Building plot planning
- Building plot organisation

Instruments

Main target of the guideline is ...

The improvement of open public space.

Grün ! Strassen FL

Green! Roads FL



GRÜN! STRASSEN FL
KONZEPT FÜR NACHHALTIGE GRÜNLÄCHEN ENTLANG VON LANDESSTRASSEN IN
LEICHTENSTEIN



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Bericht 19.04.2023

Publisher: Civil Engineering and Geoinformation Office: Green! Roads FL

Publication Date: 2023

Link: <https://www.llv.li/serviceportal2/amtsstellen/amt-fuer-tiefbau-und-geoinformation/pdf-llv-atg-bericht-konzept-nachhaltige-gruenflaechen-entlang-landesstrassen-19-04-2023-cp.pdf>

Summary

The street greening concept pursues various objectives:

- To demonstrate the potential for creating new green spaces around streets
- To demonstrate the potential for improving existing green spaces in the area of the state roads

It starts with an inventory describing the state-specific characteristics along state roads, the state-wide activities for the maintenance of existing facilities and the changes introduced in the direction of biodiversity in recent years.

The presentation of the special characteristics of the "street space" location is followed by a series of concrete examples that describe in detail both a desirable target state and examples with potential for improvement and negative examples.

Finally, detailed recommendations are formulated and measures described.

Target Group

- Local level
- Regional level
- Project developer
- Private persons
- Others

Key Topics

- Building plot planning
- Building plot organisation

Instruments

Main target of the guideline is ...

To demonstrate the compatibility of increased biodiversity and the buffering of climate impacts in and along the road space of national roads.

Guidelines for inner-urban development and land conservation - Slovenia

Land take reduction targets have been set in Slovenia at the national level with a timeline until 2030 and the long-term goal of reaching zero net growth of built-up land until 2050. Few guidelines support this target in Slovenia so far. The following register provides an overview of current Federal and Local guidelines for inner development with recommendations for action and examples of implementation. More detailed information can be found on the respective factsheets.

National Guidelines

General guidelines are drawn up in advance by the Ministry of Natural Resources and Spatial Planning on the basis of the opinion of the Government Commission for Spatial Development and are part of national spatial planning. Municipalities and planners must take them into account in the procedures for drafting spatial plans.

The General Guidelines for Settlement Development contain important requirements from hierarchically superior laws (SPRS, PRS) in the field of spatial planning.

[Ministrstvo za naravne vire in prostor \(2024\): Strategija prostorskega razvoja 2050 / Ministry of Natural Resources and Spatial Planning \(2024\): Spatial development strategy of Slovenia 2050](#)

The strategy aims to establish a more responsible attitude towards space and aims to find multifunctional spatial solutions. In the field of settlement development, it places an emphasis on internal development and renewal for rural settlements and outlines tools for developing a polycentric and resilient urban system, including priority areas for housing and commercial development and a set of monitoring indicators.

[Ministrstvo za infrastrukturo in prostor \(2013\): Splosne smernice s področja razvoja poselitve / Ministry of Infrastructure and Spatial Planning \(2013\): General guidelines on the development of settlements \(2013\)](#)

These general guidelines outline the legal basis for settlement development in Slovenia, including the law on spatial planning, national spatial planning acts as well as by-laws. Based on this legal foundation, it outlines planning principles such as the network of settlements (polycentric urban system, different centralities of urban centres) and the distribution of functions within the settlements.

[Ministrstvo za naravne vire in prostor \(2023\): Načrtovanje In Organizacija Gradbene Parcele Stavbe / Ministry of Natural Resources and Spatial Planning \(2023\): Urban Design - Criteria for the Planning and Organisation of Building Plots](#)

The handbook deals with the planning and organisation of the building plot (BP). According to building typology, the guidelines define the shares between sealed and unsealed part of land in a building plot.

[Ministrstvo za okolje in prostor \(2023\): Odlok o urejenosti naselij in krajine . / Ministry of Natural Resources and Spatial Planning \(2023\): Decree on the regulation of settlements and landscape](#)

Decree, prepared by a municipality as a voluntary spatial planning act by which a municipality sets up a management of public spaces that can not be regulated in a municipal spatial plan and is dealt with, for example, typology and placement of information stands, management of green areas and trees etc.

[Ministrstvo za naravne vire in prostor \(2023\): Zeleni Sistem V Mestih In Naseljih / Ministry of Natural Resources and Spatial Planning \(2023\): A Green System in Settlements. Driving the development of green spaces](#)

The handbook focuses on defining specific guidelines and more detailed rules for green space planning and management for individual development areas.

Strategija prostorskega razvoja Slovenije

Spatial development strategy of Slovenia 2050



Target Group

- Local level
- Regional level
- Project developer
- Private persons
- Others

Key Topics

- Basic premises
- Vision
- Objectives
- Concept
- Guidelines for strategic spatial development and policy development

Publisher: Ministry of Natural Resources and Spatial Planning

Publication Date: 2024

Link:

https://www.gov.si/assets/ministrstva/MNVP/Dokumenti/Prostorski-razvoj/SPRS/Strategija-prostorskega-razvoja_2050_v-angleskem-jeziku.pdf

Summary

Among the Strategic Spatial Development Guidelines in regard to settlement planning and development, the Strategy assigns a priority to the renewal and internal development to rural settlements. Emphasis is placed on the maintenance and renovation of the existing quality building stock and the densification of the settlement structure, which is adapted functionally and technologically to the needs of the population, taking into account expected demographic changes. This takes into account the preservation of quality settlement nuclei and distinctive silhouettes and the guidelines for the protection of cultural heritage and the environment and the distinctive character of settlements and landscapes.

Priority areas for housing development are planned in the regional spatial plan in areas that have the best access to the public passenger transport system, in the vicinity of transport nodes and interchange points of public passenger transport and, in particular, railway lines, in coordination with the integrated transport strategy, taking into account regional demographic projections. Residential areas are designed taking into account the proximity to a variety of jobs and the provision of services of general and general economic interest.

Priority areas for economic development are identified, preferentially in the context of the internal development of urban settlements, in particular in the context of the restructuring, renewal and densification of degraded areas or areas of existing economic and business zones.

Instruments

Central place system (Level 1-4), Priority areas for housing resp. commercial development, Monitoring indicators including desired trends (e.g. net land take with net-0 by 2050, decrease of per-capita area of building land)

Main target of the guideline is ...

to establish a more responsible attitude towards space and aims to find multifunctional spatial solutions.

Splosne smernice s področja razvoja poselitve

General guidelines on the development of settlements



SPLOŠNE SMERNICE S
PODROČJA RAZVOJA POSELITVE

Številka: 33851-14/2013/1
Datum: 29. januar 2013



Publisher: Ministry of Infrastructure and Spatial Planning

Publication Date: 2013

Link:

https://www.gov.si/assets/ministrstva/MNVP/Dokumenti/Prostorski-red/usmerjanje_poselitve.pdf

Summary

The document presents the legal basis of spatial planning and gives information about the general guidelines for the development of settlements and the distribution of activities in space.

The first chapter presents the general target of a polycentric urban system, consisting of a two-tier structured network of centres of national and regional importance, to which a network is linked by an appropriate division of functions and interconnecting transport links.

It further describes general guidelines for the development of settlements. Internal development of settlements is precedent over expansion into new areas. A primary objective is to ensure better utilization and quality use of vacant and underused land in settlement areas (such as abandoned sites, industrial complexes ...).

There are rules for the regeneration of settlements, such as a renovation concept has to define the purpose, objectives and method of renovation in particular the economic, environmental, social, cultural, urban planning, architectural and landscape aspects.

One chapter is dedicated to the distribution of activities, which shall aim for a mix of functions that are compatible with each other or do not interfere with each other.

Finally guidelines for land zoning are given.

Target Group

- Local level
- Regional level
- Project developer
- Private persons
- Others

Key Topics

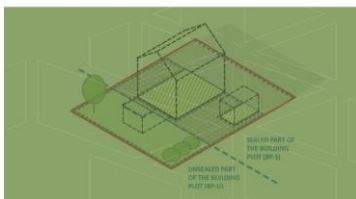
- Settlement system
- General guidelines for settlements
- Rules for land zoning

Instruments

Main target of the guideline is ...

The presentation of general guidelines for settlement development and land zoning in Slovenia.

Urban Design Criteria for the Planning and Organisation of Building Plots



Target Group

- Local level
- Regional level
- Project developer
- Private persons
- Others

Key Topics

- Building plot planning
- Building plot organisation

Publisher: Ministry of Natural Resources and Spatial Planning

Publication Date: 2023

Link: https://www.gov.si/assets/ministrstva/MNVP/Dokumenti/Prostorski-red/DPR_Gradbena_parcela_ang.pdf

Summary

The document is a handbook on rational use building plots.

The handbook deals with the planning and organisation of the building plot (BP). The planning mainly refers to determining the size and shape of the BP, while the organisation refers to dividing the area of the building plot into sub-units and is carried out at two levels – basic and more detailed. The aim of this handbook is to provide guidance and recommendations for the professional definition of BP, which should contribute to spatial arrangements that ensure quality of life in residential buildings, social infrastructure facilities, workplaces, production and commercial areas, etc.

The handbook is divided into four main sections. The first section defines the starting points and explains the basic concepts.

The second section gives the main guidelines for planning and the basic and more detailed organisation of the BP.

The third section defines the general guidelines for BP in terms of integration into the wider context, ensuring a favourable environmental status, hygiene, health and technical aspects, and the regulation of non-standard shapes of BP.

The fourth section is in the form of the so-called 'tables', which give detailed guidelines for the organisation and design of the building plot in accordance with the individual activities in space or building typologies.

Instruments

Main target of the guideline is ...

To support the process of planning, designing and defining building plots.

Odlok o urejenosti naselij in krajine

Decree on the regulation of settlements and landscape



Target Group

- Local level
- Regional level
- Project developer
- Private persons
- Others

Key Topics

- Building plot planning
- Building plot organisation

Publisher: Ministry of Natural Resources and Spatial Planning

Publication Date: 2023

Link: https://www.gov.si/assets/ministrstva/MNVP/Dokumenti/Prostorski-red/odlok_o_urejenosti_naselij_in_krajine.pdf

Summary

The handbook deals with issues of settlement and landscape planning. Its purpose is to present the content and procedures for the preparation of a new instrument for achieving settlement and landscape order, which is prescribed by the Spatial Planning Act.

The content of the manual is divided into several parts. In the second chapter, the sequence of steps in the preparation of the decree on the regulation of settlements and landscape (hereinafter: OUNK) is presented.

The third chapter outlines the broader legislative framework and summarizes the essential requirements arising from it.

The fourth chapter presents a theoretical set of elements, which can be the subject of consideration by the OUNK and defines the aspects of their consideration. The fifth chapter shows the concrete content or the process of preparation of OUNK based on three selected cases. Appendices are also an integral part of the manual. They show support tools for the preparation of OUNK - questionnaires for checking the attitudes of the general public and a set of questions for checking the state of the culture of the built environment according to the evaluation system for measuring the quality of the culture of the built environment - Baukultur.

Instruments

Main target of the guideline is ...

To support stakeholders in active urbanism to improve the image of Slovenian settlements and landscapes.

Zeleni Sistem V Mestih In Naseljih

A Green System in Settlements. Driving the development of green spaces



Publisher: Ministry of Natural Resources and Spatial Planning

Publication Date: 2023

Link: https://www.gov.si/assets/ministrstva/MNVP/Dokumenti/Prostorski-red/DPR_Zeleni_sistem_ANG.pdf

Summary

The handbook focuses on defining specific guidelines and more detailed rules for green space planning and management for individual development areas.

The guideline starts by defining the significance and different aspects of green spaces in settlements – from the ecological, social, morphological to the economic. It provides basic starting points for green space planning and the meaning, objectives and fundamental elements of an urban green system.

Furthermore, it defines types of green spaces according to their function and spatial characteristics, as well as their public accessibility. In the following, it provides guidance for the development of green spaces, specifically general guidelines for the planning, design, management, maintenance and monitoring of green spaces, as well as more detailed rules and guidelines for the planning and management of specific types or areas of green space. These are primarily intended to define spatial implementation conditions and other planning determinants at the implementation level.

Annex I sets out in more detail the starting points and the multi-layered character of planning of green systems and green spaces.

Annex II shows the principles and standards of good practice for management of green spaces.

Annex III proposes graphic symbols for the representation of the elements of the green system in planning documents at the implementation level.

Target Group

- Local level
- Regional level
- Project developer
- Private persons
- Others

Key Topics

- Building plot planning
- Building plot organisation

Instruments

Main target of the guideline is ...

To inform about green space planning and design.

Guidelines for inner development and land conservation Switzerland

Since the revision of the Spatial Planning act in 2020, Switzerland has worked harder than ever to prevent further urban sprawl while lowering settlement pressure on agricultural land and the landscape. As a result, several Swiss guidelines on inner development and land conservation have been devised to assist this purpose. The following register provides an overview of current Federal and Local guidelines for inner development with recommendations for action and examples of implementation. More detailed information can be found on the respective factsheets.

Federal Guidelines

[Bundesamt für Raumentwicklung \(ARE\), 2015: Die Siedlungsentwicklung nach innen umsetzen/ Federal Office for Spatial Development \(ARE\), 2015: Implementing inward settlement development](#)

The purpose of this manual is to assist municipalities in preparing for potential issues inward settlement development. It includes a municipal inward development policy as well as several ways to promote inward settlement growth. For this purpose relevant planning instruments are illuminated.

[Schweizerische Vereinigung VLP-ASPAN, 2016: Organisationsmodelle der Innenentwicklung. Herausforderungen und Lösungsansätze/ Swiss Association VLP-ASPAN, 2016: Organizational models of inner development. Challenges and approaches.](#)

The article deals with the organizational and procedural challenges of the inner development of sites and districts with an existing building stock and provides potential solutions within five organizational models.

[Bundesamt für Raumentwicklung \(ARE\), 2017: Verdichtetes Bauen in Ortszentren fördern, aber wie?/ Federal Office for Spatial Development \(ARE\), 2017: Promoting denser building in village centers, but how?](#)

This report provides findings on dense building in Switzerland, as well as constraints and gaps that impede municipal efforts to promote inner densification. Recommendations are provided for optimizing federal support for inner settlement development.

[Schweizerische Vereinigung VLP-ASPAN, 2018: Innenentwicklung. Zum Beispiel. Sammelband 2016 - 2017/ Swiss Association VLP-ASPAN, 2018: Inner development. For example. Anthology 2016 – 2017.](#)

The publication offers good practical examples of inner development in cities and villages of Switzerland. The examples should inspire and motivate municipalities and reduce fears.

[Bundesamt für Raumentwicklung \(ARE\), 2018 : Modellvorhaben nachhaltige Raumentwicklung 2014 – 2018. Siedlungsentwicklung nach innen umsetzen/ Federal Office for Spatial Development \(ARE\), 2018: Modell project for sustainable spatial development 2014 - 2018. Implementing inner settlement development.](#)

The aim of this report is to document the most important experiences and success factors from seven model projects to embed them in the general context of inward settlement development.

[Schweizerische Vereinigung VLP-ASPAN, 2018: Ortsbildschutz und Verdichtung. Raumplanerische Interessenabwägung in Gemeinden mit einem Ortsbild von nationaler Bedeutung \(ISOS\)/ Swiss Association](#)

[VLP-ASPAN, 2018: Sites of national importance and densification. Balancing the interests of spatial planning in municipalities with village site of national importance \(ISOS\).](#)

The work aid offers concrete recommendations for action and processes in the inner development planning with particularly valuable sites. It shows the scope that exists in the assessment of projects within protected or worthy of protection sites and provides ideas on how protection goals can be implemented with instruments of spatial planning.

[Bundesamt für Raumentwicklung \(ARE\), 2019: Regelungen zur Förderung der Verdichtung und zur Beseitigung von Verdichtungshemmnissen/ Federal Office for Spatial Development \(ARE\), 2019: Regulations to promote densification and to remove barriers.](#)

This report provides findings on dense building in Switzerland, as well as constraints and gaps that impede municipal efforts to promote inner densification. Recommendations are provided for optimizing federal support for inner settlement development.

[EspaceSuisse – Verband für Raumplanung, 2022: Innenentwicklung. Zum Beispiel. Sammelband 2018 – 2020 und Sammelband 2021 - 2022/ Inner development. For example. Anthology 2018 – 2020 and 2021 - 2022.](#)

The publication offers good practical examples of inner development in cities and villages of Switzerland. The examples should inspire and motivate municipalities and reduce fears.

[Bundesamt für Raumentwicklung \(ARE\), 2022: ISOS-Leitfaden. Ortsbildschutz und Innenentwicklung/ Federal Office for Spatial Development \(ARE\), 2022: ISOS-Guideline. Protection of settlement character and inner development.](#)

The ISOS Guide provides basic information on how the Federal Inventory of Swiss Sites of National Importance (ISOS) is to be taken into account for inner development. It is designed for municipal and cantonal authorities and is intended to help preserve the value of a site, to develop it in a quality manner and to make proper use of the respective scope for decision-making.

Regional Guidelines

[Raumentwicklung, Wirtschaftsförderung und Geoinformation \(rawi\) Luzern, 2013: Arbeitshilfe Siedlungsentwicklung nach innen / Regional Development, Economy and Geoinformation, 2013: Work aid for inner settlement development](#)

The working aid demonstrates municipalities how to achieve high-quality, sustainable inward settlement development. The emphasis is on the identification of priority development areas. The individual work steps are clearly illustrated by using practical examples from the canton of Luzern.

[Raumentwicklung, Wirtschaftsförderung und Geoinformation \(rawi\) Luzern, 2013: Beispielsammlung. Siedlungsentwicklung nach innen / Regional Development, Economy and Geoinformation, 2013: Practical examples. Inner settlement development.](#)

A compact folder that shows the necessity and opportunities of inner development, as well as specific steps to encourage the process.

[Amt für Gemeinden und Raumordnung \(AGR\) Bern, 2014: Siedlungsentwicklung nach innen: Gute Beispiele aus Berner Gemeinden / Regional office for municipalities and spatial planning Bern, 2014: Inner settlement development: Good examples from municipalities in the canton Bern.](#)

The brochure shows the broad variety of projects for inward settlement development in the canton of Bern with all its challenges and implementation possibilities.

[Verein Agglomeration Schaffhausen, 2015: Arbeitshilfe. Aktivierung von Innenentwicklungspotentialen / Society Agglomeration Schaffhausen, 2015: Work aid. Activation of inner development potentials](#)

The work aid supports municipalities in their efforts to focus settlement development primarily on built-up areas rather than expanding the settlement areas further. The practice-oriented work aid provides examples to demonstrate the success factors for inner development, with the aim that communities can make better use of their own potentials.

[Amt für Raumentwicklung Thurgau, 2015: Siedlungsdichten. Beispiele aus dem Kanton Thurgau/ Department for spatial development, 2015: Settlement densities. Examples from the Canton of Thurgau.](#)

The brochure is intended to give a clear idea of density by providing examples from the canton and to refute possible prejudices against inward settlement development.

[Baudirektion Nidwalden, 2016: Arbeitshilfe Verdichtung / Building Department Nidwalden, 2016: Work aid. Activation of inner development potentials .](#)

This working aid aims to illuminate the objectives and potentials, as well as the opportunities and risks, which can result from the densification of our settlements in terms of building construction and use. It gives municipalities food for thought by demonstrating alternative ideas for the particular implementation of economical land use.

[Amt für Gemeinden und Raumordnung \(AGR\) Bern, 2016: Siedlungsentwicklung nach innen. Arbeitshilfe/ Regional office for municipalities and spatial planning Bern, 2016: Inward settlement development. Work-aid.](#)

The guide shows in 8 work steps how to address the topic of inward development systematically and efficiently - from recording and activating inward development potentials to final controlling. The work aid meant to encourage the municipalities to deal more intensively with the topic of inward settlement development.

[Raumplanungs-, Umwelt und Baudirektion \(RUBD\) Freiburg, 2016: Siedlungsentwicklung nach innen. 32 Beispiele für die Verdichtung in der Schweiz/ Spatial planning, environment and building department, 2016: Inward settlement development. 32 examples for densification in Switzerland.](#)

The guide is intended to highlight the goals, limits but also opportunities of densification. It provides 32 pioneering projects for densification while improving livelihood in Swiss settlement areas.

[Department Bau, Verkehr und Umwelt Aarau, 2017: Hochwertige Siedlungsentwicklung nach innen/ Department for Building, Transportation and Environment Aarau, 2017: High-Quality inward settlement development.](#)

The planning method demonstrates how to establish concrete (interior) development strategies and future-oriented land use plans that are also accepted and supported by municipalities. Facts and basic material

should help with local and regional planning and decision-making. Above all, it is an appeal to municipalities, regions, and the canton to work even more closely together.

[Amt für Raumentwicklung Thurgau, 2017: Arbeitshilfe Innenentwicklung Kanton Thurgau/ Department for spatial development, 2017: Work aid for inner development canton Thurgau.](#)

With this work aid for inner development, the canton of Thurgau wants to sensitize municipalities and cities to the topic and motivate them for quality development. First and foremost, however, the work aid is designed to provide concrete support with a demanding process and advice on the implementation steps.

[Amt für Raumentwicklung Thurgau, 2018: Leitfaden kommunaler Richtplan mit Fokus Innenentwicklung/ Department for spatial development, 2018: Guideline for municipal structure plan with focus on inner development](#)

In respect to the municipal structure plan, the guideline supports the municipality in concretizing the goals and measures of inner development and in implementing the planning mandates with regard to internal development. A checklist therefore guides step by step through the development or revision of a municipal structure plan.

[Amt für Raumplanung Solothurn, 2018: Siedlungsentwicklung nach innen \(SEin\). Leitfaden für Gemeinden/ Department for Spatial Planning Solothurn, 2018: Inward settlement development SEin. Guideline for municipalities](#)

This work aid is designed as a guideline to make it easier for the municipalities of Solothurn to implement the principle of inward settlement development within the framework of the cantonal conditions.

[Amt für Raum und Wald Appenzell Ausserrhoden, 2019: Innenentwicklung im Siedlungsgebiet. Arbeitshilfe für die kommunale Nutzungsplanung/ Department for Space and Forest, 2019: Inner development in settlement areas. Work aid for municipal land use planning](#)

This publication supports municipalities in high-quality inner development of villages. It assists to identify potential areas for inner development, provides measures and approaches for the process and shows solutions that are adapted to the cantonal conditions.

[Baudepartment, Amt für Raumentwicklung und Geoinformation \(AREG\) St. Gallen, 2023: Strategie Siedlungsentwicklung nach Innen/ Building Department. Department for spatial development and Geoinformation, 2023: Inward settlement development strategies](#)

The leaflet on inner settlement development provides an overview of the topic as well information on how to integrate and consider inward development in the local planning process. The focus is on proven steps and the requisite evidence rather than recipes.

Die Siedlungsentwicklung nach innen umsetzen



Implementing inward settlement development



Publisher: Bundesamt für Raumentwicklung (ARE)

Publication Date: 2015

Link: https://www.zh.ch/content/dam/zhweb/bilder-dokumente/themen/planen-bauen/raumplanung/merkblaetter/2015_04_Leitfaden_Siedlungsentwicklung.pdf

Summary

The cantonal spatial planning concept of Zurich specifies that population growth should primarily be absorbed by the urban settlement areas. The high quality of buildings and open spaces must be taken into consideration in order to successfully shape inward settlement expansion and to promote population's acceptance. Thereby existing qualities must be integrated as effectively as feasible. Equally important is the preservation of suitable areas for the manufacturing industry, the protection of local supply and a balanced housing offer. In order to achieve this, inward settlement growth must be carried out collaboratively by involving conviction, commitment and expertise of all parties.

The guideline addresses current development perspectives for a consistent control of inner settlement development as well as for efficient coordination of settlement and transport. In doing so, robust ways for inward development are provided and promising approaches are presented. Proven planning instruments are presented: Location analysis, development concepts, as well as communal land use planning.

Target Group

- Local level
- Regional level
- Project developer
- Private persons
- Others

Key Topics

- Inner development
- Process guiding
- Communication and participation
- Awareness building
- Instruments and measures

Instruments

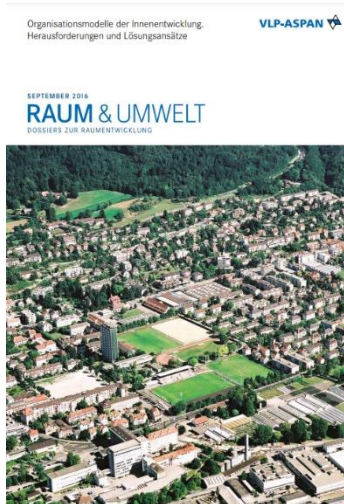
Main target of the guideline is ...

The purpose of this manual is to assist municipalities in preparing for potential issues inward settlement development. It includes a municipal inward development policy as well as several ways to promote inward settlement growth. For this purpose relevant planning instruments are illuminated.

Organisationsmodelle der Innenentwicklung. Herausforderungen und Lösungsansätze



Organizational models of inner development. Challenges and approaches.



Publisher: Schweizerische Vereinigung CLP-ASPAN

Publication Date: 2016

Link: https://www.ebp.ch/sites/default/files/2016-11/201609_Organisationsmodelle%20Innenentwicklung.pdf

Summary

How do we organize the renewal and densification of existing districts and sites? Which requirements must organizational models for inner development fulfil?

A relevant study was created to raise awareness of these difficulties and to suggest potential solutions. This publication describes the findings. Based on today's challenges, five Swiss organizational models are presented and illustrated with examples:

- Municipality in lead
- Organized landowners
- Real estate developers as transformers
- Development community with freedom to act
- Development company

The paper addresses the most essential success elements for adopting these organizational approaches.

Target Group

- Local level
- Regional level
- Project developer
- Private persons
- Others

Key Topics

- Inner development
- Success factors and barriers
- Area type for inner development
- Organization model
- Communication and participants
- Good practice

Instruments

- Organizational models that address challenges of inner development.

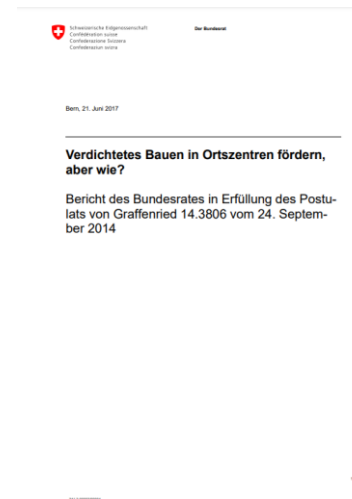
Main target of the guideline is ...

The article deals with the organizational and procedural challenges of the inner development of sites and districts with an existing building stock and provides potential solutions within five organizational models.

Verdichtetes Bauen in Ortszentren fördern, aber wie?



Promoting denser building in village centres, but how?



Publisher: Bundesamt für Raumentwicklung (ARE)

Publication Date: 2017

Link: <https://www.are.admin.ch/dam/are/de/dokumente/recht/publikationen/verdichtetes-bauen-in-ortszentren-foerdern-aber-wie.PDF.download.PDF/verdichtetes-bauen-in-ortszentren-foerdern-aber-wie-de.PDF>

Summary

In recent decades, settlement expansion has mostly occurred outside of existing settlements. The revision of the Spatial Planning Act is intended to channel settlement development inward. Internal densification, in contrary, is difficult to implement. On the one hand, there are obstacles in cantonal or municipal building regulations that need to be eliminated. On the other hand, even in well-developed locations, there are often insufficient incentives to implement densification, despite the possibility of better utilization. As a result, the actual report was assigned.

The report demonstrates how large the actual potential for densification is in Switzerland and how it might be effectively exploited. It explains the main constraints and hurdles to densified building. Existing measures are evaluated and recommendations for adjustments are made. In addition, the application of instruments that prescribe a minimal land use rate is examined. Finally, there are recommendations for networking with real estate circles and the other public players in order to generate incentives to remove densification barriers.

Target Group

- Local level
- Regional level
- Project developer
- Private persons
- Others

Key Topics

- Inner development
- Redensification
- Regional land policy
- Instruments and measures
- Barriers of densification

Instruments

Main target of the guideline is ...

This report provides findings on dense building in Switzerland, as well as constraints and gaps that impede municipal efforts to promote inner densification. Recommendations are provided for optimizing federal support for inner settlement development.

Innenentwicklung. Zum Beispiel. Sammelband 2016 - 2017



Inner development. For example. Anthology 2016 – 2017



Publisher: Schweizer Vereinigung für Landesplanung VLP-ASPAN

Publication Date: 2018

Link: https://www.espacesuisse.ch/sites/default/files/documents/sammelband_zum_beispiel_inforaum_2016_2017_web_0.pdf

Summary

Good examples of inner development are essential. Good examples can show how municipalities have tackled the difficult task of inner development, what obstacles they had to overcome and what are success factors. Almost more interesting than the results are the processes, instruments, cost sharing between the public and private sectors and the roles of the individual actors.

VLP-ASPAN is in the process of building a large collection of good examples of inner development with federal support. This anthology contains eight such examples from different areas across Switzerland. The examples describe and analyse area developments, town centre renewals, public space design, as well as exemplary development planning by cities and municipalities.

The examples are intended to show that densification and quality of life are not mutually exclusive, but rather the opposite! Dense, green neighbourhoods with a broad mix of uses, good public transport connections, shopping and leisure facilities as well as social and cultural institutions attract very different groups of the population.

Thereby the examples have one thing in common: all, the authorities, landowners, and investors, committed work together. Without their openness, perseverance and courage, inner development would not have been possible in many places.

Target Group

- Local level
- Regional level
- Project developer
- Private persons
- Others

Key Topics

- Inner development
- Living quality
- Good practice

Instruments

Main target of the guideline is ...

The publication offers good practical examples of inner development in cities and villages of Switzerland. The examples should inspire and motivate municipalities and reduce fears.

Modellvorhaben nachhaltige Raumentwicklung 2014 – 2018. Siedlungsentwicklung nach innen umsetzen



Modell project for sustainable spatial development 2014 - 2018. Implementing inner settlement development.



Publisher: Bundesamt für Raumentwicklung (ARE)

Publication Date: 2018

Link: https://www.are.admin.ch/dam/are/de/dokumente/agglomerationspolitik/publikationen/siedlungsentwicklung-nach-innen-umsetzen.pdf/download.pdf/movo_siedlungsentwicklung_d_web_110718.pdf

Summary

Inner development necessitates the adoption of a new planning culture. The paradigm shift, however, is not restricted to the new direction of inward settlement development. The complexity of expanding an existing settlement is incomparably greater than planning on greenfield: Additional actors are involved, who are confronted with new tasks for which they are not, or insufficiently prepared. Others, who are directly affected by concrete inner development measures are either involved too late or not involved at all. Additional legal, economic, technical, socio-cultural and organizational challenges must be overcome.

These challenges are subject of the model project "Sustainable Spatial Development 2014-2018" with the focal topic "Implementing settlement development inward". The report deals with seven model regions across Switzerland. It contains ideas and recommendations for political leadership, ideal organizational structure, timely inclusion of relevant stakeholders or for effective process control. The appropriateness of current rules and established procedures is also debated.

This report aims to provide inspiration and guidance for improving and launching inward settlement development projects wisely. The recognition that quality inward development is the common duty of all stakeholders is at the heart of it. Both, professional expertise and local knowledge are needed in order to find acceptable, qualified, local solutions.

Target Group

- Local level
- Regional level
- Project developer
- Private persons
- Others

Key Topics

- Inner development
- Modell project
- Success factors and barriers
- Planning development

Instruments

- Arealplus - For a comprehensive assessment of the economic viability of a site development.

Main target of the guideline is ...

The aim of this report is to document the most important experiences and success factors from seven model projects to embed them in the general context of inward settlement development.

Ortsbildschutz und Verdichtung. Raumplanerische Interessenabwägung in Gemeinden mit einem Ortsbild von nationaler Bedeutung (ISOS)

Sites of national importance and densification. Balancing the interests of spatial planning in municipalities with village site of national importance (ISOS).



Publisher: Schweizerischer Verein für Landesplanung VLP-ASPAN

Publication Date: 2018

Link: <https://www.sz.ch/public/upload/assets/33800/arbeitshilfe-isos-gemeinden-vlp-aspan-2018.pdf>

Summary

Settlement areas in Switzerland have grown rapidly in recent decades. This raises the risk of progressive settlement sprawl. To prevent this, the Spatial Planning Act stipulates that the federal government, cantons and municipalities direct settlement development primarily inward. This means that villages and towns should focus on development in defined building zones and in the existing building stock. The village sites of national importance worthy of protection, which are listed in the “Federal inventory of Swiss village sites of national importance” ISOS, are part of this stock.

Federal government, cantons, cities and municipalities published a joint work aid for the application of the ISOS in villages and towns. The guide was developed to provide support for inner development that enhances the quality of village sites while preserving their character. It summarizes basic information on ISOS and inner development and gives concrete suggestions on how ISOS should be taken into account in planning at municipal level. Case studies and recommendations help to identify and address potential conflicts at an early stage. As a result of collaboration, concerns of all levels of government have been considered in the work aid.

Target Group

- Local level
- Regional level
- Project developer
- Private persons
- Others

Key Topics

- Inner development
- Village heritage
- Protected sites of national importance
- ISOS
- Risk and chances
- Good practice

Instruments

Main target of the guideline is ...

The work aid offers concrete recommendations for action and processes in the inner development planning with particularly valuable sites. It shows the scope that exists in the assessment of projects within protected or worthy of protection sites and provides ideas on how protection goals can be implemented with instruments of spatial planning.

Regelungen zur Förderung der Verdichtung und zur Beseitigung von Verdichtungshemmnissen

Regulations to promote densification and to remove barriers.



Publisher: Amt für Raumentwicklung (ARE)

Publication Date: 2019

Link: https://www.espacesuisse.ch/sites/default/files/documents/Bericht%20Verdichtungshemmnisse_F%C3%B6rderung%20Verdichtung_erg%C3%A4nzt_191031.pdf

Summary

Inner development is challenging. A particularly large number of obstacles are evident when we add or adapt constructions in an existing building stock: the conflicts are bigger and individual interests are more visible than on greenfield sites or large-scale brownfields. The legal framework plays here an important role: For example, building and land use regulations, as well as the provisions on ownership guarantees can significantly impede the mobilization of inner land reserves and thus densification. Informal planning instruments (models, concepts, etc.), in which planning authorities together with the population consider future spatial development at an early stage, are equally significant. Inner development is more than merely increasing building density. Measures are needed to ensure that built-up areas are put to better use.

The report shows how to handle barriers and which regulations promote high-quality densification. Various approaches, such as regulations for mobilization of developed land, the elimination of easements or the flexibilization of development regulations are being investigated. The explanations are related primarily to cantonal law, because the Federal Spatial Planning Act, as fundamental law, merely provides the framework for the instruments and methods regulated by the cantons.

Target Group

- Local level
- Regional level
- Project developer
- Private persons
- Others

Key Topics

- Inner development
- Redensification
- Land mobilization
- Regional land policy
- Instruments and measures
- Barriers of densification
- Village heritage

Instruments

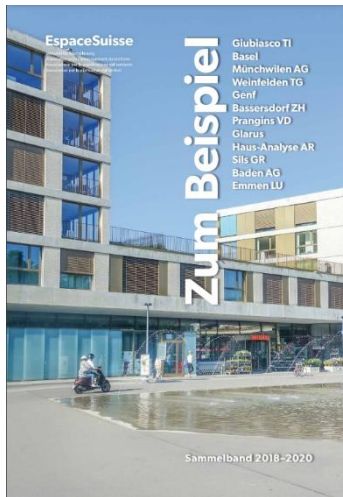
Main target of the guideline is ...

The report shows how to handle barriers of densification and which regulations promote high-quality densification. New approaches will be discussed on how to deal with the high complexity of densification.

Innenentwicklung. Zum Beispiel. Sammelband 2018 – 2020 und Sammelband 2021 - 2022



Inner development. For example. Anthology 2018 – 2020 and 2021 - 2022



Publisher: EspaceSuisse - Verband für Raumplanung

Publication Date: 2022

Link: <https://www.espacesuisse.ch/de/document/sammelband-zb-2018-2020>
https://www.espacesuisse.ch/sites/default/files/documents/Sammelband-Zum-Beispiel-2021-2022_def.pdf

Summary

Good examples of inner development are essential. Good examples can show how municipalities have tackled the difficult task of inner development, what obstacles they had to overcome and what are success factors. Almost more interesting than the results are the processes, instruments, cost sharing between the public and private sectors and the roles of the individual actors.

EspaceSuisse collected numerous good examples of inner development. This anthology contains twelve such examples and is a continuation of an anthology published in 2018. The examples describe, document and analyse area developments, town centre renewals, public space design, as well as exemplary development planning by cities and municipalities. The examples are intended to show that densification and quality of life are not mutually exclusive, but rather the opposite! Dense, green neighbourhoods with a broad mix of uses, good public transport connections, shopping and leisure facilities as well as social and cultural institutions attract very different groups of the population. Thereby the examples have one thing in common: Everyone, the authorities, landowners, and investors committed work together. Without their openness, perseverance and courage, inner development would not have been possible in many places.

Target Group

- Local level
- Regional level
- Project developer
- Private persons
- Others

Key Topics

- Inner development
- Living quality
- Good practice

Instruments

Haus-Analyse - The house analysis is a strategic assessment tool for properties

Main target of the guideline is ...

The publication offers good practical examples of inner development in cities and villages of Switzerland. The examples should inspire and motivate municipalities and reduce fears.

ISOS-Leitfaden. Ortsbildschutz und Innenentwicklung

ISOS-Guideline. Protection of settlement character and inner development.



Publisher: ARE Bundesamt für Raumentwicklung

Publication Date: 2022

Link: <https://www.are.admin.ch/dam/are/de/dokumente/agglomerationspolitik/publikationen/isos-leitfaden.pdf.download.pdf/isos-leitfaden.pdf>

Summary

In recent decades, Switzerland's settlement areas have expanded considerably. This raises the possibility of progressive settlement sprawl. To prevent this, the Spatial Planning Act stipulates that the federal government, cantons and municipalities should primarily direct settlement development inward. This means that villages and towns should primarily continue to develop in zones defined as building areas and within the current building stock. The protected sites of national importance listed in the ISOS federal inventory are part of this potential building areas.

On the initiative of the Conference of Building, Planning, and Environmental Directors (BPUK), the federal government, cantons, and cities and municipalities developed the guideline "*Protection of the site and inner development*" in order to achieve an inner development that improves the quality of the sites while preserving their character. It summarizes basic information on ISOS and inner development and gives concrete suggestions on how ISOS should be considered in planning. It is a work aid with concrete recommendations for planning in areas with particularly valuable sites.

Target Group

- Local level
- Regional level
- Project developer
- Private persons
- Others

Key Topics

- Inner development
- Identity
- Village heritage
- Protected sites of national importance
- ISOS

Instruments

Main target of the guideline is ...

The ISOS Guide provides basic information on how the Federal Inventory of Swiss Sites of National Importance (ISOS) is to be taken into account for inner development. It is designed for municipal and cantonal authorities and is intended to help preserve the value of a site, to develop it in a quality manner and to make proper use of the respective scope for decision-making.

Arbeitshilfe Siedlungsentwicklung nach innen

Work aid for inner settlement development



Publisher: Kanton Luzern – Raumentwicklung, Wirtschaftsförderung und Geoinformation (rawi)

Publication Date: 2013

Link: https://rawi.lu.ch/-/media/RAWI/Dokumente/Downloads/raumentwicklung/arbeitshilfe_siedlungsentwicklung_nach_innen.pdf

Summary

The canton of Luzern has been dealing with the issue of inner settlement development for some time: new regulations in the cantonal structure plan and the newly established municipal settlement model reflect cantonal key impulses to direct settlement expansion more inward. In addition, implementation-oriented tools are required to achieve the cantonal goals for compact and land-saving settlement development. The canton of Luzern wants to provide a work aid to municipalities in order to enable land-saving and quality-based settlement in practice. Four work steps describe how the municipalities can identify and use existing inner development potentials:

- **Analysis:** the combination of the cantonal building zone analysis tool (LUBAT) with a methodology for qualitative assessment prepares an initial basis for the municipalities to evaluate their development opportunities.
- **Strategy:** Based on the analysis, the municipalities are offered a set of strategy approaches ranging from preserve to restructure to redevelop. The strategy approaches represent a modular construction kit that assists municipalities in developing a settlement development strategy.
- **Implementation:** Three important pillars for the implementation are explained: the prioritization of development measures, the design of the implementation process as well as a range of planning-conceptual and political-communicative instruments
- **Controlling:** Monitoring-based data evaluations and the examination of developed settlement areas lead to more effective and qualitative inward settlement growth in long term.

Target Group

- Local level
- Regional level
- Project developer
- Private persons
- Others

Key Topics

- Inner development
- Development potentials
- Instruments and measures
- Development strategies
- Controlling
- Good practice

Instruments

- Cyclical process in four stages, to achieve qualitative, sustainable inward settlement development.
- Checklist for neighbourhood analysis during a local inspection
- Luzerner-Bauzonen-Analysetool (LUBAT) - Lucerne building zone analysis tool calculates free resident capacities

Main target of the guideline is ...

The working aid demonstrates municipalities how to achieve high-quality, sustainable inward settlement development. The emphasis is on the identification of priority development areas. The individual work steps are clearly illustrated by using practical examples from the canton of Luzern.

Beispielsammlung. Siedlungsentwicklung nach innen

Practical examples. Inner settlement development.



Publisher: Kanton Luzern – Raumentwicklung, Wirtschaftsförderung und Geoinformation (rawi)

Publication Date: 2013

Link: https://rawi.lu.ch/-/media/RAWI/Dokumente/Downloads/raumentwicklung/beispiele_siedlungsentwicklung_innen.pdf

Summary

As already postulated in the 2009 Structure plan, the canton of Luzern strives for more efficient use of existing building zones and the prioritization of inner development potentials. In order to realize these objectives, the canton provides the municipalities the work aid "Inner settlement development". It demonstrates the potential for inner development and illustrates how spatial planning can support this process.

The following examples demonstrate how an inner development approach can be successfully implemented. There are 23 projects from the canton of Luzern documented. The entire spectrum of high-quality inward settlement growth is presented, from the preservation of a historic mill in the village center to the addition of an attic level to an apartment building to the total reorientation of an industrial wasteland with significant quantitative potential. The individual examples are compared before and after and illustrated with information texts, figures, maps and photos. The examples were selected based on spatial planning criteria and the quality of the measure taken. Architectural quality was also taken into account, but it was not the primary focus.

Target Group

- Local level
- Regional level
- Project developer
- Private persons
- Others

Key Topics

- Inner development
- Valorisation of buildings
- Good practice

Instruments

Main target of the guideline is ...

A collection of 23 examples from the canton of Luzern illustrates how an inner development strategy is successfully implemented in settlements. They are divided into the following categories: preserve and renew, further develop, restructure, reorient, redevelop. The examples should serve as a source of inspiration and information for municipalities, planners, architects, and other interested parties.

Siedlungsentwicklung nach innen: Gute Beispiele aus Berner Gemeinden



Inner settlement development: Good examples from municipalities in the canton Bern.



Publisher: Kanton Bern – Amt für Gemeinden und Raumordnung (AGR)

Publication Date: 2014

Link: <https://www.felberarchitekten.ch/perch/resources/siedlungsentwicklung.pdf>

Summary

The new Spatial Planning Act specifications provide a paradigm shift in spatial planning that necessitates a rethinking of our planning approach: In the future, building development must be carried out even more toward inner settlement development. The focus is on closing gaps between buildings, converting buildings or abandoned settlements, and upgrading existing residential areas. The challenge here is not simply technical, but also social and political. This also implies that there is no one-size-fits-all recipe for inner development, but rather that it is constantly depending on local circumstances.

The canton of Bern tackled the task of reoriented spatial planning at an early stage. However, when it comes to executing spatial planning regulations, municipalities are primarily responsible.

This brochure provides an implementation aid for municipalities with good examples and recognizes success of projects in the canton of Bern. The projects presented from different municipalities in Bern testify to the range of inward development and explain the planning processes behind it. It identifies challenges in the implementation processes. At the same time, it portrays committed individuals who have made a strong case for inward settlement development.

Target Group

- Local level
- Regional level
- Project developer
- Private persons
- Others

Key Topics

- Inner development
- Good practice
- Valorisation of buildings

Instruments

Main target of the guideline is ...

The brochure shows the broad variety of projects for inward settlement development in the canton of Bern with all its challenges and implementation possibilities.

Arbeitshilfe. Aktivierung von Innenentwicklungspotentialen

Work aid. Activation of inner development potentials



Arbeitshilfe
Aktivierung von Innenentwicklungspotentialen

Siedlungsmaßnahmen
Agglomerationsprogramm 2. Generation



Target Group

- Local level
- Regional level
- Project developer
- Private persons
- Others

Key Topics

- Inner development
- Instruments and measures
- Planning strategies
- Good practice

Publisher: Verein Agglomeration Schaffhausen

Publication Date: 2015

Link: https://www.skw.ch/arbeitshilfe_innenentwicklung.130.pdf

Summary

The needs of everyone in terms of living space are increasing and the population in the canton of Schaffhausen is growing. Instead of extending settlement areas to meet the increasing demand for living space and jobs, future settlement expansion should concentrate on the already densely populated areas. This and measures against urban sprawl are highlighted in the revised Spatial Planning Act, which came into force on May 1, 2014.

Planning and building in a densely populated area is far more complicated than planning on a "green field" and is a significant challenge for everyone involved. The main goal is to ensure a high settlement quality. It is crucial to recognize the special qualities of existing settlement structures and to develop them in a targeted manner. Inner development does not necessarily mean "densification" in the sense of building higher and denser. Rather, it is about making the existing settlement area more diverse and efficient to use. There should be a balanced development of settlement and open spaces in a coordinated manner.

This work aid aims to support the municipalities in the planning processes for inner development. Proven practical examples show how to design inner development and how to identify success and risk factors of projects. It attempts to provide answers to the following questions:

- How can the processes for inner development concretely be approached?
- Which planning instruments can be used for this purpose?
- What is the role of municipalities in the process of inner development?
- What are the most important success factors and project risks related to inner development?

Instruments

Main target of the guideline is ...

The work aid supports municipalities in their efforts to focus settlement development primarily on built-up areas rather than expanding the settlement areas further. The practice-oriented work aid provides

examples to demonstrate the success factors for inner development, with the aim that communities can make better use of their own potentials.

Siedlungsdichten. Beispiele aus dem Kanton Thurgau

Settlement densities. Examples from the Canton of Thurgau



Publisher: Kanton Thurgau – Amt für Raumentwicklung

Publication Date: 2015

Link: <https://raumentwicklung.tg.ch/public/upload/assets/44198/Siedlungsdichten%20-%20Beispiele%20aus%20dem%20Kanton%20Thurgau.pdf>

Summary

Inward settlement development has become the central objective of Swiss spatial planning. The economical use of land is of great importance, especially in the canton of Thurgau with its identity-forming landscape qualities. What is now widely accepted as theory, however, poses a variety of challenges in its concrete implementation.

Compared to the rest of Switzerland, the canton of Thurgau can expect above-average growth in the future. With an expected lively construction activity as a result, the canton of Thurgau is particularly challenged to lead this in the right direction. This means that construction operations should take place in the "right" location, and the resulting developments should be dense enough to meet the need for efficient use of the precious resource of land.

Examples of inner growth from diverse densely populated settlement areas in Thurgau are highlighted in the publication to inspire and motivate municipalities. The goal is to minimize reservations while encourage inner development.

Target Group

- Local level
- Regional level
- Project developer
- Private persons
- Others

Key Topics

- Inner development
- Good practice
- Settlement structure

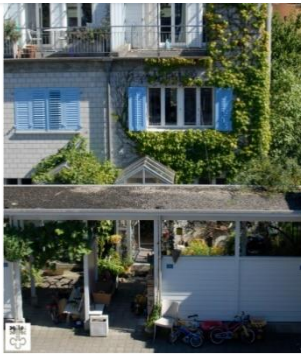
Instruments

Main target of the guideline is ...

The brochure is intended to give a clear idea of density by providing examples from the canton and to refute possible prejudices against inward settlement development.

Arbeitshilfe Verdichtung

Work aid. Activation of inner development potentials.



Baudirektion Nidwalden

Arbeitshilfe Verdichtung

Umsetzung Siedlung+
Stam, Januar 2016

Publisher: Kanton Nidwalden - Baudirektion

Publication Date: 2016

Link: https://www.nw.ch/docn/79991/AH_Verdichtung_Januar_2016.pdf

Summary

Densification affects all of us. The topic of "densification" includes not only structural building aspects but also economic, social, ecological, landscape and agricultural ones. Densification is currently being discussed intensively, stirs up fears and raises hopes. Densification affects diverse aspects and has - in one way or another way - a direct impact on each of us, whether we are tenants, property owners or neighbours.

This work aid attempts to focus on potentials and risks as well as the consequences that can result from the densification of our settlements in terms of construction and use. It is not a guideline, but rather a compilation of thought-provoking ideas that show the municipalities possible solutions for the individual implementation of economical land use. It provides a thematic introduction and contains statements on implementation. Finally, it discusses concrete steps and outlines possible results.

The work aid refers to the framework conditions and the available data basis of Nidwalden, in particular to the data from "Siedlung+" (building zone analysis canton Nidwalden).

Target Group

- Local level
- Regional level
- Project developer
- Private persons
- Others

Key Topics

- Inner development
- Chances and risks
- Instruments and measures
- Development strategies
- Controlling
- Good practice

Instruments

Siedlung+ for building zone analyses in the Canton Nidwalden

Main target of the guideline is ...

This working aid aims to illuminate the objectives and potentials, as well as the opportunities and risks, which can result from the densification of our settlements in terms of building construction and use. It gives municipalities food for thought by demonstrating alternative ideas for the particular implementation of economical land use.

Siedlungsentwicklung nach innen. Arbeitshilfe

Inward settlement development. Work-aid.



Publisher: Kanton Bern - Amt für Gemeinden und Raumordnung

Publication Date: 2016

Link: https://www.raumplanung.dij.be.ch/content/dam/raumplanung_dij/dokumente/de/Arbeitshilfen/arbeitshilfe%20fuer%20die%20ortsplanung%20siedlungsentwicklung-de.pdf

Summary

The problem of inward settlement development (SEin) is not new, but it has taken on new significance in the light of the partially updated Spatial Planning Act. Therefore, SEin pursues multiple spatial planning goals at the same time, such as preventing urban sprawl, improving settlement quality and promoting accessibility.

However, the implementation of SEin poses a major challenge for municipalities, planners and investors: the planning processes require a high degree of commitment from politicians and administrators as well as a high level of technical expertise. In many cases, several landowners are affected, and the population has fears and reservations about SEin. Careful planning with view on the overall development goals of a municipality, the involvement of the population in the planning process at the appropriate level and convincing solutions are prerequisites for successful inward settlement development. The working aid offers here assistance.

The guide provides instructions and assistance for municipalities in identifying, assessing, consolidating and activating the potential for inward development. The guide consists of two main parts:

- Problem definition, objectives and challenges of SEin are highlighted.
- The process is explained in eight steps - from the recording to the activation of the inner development potentials to the controlling.

Target Group

- Local level
- Regional level
- Project developer
- Private persons
- Others

Key Topics

- Inner development
- Chances and risks
- Development potentials
- Strategies
- Instruments and measures
- Controlling

Instruments

- Eight working steps to inner settlement development

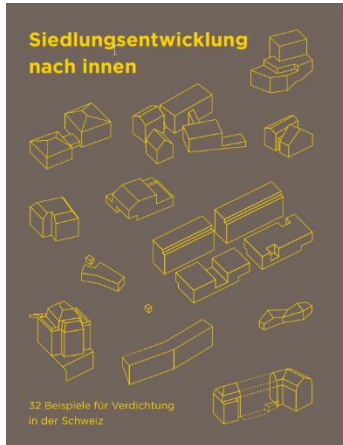
Main target of the guideline is ...

The guide shows in 8 work steps how to address the topic of inward development systematically and efficiently - from recording and activating inward development potentials to final controlling. The work aid meant to encourage the municipalities to deal more intensively with the topic of inward settlement development.

Siedlungsentwicklung nach innen. 32 Beispiele für die Verdichtung in der Schweiz



Inward settlement development. 32 examples for densification in Switzerland.



Publisher: Kanton Freiburg – Raumplanungs-, Umwelt und Baudirektion (RUBD)

Publication Date: 2016

Link: <https://regiosuisse.ch/sites/default/files/2017-06/Siedlungsentwicklung.pdf>

Summary

Densification, inward building, and upgrading are significant concepts in the revised Federal Spatial Planning Act, which went into effect on May 1, 2014. Since that date, a new philosophy of spatial planning has applied. Instead of spreading out further, our villages and towns must develop inwards. The existing settlement structure must be better utilized and densified. The cantons of Neuenburg, Freiburg, and Wallis have created the following guide to support this paradigm change.

The guide consists of two main parts: The first part of the guide covers challenges related to inner settlement development in the categories "Natural Environment", "Built Environment", "Social Environment" and "Processes". The second part of the guide includes 32 examples of inward development projects. They are categorized as "New Buildings," "Redevelopments," and "Mixed Projects," and are accompanied by images, some key data, and a brief description.

The guide is intended to support developers, owners, municipalities, cantons, architects and also housing cooperatives in the implementation of their projects.

Target Group

- Local level
- Regional level
- Project developer
- Private persons
- Others

Key Topics

- Inner development
- Barriers of densification
- Communication and participation
- Valorization of buildings
- New constructions
- Good practice

Instruments

Main target of the guideline is ...

The guide is intended to highlight the goals, limits but also opportunities of densification. It provides 32 pioneering projects for densification while improving livelihood in Swiss settlement areas.

Hochwertige Siedlungsentwicklung nach innen

High-Quality inward settlement development.



Hochwertige Siedlungsentwicklung nach innen | Departement Bau, Verkehr und Umwelt

Inhalt

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1.2 Maßnahmen und Leitungsgründe	8 Ausgleich von Planungszielen
1.3 Prozesse gestalten, den Dialog pflegen	8.1 Können die Ziele bei variablen
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1.5 Instrumentierung für Partizipation	8.3 und Mehrwertigkeiten
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3.3 Entwicklungsziele	7.2 Raumstrukturverteilung
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Stand September 2016

Publisher: Kanton Aarau – Department Bau, Verkehr und Umwelt
Publication Date: 2017
Link: <https://www.ag.ch/media/kanton-aargau/bvu/raumentwicklung/innenentwicklung/planungswegweiser/planungswegweiser.pdf>

Summary

Development will require significant changes to our settlements because the mandate of the new Spatial Planning Act is clear: we must stop settlement sprawl while providing homes for more people. More people in fewer space might produce anxiety and resistance, but it also presents opportunities. Exploiting them requires a rethink in planning at all levels, from cities to small municipalities. High-quality inward settlement development should result in attractive density and proximity, as well as high settlement quality.

In Aargau we want to foster a qualitative inner development. That means inner development is more than just increasing density! We want to use development potential where the infrastructure already exists, and the land is already built on. Conversely, we seek to maintain village and landscape characteristics where they still exist.

The way to high-quality inner development is a collaborative effort that results in an eye-level partnership-based discourse between the canton, regions, and municipalities. Strategic community planning must be prioritized in each community in order to promote the process of inner development and to generate legal certainty. Within the greater framework, locally tailored goals must be defined, local and regional actors must be involved in the process, and acceptance must be gained. This planning guide shows how we can tackle this challenging task together.

Target Group

- Local level
- Regional level
- Project developer
- Private persons
- Others

Key Topics

- Inner development
- Instruments and measures
- Planning models
- Controlling

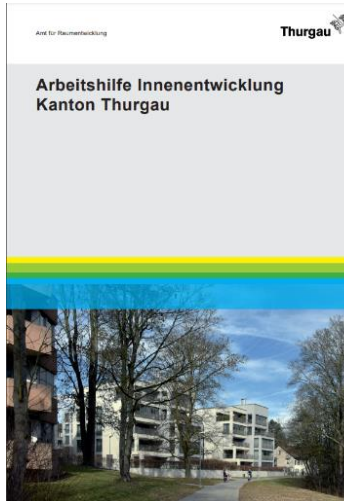
Instruments

Main target of the guideline is ...

The planning method demonstrates how to establish concrete (interior) development strategies and future-oriented land use plans that are also accepted and supported by municipalities. Facts and basic material should help with local and regional planning and decision-making. Above all, it is an appeal to municipalities, regions, and the canton to work even more closely together.

Arbeitshilfe Innenentwicklung Kanton Thurgau

Work aid for inner development canton Thurgau



Publisher: Kanton Thurgau – Amt für Raumentwicklung

Publication Date: 2017

Link: <https://raumentwicklung.tg.ch/public/upload/assets/40459/Arbeitshilfe%20Innenentwicklung%20Kanton%20Thurgau.pdf>

Summary

The revised Federal Spatial Planning Act handles inward settlement development as an important objective of spatial planning. Cities and municipalities have a crucial role in encouraging inward development. However, in the concrete implementation, both municipalities and cities are confronted with diverse challenges and complex planning issues. Internal development opens up many opportunities, which requires an intensive dialog with landowners and the entire population.

This is precisely where the working aid for inner development comes in. It is intended to support the municipalities and cities of the canton Thurgau in the various processes of inner development. The work aid serves as an orientation aid that can be specifically adapted to the communal needs and initial situations. Many municipalities in Thurgau are already dealing intensively with this topic, which is illustrated by some practical examples of implementation.

The working aid is divided into six work steps for inner development. In the sense of an orientation guide, it shows municipalities and cities a common thread through the individual aspects of inner development, from determining the location at the beginning of a planning process to the final controlling. Two aspects in particular are highlighted. First, six different strategic approaches to area development are discussed (determination, analysis, target, strategy, implementation and controlling), along with their implications. Second, the wide range of formal and informal instruments, methods and means for implementing inner development are highlighted along with their contribution to achieving the objectives.

At the analytical level, the guideline proposes a set of nine criteria (residential structure, architectural quality, building typology, building substance, public and private open spaces, infrastructure provision, access to services of general interest, subdivision/ownership structure, further site-specific conditions) and respective guiding questions to assess the suitability of inner-urban development areas. Municipalities as well as cities can adapt their approach, the choice of strategies and the concrete implementation to their specific municipal needs and initial situations.

Target Group

- Local level
- Regional level
- Project developer
- Private persons
- Others

Key Topics

- Inner development
- Communication and participation
- Development potentials
- Instruments and measures
- Planning strategies
- Controlling
- Good practice

Instruments

- Six working steps with guiding questions for inner development. Municipalities can adapt their approach depending on the current state of planning

Main target of the guideline is ...

With this work aid for inner development, the canton of Thurgau wants to sensitize municipalities and cities to the topic and motivate them for quality development. First and foremost, however, the work aid is designed to provide concrete support with a demanding process and advice on the implementation steps.

Leitfaden kommunaler Richtplan mit Fokus Innenentwicklung

Guideline for municipal structure plan with focus on inner development



Publisher: Amt für Raumentwicklung Thurgau (ARE TG)

Publication Date: 2018

Link: <https://raumentwicklung.tg.ch/public/upload/assets/71896/Leitfaden%20kommunaler%20Richtplan%20mit%20Fokus%20Innenentwicklung.pdf>

Summary

The careful use of land is a central task of spatial planning, which should be actively controlled with inward settlement development. The canton of Thurgau has created a guideline that demonstrates to municipalities and cities how inner development can be taken into account at the level of a municipal structure plan. The guideline is based on the working aid for inner development from 2017.

The guide contains an overview for each chapter of the municipal structural plan as well as for each chapter of the other structure plan chapters relevant to inner development (transportation, infrastructure, and landscape). These topic overviews serve as a "checklist" that the municipalities can use to develop or revise their municipal structure plan with regard to inner development. Based on various thematic questions regarding inner development, the municipality can decide which aspects of inner development should be considered. For example, not only the future density and use of the settlement area must be respected, but also the function of green and open space, the situation regarding further development, and the social aspects of an area. In the individual chapters of the guide, the municipalities will find more detailed explanations and information on possible contents, specifications, and measures to support them in the development process.

Selected examples from municipal structure plans serve as case studies. They give hints on how the municipalities can cope with specific situations. Furthermore, it facilitates a constructive exchange and efficient coordination between municipalities and the canton as well as supplements the explanations to the Planning and Building Act (PBG). In this way, the guide helps municipalities to set the course for sustainable and qualitative inner development.

Target Group

- Local level
- Regional level
- Project developer
- Private persons
- Others

Key Topics

- Inner development
- Structure plan
- Good practice

Instruments

Checklist to lead municipalities through the development of a municipal structure plan

Main target of the guideline is ...

In respect to the municipal structure plan, the guideline supports the municipality in concretizing the goals and measures of inner development and in implementing the planning mandates with regard to internal development. A checklist therefore guides step by step through the development or revision of a municipal structure plan.

Siedlungsentwicklung nach innen (SEin). Leitfaden für Gemeinden



Inward settlement development SEin. Guideline for municipalities.



Publisher: Kanton Solothurn – Amt für Raumplanung

Publication Date: 2018

Link: https://so.ch/fileadmin/internet/bjd/bjd-arp/Nutzungsplanung/pdf/LQ_Broschuere_Siedlungsentwicklung.pdf

Summary

Sustainable land use combined with inward settlement development is a central concern of spatial planning in Swiss. Internal densification is based on the notion of increasing the volume of usage while preserving the same footprint of the site or parcel to raise the density of inhabitants/workplaces on the one hand and to cover the growing demand for living space per inhabitant on the other. This is done by additions, conversions, reuse, and replacement construction.

Thereby inner development takes place mainly at the municipal level. It is a complex, challenging task. The guideline "*Inner settlement development SEin*" offer assistance for Solothurn municipalities to implement the principle of settlement development towards the inside. It defines and justifies inward development as well as its opportunities and risks. The guide outlines the cantonal framework for inward development. It explains the use of formal and informal planning instruments to conduct municipal inner development and finally it explains five steps to identify and capitalize on potentials for inner development:

Target Group

- Local level
- Regional level
- Project developer
- Private persons
- Others

Key Topics

- Inner development
- Instruments and measures
- Strategic plan
- Protection of buildings
- Valorisation of buildings
- Controlling
- Local planning
- Communication and participation

- First step: Identify potentials
- Second step: Define goals
- Third step: Develop strategies
- Fourth step: Exploit potential
- Fifth step: Monitoring impact and success

Instruments

5 steps concept to foster inner development in municipalities of Solothurn

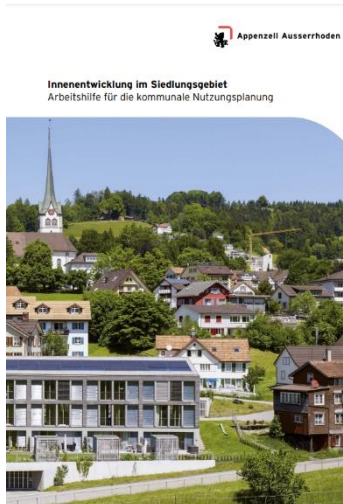
Main target of the guideline is ...

This work aid is designed as a guideline to make it easier for the municipalities of Solothurn to implement the principle of inward settlement development within the framework of the cantonal conditions.

Innenentwicklung im Siedlungsgebiet. Arbeitshilfe für die kommunale Nutzungsplanung



Inner development in settlement areas. Work aid for municipal land use planning.



Publisher: Appenzell Ausserrhoden – Amt für Raum und Wald

Publication Date: 2019

Link: https://ar.ch/fileadmin/user_upload/Departement_Bau_Volkswirtschaft/Amt_fuer_Raum_Wald/Raumentwicklung/Bauen/Innenentwicklung.pdf

Summary

The revised Spatial Planning Act has been in force since May 1, 2014. It sets stricter and more specific requirements for the cantons and municipalities with regard to the economical use of land. Land consumption must be reduced in favour of denser settlement structures. This mandate for internal development applies not only to urban agglomerations, but also to rural areas. For this task, the canton of Appenzell Ausserrhoden offers active support to the municipalities.

This work aid is intended to support the municipalities in tackling the upcoming tasks and legal requirements in settlement development in a targeted manner and to implement them in practice. It provides basic knowledge for guiding the processes and demonstrates how to identify and develop sites and parcels with densification potential in a quality manner. The document explains which criteria demand particular consideration and which arguments might be used to evaluate construction projects. The information is intended to help new building projects to be integrated appropriately and qualitatively into the existing building stock.

Target Group

- Local level
- Regional level
- Project developer
- Private persons
- Others

Key Topics

- Inner development
- Local land use planning
- Development strategies
- Structural criteria and quality
- Living quality

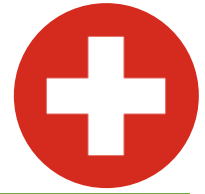
Instruments

Main target of the guideline is ...

This publication supports municipalities in high-quality inner development of villages. It assists to identify potential areas for inner development, provides measures and approaches for the process and shows solutions that are adapted to the cantonal conditions.

Strategie Siedlungsentwicklung nach Innen

Inward settlement development strategies



Publisher: Kanton St. Gallen – Baudepartment, Amt für Raumentwicklung und Geoinformation (AREG)

Publication Date: 2023

Link: https://www.sg.ch/bauen/raumentwicklung/ortsplanung/siedlungsentwicklungnachinnen/_jcr_content/Par/sgch_downloadlist/DownloadListPar/sgch_download.ocFile/Leitfaden_Siedlungsentwicklung_Internet.pdf

Target Group

- Local level
- Regional level
- Project developer
- Private persons
- Others

Key Topics

- Inner development
- Instruments and measures
- Strategic plan
- Protection of buildings
- Valorisation of buildings
- Conversion
- Controlling
- Local planning
- Communication and participation

Summary

With the revised Spatial Planning Act, the Swiss population has placed settlement development on a new footing. Although not new, the issue of inward settlement development has taken a much greater significance. Together with the canton, municipalities must ensure the careful use of land and the modest determination of building zones, as well as the creation of compact settlements that consider a suitable quality of living. Inward development of villages and towns is essential for future viability of the municipalities. It enables:

- qualitative and quantitative growth,
- an upgrade of existing neighbourhoods, town, and village centres as well as brownfields for the benefit of the population,
- the conservation of valuable resources, such as natural and recreational areas as well as agricultural land,
- to save infrastructure costs.

We encourage towns to take an active role in addressing these issues and to make the required resources available. The AREG of the canton of St.Gallen has produced a leaflet on inward settlement development, which provides a brief guide to a complex topic for both political bodies and people generally interested in spatial planning issues, as well as for experts. It provides information on preserving, upgrading, developing and restructuring building areas.

Instruments

Main target of the guideline is ...

The leaflet on inner settlement development provides an overview of the topic as well information on how to integrate and consider inward development in the local planning process. The focus is on proven steps and the requisite evidence rather than recipes.



Towards an Alpine Spatial Development Perspective

Synthesis Report: Compilation of three input papers

On behalf of the Spatial Planning and Sustainable Development Working Group of the Alpine Convention
Mandate 2023-2024



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Summary

This synthesis report takes first steps towards an *Alpine Spatial Development Perspective* (ASDP). The document summarises the state of the art in literature and project reports, and gives an insight into the reflections of the *Spatial Planning and Sustainable Development Working Group of the Alpine Convention* (WG SPSD). The ASDP takes three sectoral perspectives and positions them in relation to spatial development in the Alpine region. The sectoral perspectives include transport & connectivity, green infrastructure and economic development.

Even if the wording of Alpine spatial planning and development sounds rather intuitive, it addresses a complex setting with several dimensions. The pan-Alpine level brings together eight countries, including more federal or centralized systems, EU and non-EU countries, and large and small states. All these countries are organized in a multi-level way, including regional, local and European levels. Further, spatial planning and development must be distinguished. Formal and legally binding planning is mostly assigned to the local and regional level. Spatial development functions in a 'softer' way. Strategic plans, funding programs and governance processes play an important role. Both planning and development have the task of coordinating sectoral policies and dynamics from a spatial perspective, and vice versa, spatial planning and development are strongly influenced by sectoral dynamics.

The chapter on transport and connectivity highlights the main challenges for transport in the Alpine region (environmental issues and accessibility) and gives a brief overview of current policy options. At the EU level, the TEN-T regulations and the Sustainable & Smart Mobility Strategy are most prominent. Pan-Alpine approaches include the Transport Protocol of the Alpine Convention, the EUSALP Declaration on Rail Transport, the Common Transport Strategy for the Alpine Regions of iMONITRAF! as well as the first Report on the State of the Alps on Transport and Mobility. Most of these approaches are of a rather 'soft' instrumental character. At national and regional level, a variety of instruments ensure concrete measures and technical implementation. In addition, a number of strategic documents are also in force at this level. The number of general guidelines, policy documents and concrete measures is high, both in the field of transport and connectivity and in the field of spatial planning and development. At the pan-Alpine level, the linkage between transport and spatial development is rather incremental.

The chapter on green infrastructure and energy highlights key topics and challenges for the Alpine region. Climate change and adaptation, biodiversity, land use and risk mitigation are closely linked to green infrastructure and spatial development. Furthermore, energy challenges are particularly relevant and the current dynamics of energy policies go hand in hand with the question of land competition and environmental issues. The number of related spatial development targets and vision-making documents is high on the pan-Alpine level. Technical planning instruments are not in place, even if several Alpine Convention protocols are topical (e.g. nature protection, soil conservation). In parallel, a number of soft instruments play an important role, mostly in form of project reports (e.g. by OpenSpaceAlps). At national and regional level, a variety of strategic documents formulate targets and strategic pathways. Again, binding planning instruments are to be found on domestic levels.

The discussion on Alpine economy is relatively recent compared to the discourses on transport and environmental issues. This third chapter starts with the economic challenges of the Alpine region, including 'drop height' after rather successful decades in most parts, topogra-

physical challenges for infrastructure, demographic trends, lacking critical mass in globalisation dynamics, and environmental and sustainability issues. The spatial perspective in economic development differs widely across the multi-level system. At the EU level, the Green Deal Industrial Plan and the European Employment Strategy have to be mentioned. At the pan-Alpine level, several documents formulate strategic targets and visions. Pan-Alpine approaches include several declarations of the Alpine Convention (e.g. 'Fostering a sustainable economy in the Alps'). From its early years on, the Alpine Convention has underlined the importance of endogenous economic potential of the Alpine region. The pan-Alpine level is dominated by strategic approaches, while the domestic levels are most relevant in terms of specific target formulations, binding regulatory frameworks and implementation.

In the coming years, the ASDP will position and develop the different elements towards a common (spatial) vision, including thematic, geographical and procedural aspects. In the coming steps, the sectoral perspectives have to be completed, and an integrated reflection has to provide a cross-sectoral vision. The spatial dimension of sustainable development entails the promotion of a cross-sectoral and cross-border approach, which is a crucial element in achieving harmonious sustainable development.

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1 Introduction

1.1 The 'Alpine Spatial Development Perspective'

The aim of this document is to make first steps towards an 'Alpine Spatial Development Perspective'. This objective is part of the mandate of the Spatial Planning and Sustainable Development Working Group of the Alpine Convention. The background is as follows:

- The Alpine region can be seen as the 'contact zone' of a number of nation states and their regions, bringing together a high territorial diversity. This setting comes along with a variety of planning systems and administrative cultures which can challenge consistent policy development.¹
- At the pan-Alpine scale, spatial planning and development is organised in a rather complex way. Three transnational cooperation formats have to be mentioned in this context, namely the Alpine Convention (AC), the EU Strategy for the Alpine Region (EUSALP) and the INTERREG Alpine Space Programme (ASP). All of them have underlined the need for sustainable spatial development on the pan-Alpine scale – in particular the Alpine Convention's Protocol on Spatial Planning and Sustainable Development², the EUSALP Joint paper on Spatial Planning, the Reports on the State of the Alps³ and many ASP projects.⁴

The SPSD WG has initiated a process aiming at a long-term perspective for spatial planning and development. This Alpine Spatial Development Perspective has to be seen as a process rather than just a document. The mandate phase 2023/24 of the Working Group provides important elements, based on three participatory elements and feedback loops, exploring important thematic foci, namely linking the Alpine Spatial Development Perspective with

- a) transport and connectivity,
- b) green infrastructure and energy, and
- c) economic development.

Each participatory event was accompanied by an input paper, presenting important background information and guiding questions. Fig. 1 illustrates this approach.

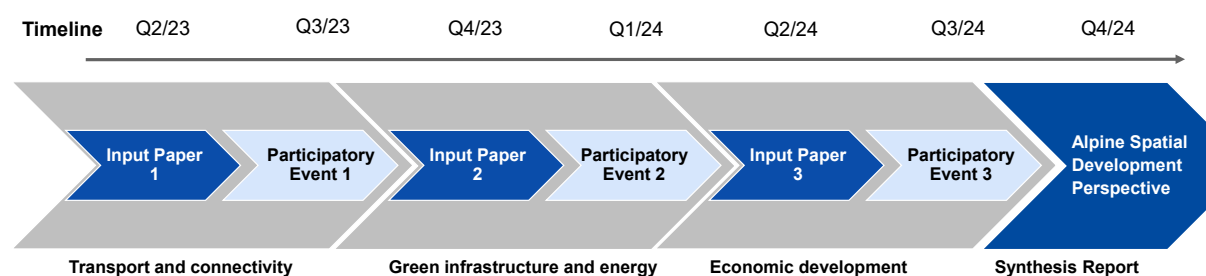


Fig. 1 Elaboration process towards the Alpine Spatial Development Perspective (FAU, 2024)

1 <https://www.espon.eu/Alps2050>

2 <https://www.alpconv.org/en/home/topics/spatial-planning/>

3 <https://www.alpconv.org/en/home/soia/report-on-the-state-of-the-alps/>

4 For projects with a focus on cross-border regional development see this overview: https://www.alpconv.org/fileadmin/user_upload/Organisation/TWB/SPSD/Assessment_study_Cross-border_Cooperation.pdf

This synthesis report brings together the three input papers. The aim is to provide a structured overview that can feed the debate. Chapter 2 addresses transport and connectivity in the Alpine region, Chapter 3 green infrastructure and energy, and chapter 4 economic development in the Alps. This process towards a joint vision helps to facilitate the dialogue between actors with very different mandates for Alpine development and can increase the consistency of concrete measures. The approach is inspired by the long-term vision in the Baltic Sea region. Already in 1992, the involved partners decided to develop visions and perspectives. The VASAB long-term strategy shows that joint efforts can lead to important spatial development objectives.⁵

1.2 Challenges of Alpine spatial planning and development

Even if the wording of Alpine spatial planning and development sounds rather intuitive, it addresses a complex setting with several dimensions. The pan-Alpine level brings together eight nation countries including rather federal or centralist systems, EU and non-EU countries as well as large and small states. All these countries are organised in a multi-level way, involving the regional, municipal and European level.

Moreover, one has to differentiate spatial planning and development. First, planning in a formal and legally binding way is mostly assigned to the local and regional level. Second, spatial development addresses the topic in a less binding, 'softer' way. Funding programs, strategic plans, and governance processes play an important role in this field. Spatial planning – in a formal, juridical and technical sense – is mostly organised via domestic mandates (and with the implications of the Alpine Convention Protocol on Spatial Planning). Spatial development can be found throughout the multi-level system, including the pan-Alpine level.

Both spatial planning and development have the task of coordinating sectoral policies and dynamics from a territorial perspective; and vice versa, spatial development and planning are strongly influenced by sectoral dynamics (as visualised in Fig. 2)⁶. The integrated perspective is an important aspect of the sustainability objective of spatial planning and development: Balancing sectoral demands helps safeguarding future qualities of the Alps as a living space and habitat.

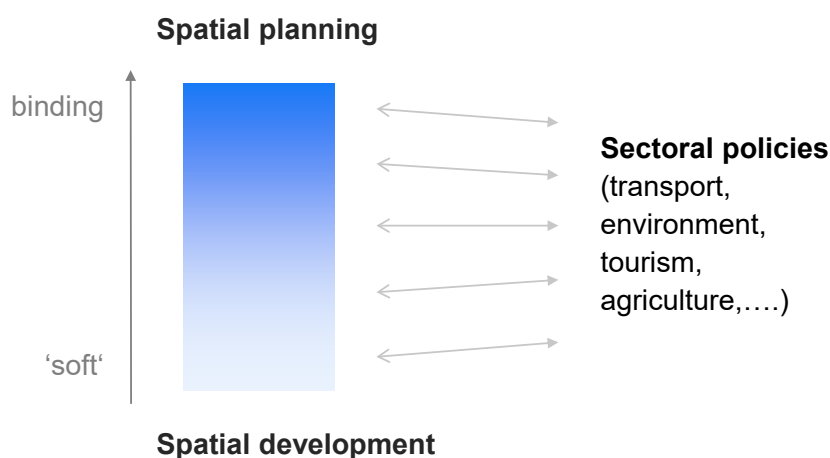


Fig. 2 Spatial planning, spatial development and sectoral policies (FAU, 2024)

5 <https://vasab.org/home/about/long-term-perspective/>; https://www.arl-net.de/system/files/pdf/2024-07/01_meltzian_0.pdf
6 <https://doi.org/10.1659/mrd.2023.00021>

2 Linking spatial development and transport

2.1 Challenges of Alpine transport and connectivity

2.1.1 Overview

Mountain regions exist all across the European continent. Fig. 3 shows the European mountain ranges from a transport perspective.^{7 8} Geographic features vary widely, including long mountain ranges (e.g., Alps, Apennines, Carpathians, Pyrenees, Scandes) and isolated mountain massifs such as those of Central Europe (e.g., the middle mountain ranges of Germany, mountain ranges in Spain, and mountains on many islands).

The Alpine mountains include both sparsely populated rural areas and large urban centers. While some valleys have little transport infrastructure, others are part of the Trans-European Transport Network (TEN-T). In most other European mountain regions, the core networks largely bypass the mountains rather than crossing them.

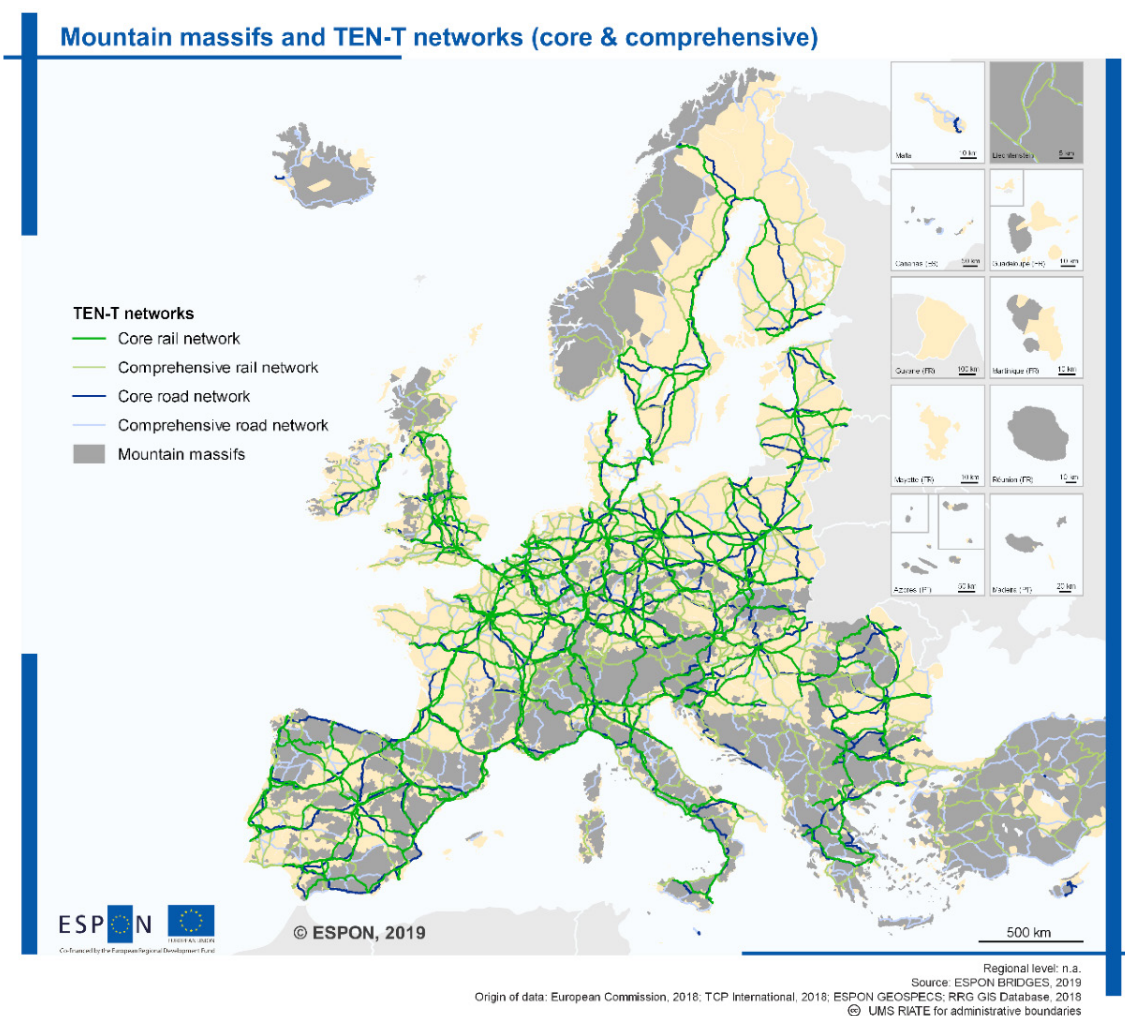


Fig. 3 Mountain massifs and TEN-T networks (ESPON BRIDGES, 2019)

⁷ This report addresses overlapping concepts and wordings:

- 'Transport' focuses in particular on technical infrastructure and capacities, both for passengers and freight
- 'Mobility' focuses on people and their behavior (radius of mobility, modal split etc.)
- 'Accessibility' focuses on the effort needed to reach certain destinations
- The wording of 'connectivity' is used in the coming sections as the concept that aims at a sustainable organization of transport, mobility, and accessibility.

⁸ <https://www.espon.eu/sites/default/files/attachments/BRIDGES%20-%20Final%20Report.pdf>

When reflecting on Alpine connectivity from a territorial perspective, some specificities have to be taken into account. It is in particular true that concrete measures and projects...

- ... tend to be much more expensive, difficult, and sometimes dangerous in mountain regions than in non-mountain regions.
- ... have to accept that the share of suitable sites for connectivity measures is lower than in non-mountain regions.
- ... have to respect a high vulnerability of the mountain context (ecological threats, specific sound and air emission distribution etc.).

Moreover, and from the perspective of sustainability, the following dimensions have to be addressed: The social dimension of sustainability means, amongst others, that services of general interest have to be accessible for all, and with affordable costs. From an economic perspective, it is crucial that the financial investments are in a reasonable proportion to the expected benefits. The environmental postulates of sustainability request in particular the minimisation of the ecological footprint. The following sections provide some more background on these challenges.

2.1.2 Environmental challenges

Transport with its fundamental socio-economic functions on the one hand and environmental concerns on the other hand is often in a systemic conflict. A good provision of infrastructure is a key to socio-economic development. However, the environmental impact of traffic and mobility is enormous – especially in the Alpine region.⁹

Mountains function as natural barriers, forcing traffic flows onto a limited number of corridors, including some high mountain passes and tunnels. These transport corridors are often located in those valleys where population density is high. At the same time, the morphological shape of valleys often leads to higher concentrations of emissions. Due to the topography, the emission load in Alpine valleys is three times higher than in non-mountainous areas (inversion effects etc.). Therefore, some rural areas in the Alps have similar air quality problems as highly urbanised areas elsewhere.¹⁰ In addition, the increasing volume of freight and passenger traffic by road and rail leads to high noise levels in the narrow Alpine valleys. The 'amphitheater effect' results in strong noise propagation along the valley and uphill.¹¹ Another environmental challenge is the barrier or fragmentation effect of habitats caused by traffic routes and the associated separation of animal populations and their migration.

The Alps are an important transit region as they are located between major economic centers such as Milan, Munich and Vienna. In recent decades, the traffic volume crossing the Alps has increased significantly.¹² The high growth rates of freight transport in the mountain regions are the result of the growing economic integration in Europe.

It must be emphasised that climate change is a major issue in the Alpine region, in particular due to its accelerated pace. The urgency of measures towards a decarbonised transport system is obvious. The Alpine Climate Board has developed concrete pathways in order to implement the Alpine Climate Target System 2050, including the transport sector.¹³

9 https://www.alpconv.org/fileadmin/user_upload/Organisation/TWB/Transport/2-Report_policies_FIN.pdf, <https://www.eea.europa.eu/publications/climate-change-impacts-and-vulnerability-2016>

10 https://www.alpconv.org/fileadmin/user_upload/Organisation/TWB/Transport/Transport_Annex4_IT_Air-quality-sustainable-mobility.pdf

11 https://www.alpconv.org/fileadmin/user_upload/Fotos/Banner/Topics/transport/AlpineConvention_TransportWG_ExternalCostsNoise_112018_web.pdf

12 <https://transport.ec.europa.eu/system/files/2020-07/2020-alpine-traffic-observatory-key-figures-2019.pdf>

13 <https://alpineclimate2050.org/climate-action-plan-2-0/transport/>

2.1.3 Accessibility challenges

As mentioned above, the Alps are part of the Trans-European Transport Network (TEN-T). Seven of the nine core trans-European corridors cross the Alps. Some pass the mountains on a north-south axis (Scandinavian-Mediterranean corridor, North Sea-Alpine corridor and Baltic Sea-Adriatic Sea corridor), while the Rhine-Danube corridor shows an east-west orientation.¹⁴ The Brenner Base Tunnel project is a link and core element of the Scandinavia-Mediterranean axis.¹⁵ In terms of transit transport, the number of net tons transported per year has increased on almost all corridors.¹⁶

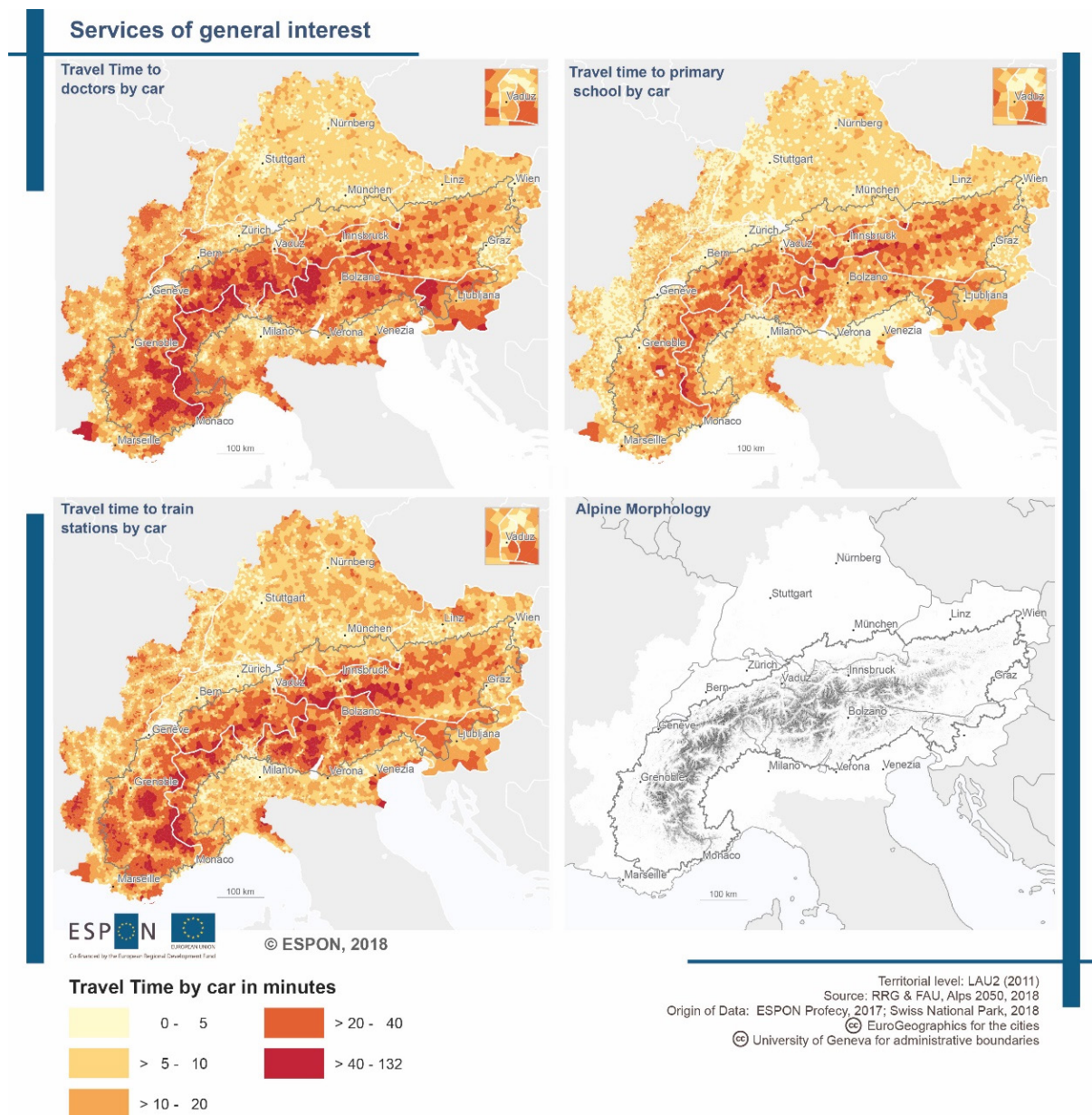


Fig. 4 Accessibility of services of general interest in the Alpine region (ESPON Alps2050, 2018)

14 https://transport.ec.europa.eu/system/files/2021-12/COM_2021_812_annex3_4.pdf

15 <https://www.bbtinfo.eu/ten-achse/>

16 https://www.tirol.gv.at/fileadmin/themen/verkehr/verkehrsplanung/Carole/Dokumente/Policy_scenarios_2030.pdf

One has to mention that the major transport links are not only important for transit purposes but also for the functioning of the Alpine economy. Many production and service sectors in the Alps are highly integrated into the European and global economy. The prosperity and demographic development of the Alps depends to a large extent on a functioning transport system that allows for a diversified economy.

However, Alpine connectivity is not only relevant from a European point of view, but also from an internal accessibility perspective. The accessibility of services of general interest in the Alps is shown in Fig. 4, in particular the travel times by car to doctors, primary schools and train stations.¹⁷ It is obvious that the provision of services of general interest is much more difficult in mountainous areas than in non-mountainous areas. This underlines the relevance of connectivity with regard to territorial cohesion and its socio-economic dimension.

2.2 The instrumental perspective

In addressing the interface between spatial planning & development and transport & connectivity in the Alps, we propose to take an instrumental perspective. Fig. 5 provides an overview of prominent documents and strategies in these fields.

	General	Spatial planning & development	Transport & connectivity
European	<ul style="list-style-type: none"> – UN 2030 Agenda for Sustainable Development – European Green Deal – 2030 Climate Target Plan – European Recovery Plan – Green Deal Industrial Plan 	<ul style="list-style-type: none"> – Territorial Agenda 2030 – Leipzig-Charter (2007) / New Leipzig-Charter (2020) 	<ul style="list-style-type: none"> – Sustainable & Smart Mobility Strategy – TEN-T Regulations of 2013 (currently revised)
Pan-Alpine	<ul style="list-style-type: none"> – "Alpine Convention (Framework Convention)" – EU Strategy for the Alpine Region (EUSALP) – Alpine Climate Target System 2050 	<ul style="list-style-type: none"> – Spatial Planning and Sustainable Development Protocol of the Alpine Convention – EUSALP Joint Paper on Spatial Planning – ESPON Alps 2050 – RSA 9: Alpine Towns – Works by OpenSpaceAlps and AlpPlan network 	<ul style="list-style-type: none"> – Transport Protocol of the Alpine Convention – Climate Neutral Alpine Mobility – Report on Policies for Sustainable Mobility in the Alps of the Alpine Convention – EUSALP Declaration on rail transport – iMONITRAF! Common transport strategy for the Alpine regions – RSA 1: Transport and Mobility in the Alps
National	<ul style="list-style-type: none"> – [div.] 	<ul style="list-style-type: none"> – CIPRA Handbuch Alpine Raumordnung (AT) – National plans, planning concepts and guidelines (e.g. Spatial Development Strategy (SI)) 	<ul style="list-style-type: none"> – National energy and climate plans (NECPs) – National mobility strategies (e.g. Austria's 2030 Mobility Master Plan, Swiss Transport Outlook 2050) – Technical plans
Regional & local	<ul style="list-style-type: none"> – [div.] 	<ul style="list-style-type: none"> – Plans, planning concepts and guidelines 	<ul style="list-style-type: none"> – Mobility strategies (e.g. Tirol auf Schiene) – Technical plans

Fig. 5 Relevant documents and strategies for the spatial planning and transport nexus (FAU, 2024)

17 https://www.espon.eu/sites/default/files/attachments/02_alps_2050_FR_annex_ATLAS.pdf

The figure shows a thematic differentiation in the columns:

- **'General'** documents comprise overarching strategies that do not concentrate on transport or spatial planning as such, even if they do have an impact on these fields. At the EU level, the European Green Deal and the 2030 Climate Target Plan have indirect implications, both on transport and connectivity and spatial planning and development. At the pan-Alpine level, the Alpine Convention and the EUSALP provide an important framework. These documents contribute to the UN Sustainable Development Goals on the global level.
- A series of **spatial planning and development** strategies include more formal (binding) and 'soft' approaches. At the European level, two perspectives are prominent: The Territorial Agenda 2030 (TA2030) and the Leipzig Charter (New Leipzig Charter of 2020). The TA2030's objectives for transport in mountain areas ask for reliable secondary and local transport networks, linked to transnational networks and urban centers, are essential for quality of life and business opportunities. At the pan-Alpine level, a number of soft instruments play an important role, some of them more in the form of reports than political documents (such as the ESPON Alps 2050 project). Only the Alpine Convention Protocol on Spatial Planning has a juridical character. At the national and regional level, a series of plans, guidelines, and strategies for spatial planning and development are in place.
- In the field of **transport and connectivity**, several documents provide different access points. The EU level is particularly relevant with the TEN-T Regulations and the Sustainable & Smart Mobility Strategy. Pan-Alpine approaches include the Transport Protocol of the Alpine Convention, the EUSALP Declaration on Rail Transport, the Common Transport Strategy for the Alpine Regions of iMONITRAF!¹⁸ and the first Report on the State of the Alps on Transport and Mobility¹⁹. Similar to spatial development, most of the documents are of a rather 'soft' nature. At national and regional level, a variety of instruments ensure concrete measures and technical implementation. In addition, a number of strategic documents are also in force at this level.

Obviously, this compilation is far from being complete, but it provides a structured overview. At the pan-Alpine level, it also shows the incremental character of both, the spatial and transport policies. In the coming years, the strategic development can take important steps towards a more integrated vision. The Alpine Spatial Development Perspective aims to contribute in this sense. The following sections provide some more background information on the current debates on policy options.

2.3 Policy options from the transport and connectivity perspective

The ongoing efforts to address the connectivity related challenges in the Alpine region are enormous. Simplifying largely, measures can be categorised in four groups, as illustrated in the following sections.

¹⁸ <http://www.imonitraf.org/i4Def.aspx?TabId=364&lang=en>

¹⁹ <https://www.alpconv.org/en/home/news-publications/publications-multimedia/detail/rsa1-transport-and-mobility-in-the-alps/>

2.3.1 Infrastructure investment

Improving infrastructure is a very obvious approach, but often a controversial issue. Prioritising investment is a challenge, given the high volumes that are necessary to make a difference.

The priorities have to be clarified: How to balance transit and internal accessibility aims? How to balance the different transport modes and intermodal infrastructure investment needs, etc.?

The bottlenecks in transport infrastructure are an important example, many of which have a cross-border dimension. As infrastructure was for a long time a purely domestic mandate, many border regions still suffer from relatively poor connectivity, despite the efforts of European programs and cross-border cooperation. The macro-regional cooperation has provided an inspiring example of how to support the closing of gaps. Moreover, large differences in per capita investment in rail infrastructure within the Alpine region must also be taken into account.²⁰

The ARPAF project (WP2 cross-border mobility in the Alpine region) showed that fast train connections mainly exist between metropolitan regions along the fringe of the inner-Alpine area (e.g. Milano-Verona, Munich-Vienna).²¹ Moreover, national rail connections tend to be much better than international ones. This is due to the high path-dependency of transport infrastructure, which relies on large investments and long planning and implementation periods.

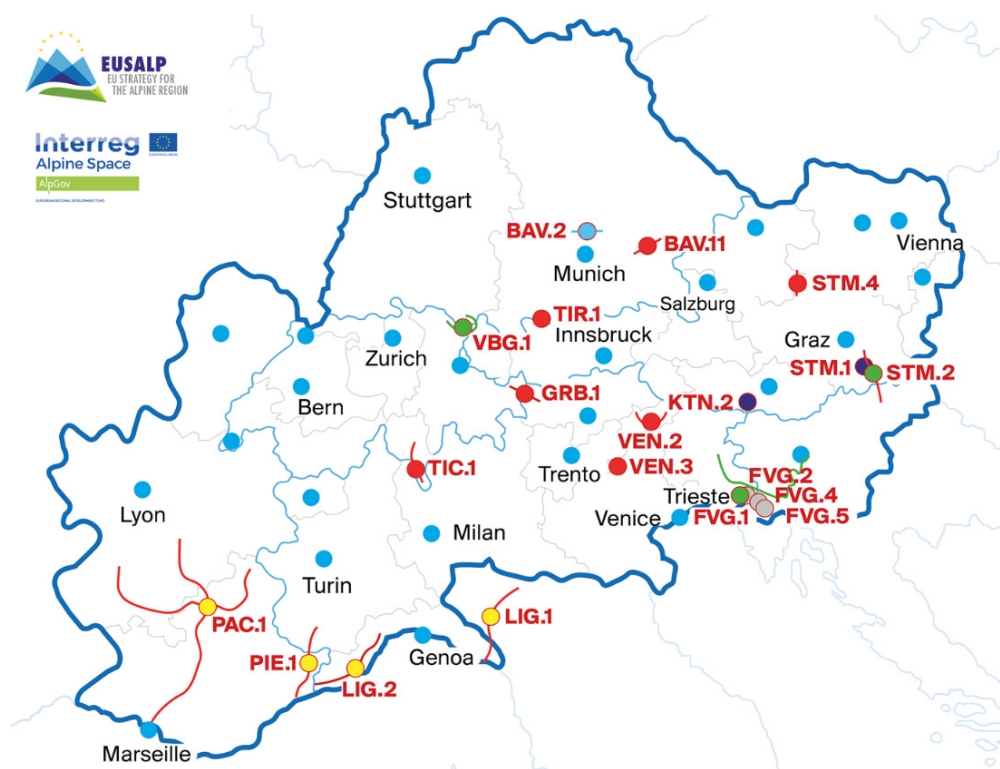


Fig. 6 Sustainable mobility solutions with high macro-regional relevance in the Alpine region (**Cooperation:** FVG.2: COMODALCE, FVG.4: New cross-border rail, FVG.5: SMARTLOGI; **New infrastructure:** GRB.1 Alpine Crossrail, STM.4: Alpine Western Balkan Corridor, TIC.1: AlpTransit Sud, TIR.1: Fernpass Railway, BAV.11: Four-track expansion, VEN.2: Treno delle Dolomiti, VEN.3: Collegamento Ferroviario; **Public transport rail:** STM.2: Inter-Regio rail, FVG.1: CROSSMOBY, VBG.1: Bodensee-S-Bahn S7; Terminal infrastructure: KTN.2: Logistics Center Austria South, STM.1: Cargo Center Graz (CCG); **Upgraded, electrified infrastructure:** LIG.1: Parma; LIG.2: Genoa-Marseille, PAC.1: Multimodal axis Valence-Val de Suze, PIE.1: Cuneo-Ventimiglia-Nice; **Digitalisation, ticketing:** BAV.2: Expansion of the MVV network; EUSALP, 2018)

20 <https://de.statista.com/statistik/daten/studie/70006/umfrage/investitionen-in-schieneinfrastruktur-pro-kopf/>

21 <https://www.alpine-region.eu/projects/arpaf-crossborder>

Based on these insights, the EUSALP Action Group 4 on mobility has prioritised sustainable mobility solutions in the Alpine Region with a high macro-regional relevance. So far, after two assessment rounds, 20 projects have been included in this group, many of them having a cross-border dimension (see Fig. 6).²² This procedure helps to communicate the projects' support by the macro-region towards decision-making authorities at all levels.

2.3.2 Digitalisation and technical optimisation

Digitalisation is a major trend that can improve the efficiency and also the comfort of mobility solutions. In principle, this applies to both passenger and freight transport.

In practice, this means e-ticketing for public transport and real-time booking for freight, artificial intelligence for timetable optimisation, on-demand services for last-mile mobility, and many other options. Many sharing options are also based on digital (platform) solutions.²³ Even if the current state is experimental, autonomous driving has a potential for the accessibility and mobility, especially in peripheral regions.²⁴

Moreover, and more generally speaking, the trend towards digitalisation could reduce the need for mobility, e.g. in terms of teleworking, home-based healthcare services, e-banking services, e-government (e-ID, e-Voting) etc. However, it remains to be seen whether this will lead to a real reduction in mobility or rather to a change in mobility patterns (second homes, leisure mobility etc.).²⁵

Even if digitalisation can help optimising the use of transport infrastructure, it must be seen as an infrastructure demand, including hardware facilities (broadband qualities), software solutions (ticketing) and social issues (skills, digital divide etc.). In particular, the cross-border character of the Alpine region poses fundamental challenges for data infrastructure. A good digitalisation framework must be based on a harmonised (open) data infrastructure among different actors, including public institutions and private enterprises, involving different languages, technical solutions etc.²⁶

2.3.3 Modal shift measures

One of the key concerns in Alpine transport debates is to shift the modal share from road to rail (and partly soft mobility forms as bicycles). This is a cross-cutting objective and relevant for many policy options²⁷. It requires infrastructure investments, especially in attractive rail-based services and in interfaces linking different mobility modes. Pricing and ticketing are important issues, asking for simple solutions that integrate different transport and mobility modes. Information and marketing are also important parts of the mobility transition.

The Alpine Convention, EUSALP and the Alpine Space Program have all contributed to this field with a high number of activities. To mention just a few:

- The EUSALP AG4 on mobility promotes specifically intermodality and interoperability, amongst others with Alpine Platform of Knowledge (PoK) for Mobility and Transport²⁸
- The Alpine Convention Transport Working Group has recently formulated the report on policies for sustainable mobility in the Alps, summarising the key aspects of a more rail-based connectivity²⁹

22 https://www.alpine-region.eu/sites/default/files/uploads/result/1563/attachments/study_2018_-_overview_of_existing_pricing_components.pdf

23 <https://www.alpine-space.eu/project/e-smart-2/>

24 https://www.alpconv.org/fileadmin/user_upload/Organisation/TWB/Transport/3-Report_technologies_FIN.pdf

25 <https://www.eea.europa.eu/en/newsroom/news/digitalisation-can-support-shifting-to-more-sustainable-transport-in-europe>

26 https://www.alpine-region.eu/sites/default/files/uploads/publication/2468/publications/digitalization_and_services_of_general_interest.pdf

27 https://www.alpconv.org/fileadmin/user_upload/Organisation/TWB/Transport/Transport_Annex1_FR_Modal-shift.pdf

28 <https://www.alpine-region.eu/results/alpine-platform-knowledge-mobility-and-transport>

29 https://www.alpconv.org/fileadmin/user_upload/Organisation/TWB/Transport/2-Report_policies_FIN.pdf

- A series of INTERREG Alpine Space projects has supported these ambitions, e.g. with 'Linking Alps' or, more recently, 'H2MA (Green Hydrogen Mobility for Alpine Region Transportation)'

Fig. 7 shows the trend for trans-Alpine transport.³⁰ The mobility demand is increasing and the share of road-based transport is rising, despite all the efforts across the multi-level system. Thus, innovation and digitalisation of road logistics are essential to manage flows in the Alpine area, especially in an intermodal manner. These measures can be even more effective if infrastructural bottlenecks are addressed (e.g. maintenance management).

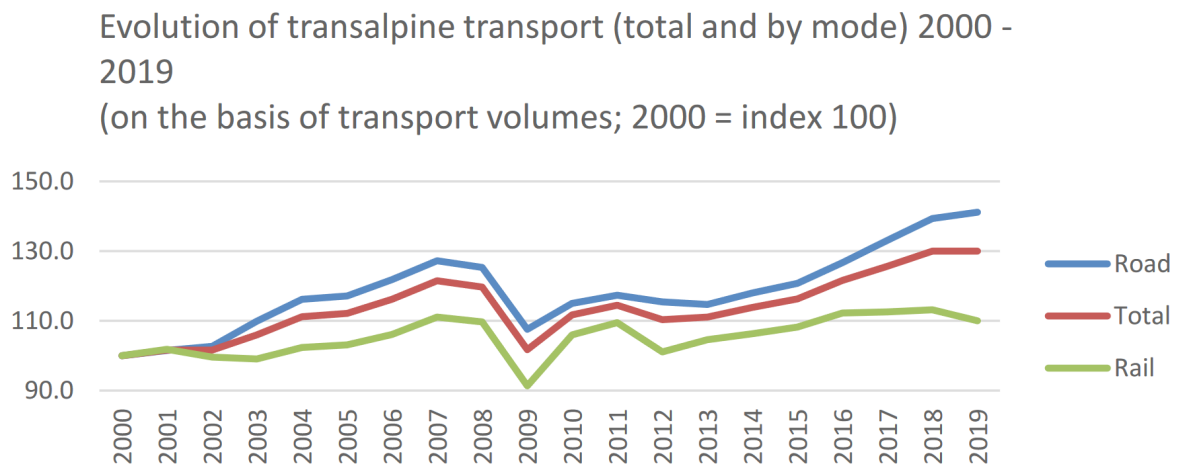


Fig. 7 Evolution of transalpine transport (Sigmoplan, Interface Transport, Füsseis, Trasporti e Territorio, 2020)

2.3.4 Cooperation and harmonisation

Most Alpine countries and regions have introduced measures to improve modal splits and reduce the environmental impact of freight and passenger transport. These measures range from regulatory measures, such as driving bans or speed limits, to pricing measures. However, uncoordinated approaches can lead to undesirable effects such as avoidance routing. The different toll policies in Alpine countries are amongst the most controversial issues.³¹ Fig. 8 shows the average tolls charged on the large Alpine transit corridors.³²

The toll level is amongst the most important factors influencing individual route choices. Avoidance routing can lead to congestions, higher maintenance costs and to higher air pollution. Against this background, a better-aligned toll policy is discussed as important policy option.³³

This example shows that policy development can profit from cross-border and Pan-Alpine alignment. The 'Follow up Zurich' process is promising in this regard. It provides a platform for the transport ministers of the Alpine countries. The aim is to find common solutions to the various challenges affecting the Alps and transport. These include safety, traffic management and modal shift from road to rail.³⁴

30 <https://transport.ec.europa.eu/system/files/2020-07/2020-alpine-traffic-observatory-key-figures-2019.pdf>

31 https://www.alpconv.org/fileadmin/user_upload/Organisation/TWB/Transport/1-Report_Eurovignette_FIN.pdf

32 https://www.alpine-region.eu/sites/default/files/uploads/result/1563/attachments/study_2018_-_overview_of_existing_pricing_components.pdf

33 https://www.alpine-region.eu/sites/default/files/uploads/result/1563/attachments/study_2018_-_overview_of_existing_pricing_components.pdf

34 <https://www.bav.admin.ch/bav/de/home/allgemeine-themen/internationale-abstimmung/suivi-de-zurich.html>

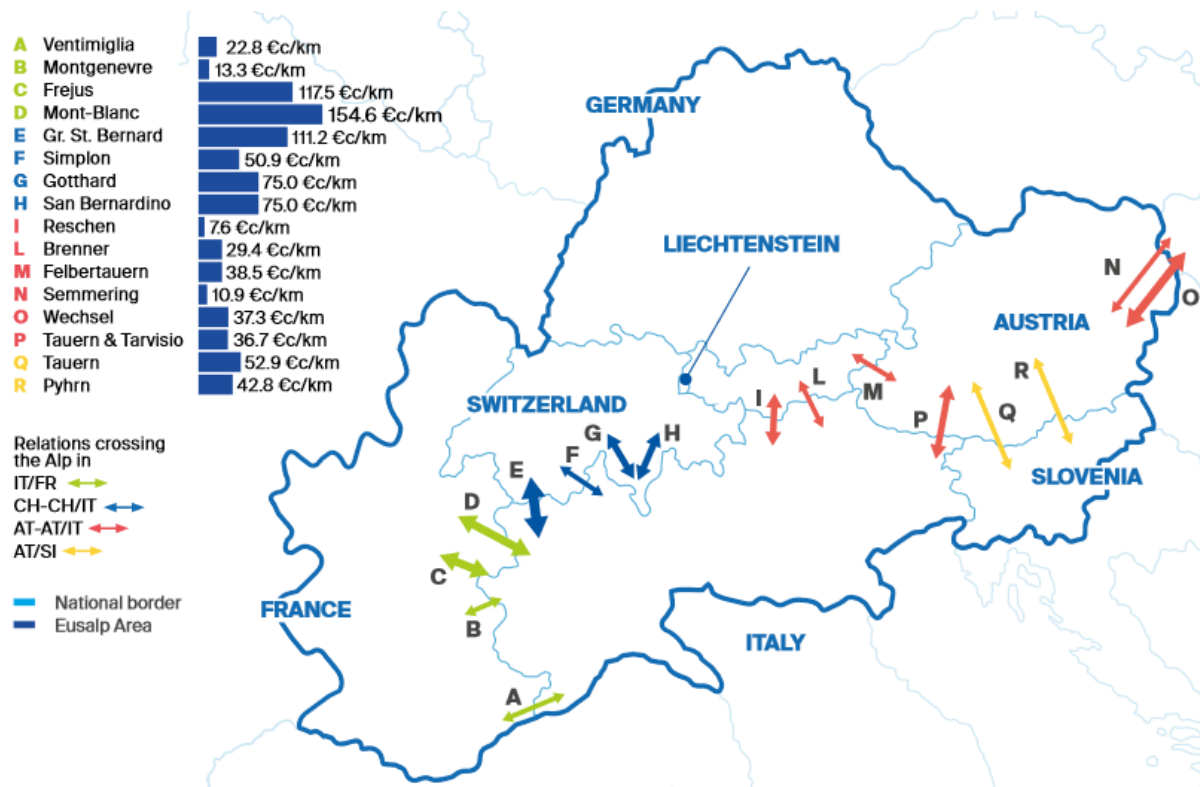


Fig. 8 Average tolls per km from a pan-Alpine perspective (EUSALP, 2018)

2.4 Policy options from the spatial perspective

The illustrated examples show that transport and connectivity have a strong spatial dimension. At the same time, spatial planning and development have a prominent link to connectivity issues. In highly simplifying terms, the role of spatial planning and development for transport and connectivity policies can be summarised in two lines of thought.

2.4.1 Implementation and cross-sectoral coordination

Obviously, spatial policies have a rather technical role to play as they have to ensure the implementation and realisation of infrastructure measures. For example, transport corridors have to be part of regional and municipal plans that guarantee planning reliability. Spatial planning might also help to anticipate future needs for more innovative solutions (e.g., areas for inter-operability facilities). In any case, planning solutions have to take a 'place-based perspective' that thoroughly considers the concrete contexts (touristic hotspots, inner Alpine peripheries, sub-metropolitan settlements etc.).

Spatial planning has a coordinative role to play. It has to anticipate potential contradictions and problems that can arise when other sectors come into play. Tourism infrastructure investment or new production facilities with freight flows are just two examples that illustrate the need for intersectoral coordination. Most of these issues are part of the daily planning routines on the domestic, regional, and local level. However, cross-border alignment and pan-Alpine strategies can rather be regarded as a potential, given the domestic character of spatial planning systems.

2.4.2 The strategic role of spatial structuring

Transport and connectivity measures are often discussed as a need for action *resulting* from existing spatial structures: passenger mobility between places of residence and of work 'exist'; economic flows between places of production and trade 'are there'; etc.

In a perfect planning scenario, the spatial structure *anticipates* transport and infrastructure needs. This applies in particular for the spatial organisation of settlement systems.³⁵ For example, it is important not to have an over-dense concentration that leads to congestions and overloads of the central areas. On the other hand, a too dispersed organisation leads to inefficiency and unnecessary mobility. The optimal planning principle in this context is *decentral concentration*, allowing for efficient linkages between the important activity zones and the efficiency of territorial functions. This means to define development and infrastructure corridors, functional linkages as well as protected zones. Even if – in practice – planning has to deal with existing structures, it can still influence future development. In this context, there are already a number of municipal and regional activities.

Ambitious planning does not only anticipate dynamics across sectors, but also formulates strategic objectives and long-term priorities in a thematic and geographical way. This applies to all scales – most obviously to the urban and regional scale, where this perspective is often part of the daily work. But it should also apply to border regions and on the transnational scale. The ESPON Alps 2050 project already showed first ideas without being very concrete.³⁶

³⁵ <https://alpinetowns.alpconv.org/>

³⁶ First steps towards a common vision from spatial planning & development were proposed in the ESPON project Alps 2050

2.5 Towards vision making

As pointed out, the number of general guidelines, policy documents, and concrete measures is high – both in the transport and connectivity field as well as in spatial planning and development. However, at least at the pan-Alpine level, the setting is somewhat incremental.

An Alpine spatial development perspective can complement this setting with a common vision including thematic, geographical and procedural aspects. The elaboration of a more concrete vision would help to broaden the debate and to speed up the implementation processes. This is where the two Alpine Convention working groups '**Spatial Planning and Sustainable Development**' and '**Transport**' came into play. In a joint meeting, the two working groups participated in a workshop (September 2023, Paris) to work towards integrated perspectives and visions (see Fig. 9).



Fig. 9 Participative mapping in the joint workshop of the Alpine Convention working groups 'Spatial Planning and Sustainable Development' and 'Transport' (Photos: Florian Lintzmeyer)

As a first step, the two working groups worked on important thematic interfaces between spatial development and transport. The most relevant interfaces discussed are mainly of a functional character. Accessibility of services of general interest, transport infrastructure, public transport, multimodality, interoperability and modal split/shift were addressed as key elements of Alpine transport and mobility. In Fig. 10 the Alpine infrastructure network is visualised. In addition, Fig. 11 illustrates the generalised documentation of the drawing elements of the workshop. At three work tables, the participants created three maps in a cooperative mapping approach. They drew maps on paper templates based on the following question: Where are the geographic priorities to address the link between spatial development and transport?

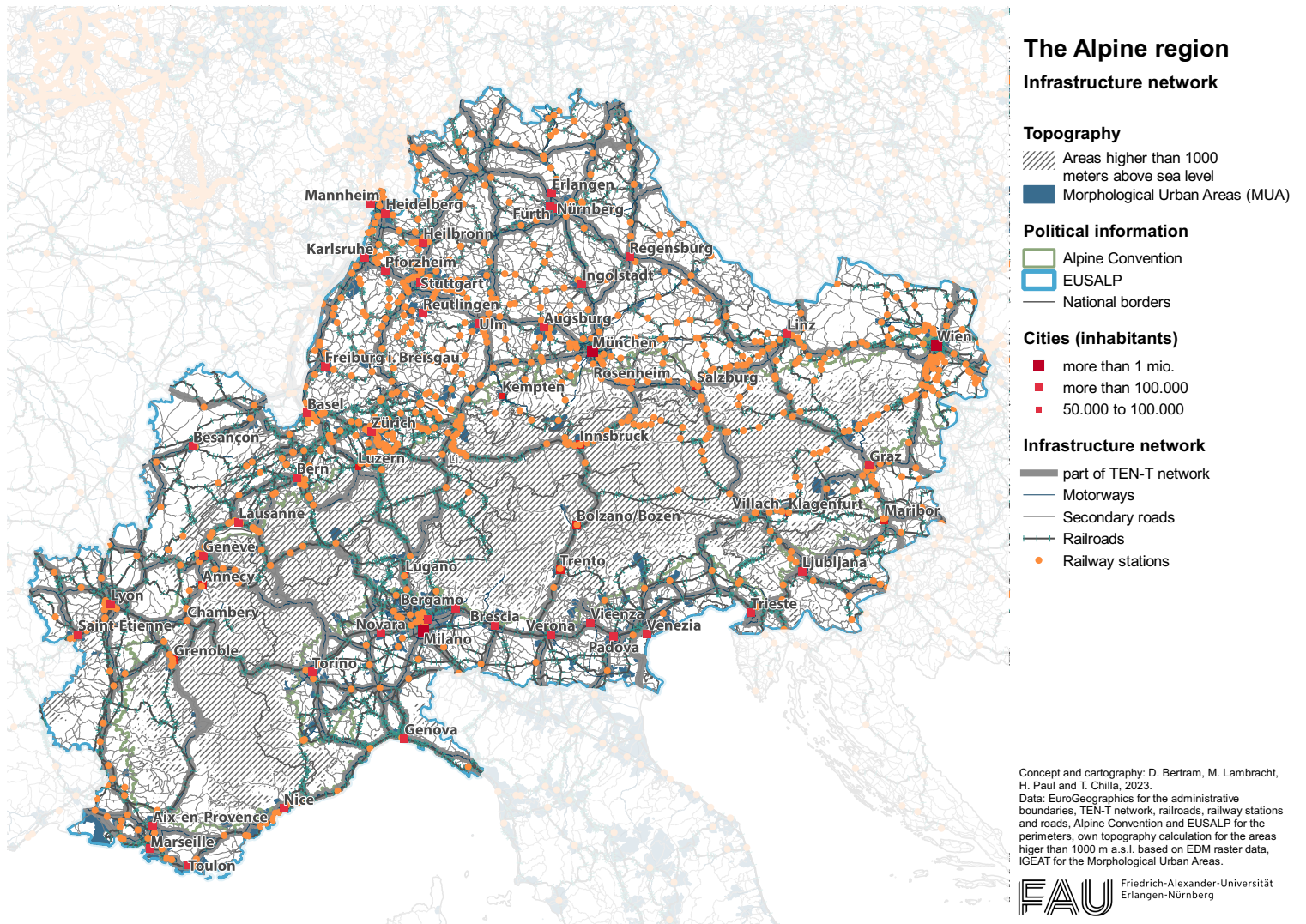


Fig. 10 Infrastructure network (FAU, 2024)

Indicator: Fig. 10 shows the Alpine infrastructure network consisting of railroads, railway stations, motorways and secondary roads and parts of the TEN-T network.

Description: In principle, the map illustrates a less densely organised infrastructure network in the inner-Alpine region than in the peri-Alpine region. The TEN-T network is mainly organised in a north-south direction crossing the Alps. The spatial pattern of railway stations and railroads displays clearly the morphology, in particular the valleys that host the rail infrastructure and railway stations.

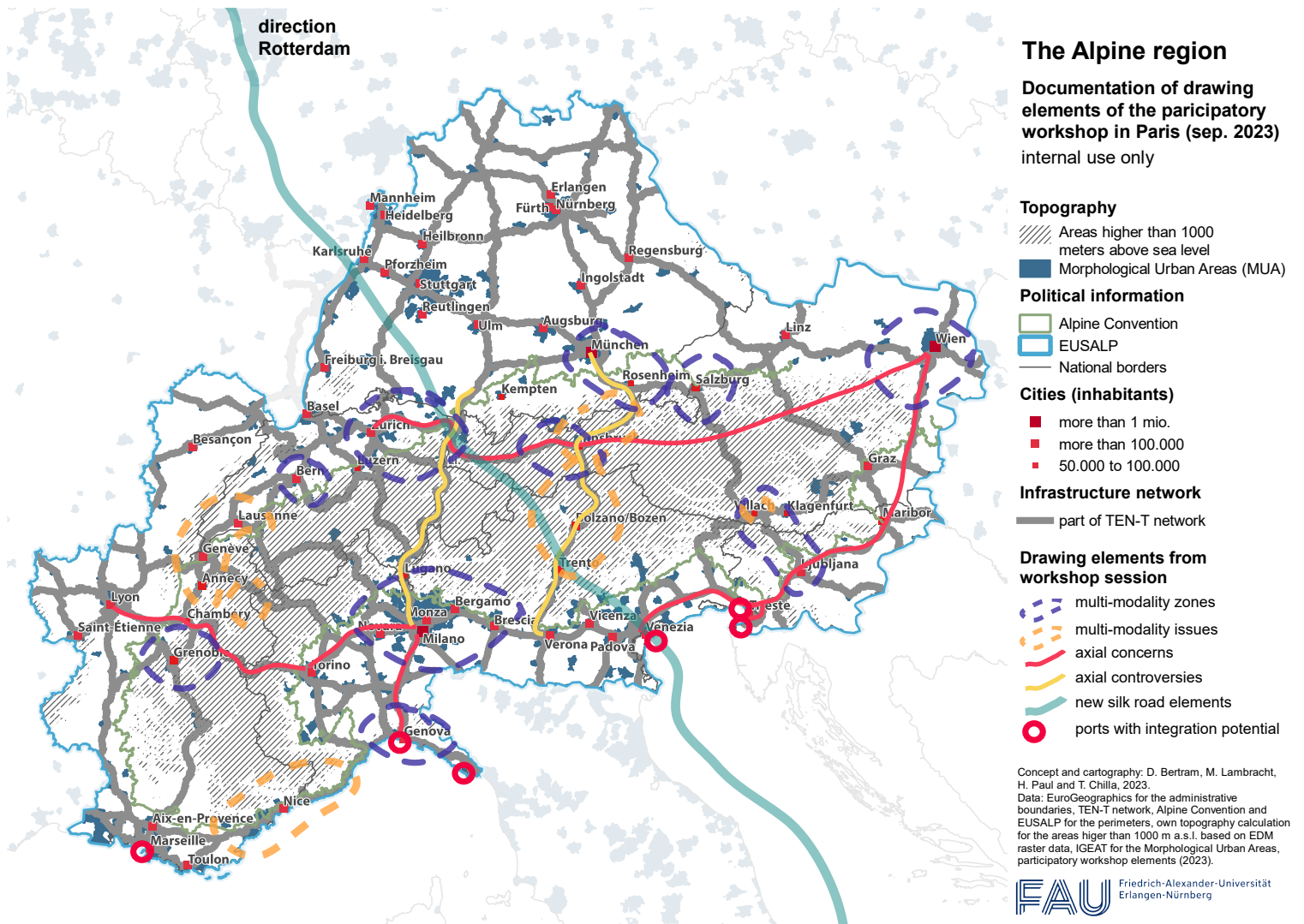


Fig. 11 Documentation of drawing elements of the workshop in Paris (FAU, 2024)

Indicator: Fig. 11 summarises and consolidates the results of the Paris workshop. The map focuses primarily on the areas identified in the workshop as those where the link between spatial development and transport is most relevant. The map differentiates between „multi-modality zones“ (purple signatures) and „multi-modality issues“ (orange signatures). Multi-modality zones were discussed as commuting zones where multi-modality elements are already implemented. ‚Multi-modality issues‘ are identified as areas with a particular need for further multi-modal activities. The red line signature indicates ‚axial concerns‘, i.e. corridors with high potential for improved connectivity. The yellow line signature refers to those corridors that have been identified as particularly sensitive. In addition to new silk road elements (teal signature), the map illustrates ports that the participants identified as potentially better integrated in the Alpine transport network. The map does not claim to be comprehensive; it merely documents the results drawn by the workshop participants.

Description: The overall picture illustrates high relevance of multi-modality within inner-Alpine commuting zones. The accessibility of important core areas in the Alps by multiple transportation modes is of key priority for sustainable Alpine spatial development. The Gotthard and Brenner axes have been discussed as specific bottlenecks. In this case, an integrated spatial development with a particular focus on modal split is essential. It is interesting that mostly east-west routes were discussed as axes with potential for further development (e.g. Lyon-Milan, Zurich-Vienna). A key aspect of Alpine spatial development is the integration of major ports into the existing infrastructural network as well as the discussions on new silk road elements.

The Alpine Spatial Development Perspective will further elaborate on these arguments.

3 Linking spatial development and green infrastructure

3.1 Challenges of green infrastructure and energy in the Alps

3.1.1 The sectoral focus of this paper: Green infrastructure

The concept of green infrastructure (GI) brings together natural and semi-natural areas in a networked manner. These areas provide a wide range of ecosystem services such as water purification, air quality, space for recreation, and climate mitigation and adaptation. The notion of GI also covers blue infrastructure (for aquatic ecosystems), as defined by the EU Commission.³⁷ Therefore in this document, the notion of GI is understood in a larger sense, including the 'blue' dimension and the links in particular to climate change/adaptation, biodiversity, land take and risk reduction.

Energy is currently a particularly relevant issue, especially in the Alpine region. The current dynamics of energy policy issues go hand in hand with questions of competition for land and with environmental issues. This is why this document also addresses energy aspects, that are closely linked to green infrastructure.

In terms of green infrastructure in the stricter sense, three dimensions are of high relevance.³⁸ First, multifunctionality of GI provides a series of environmental, social and economic benefits. This is very much linked to the debate of so-called ecosystem services (ESS).³⁹ Second, connectivity describes that individual GI elements must be part of an interconnected network. Ecological connectivity is a key precondition for the unimpeded movement of species and the flow of natural processes and includes a structural (physical dimension) and functional (species-specific) dimension.⁴⁰ Third, scale matters. GI assets are categorised on several spatial scales that come along with different functionalities. This is also important for spatial planning.⁴¹ In general, GI can be seen as a cross-cutting, multi-scale and multi-functional issue. The basic meaning of multifunctionality is to provide a variety of ecological, social and economic functions. An example of this is grassland, which is important for biodiversity, economy, landscape and tourism.⁴²

Green infrastructure is a conceptual tool for safeguarding the wide range of ecosystem services⁴³ through the strategic planning of green and open spaces.⁴⁴ GI can be considered as a potential element and/or objective of land use planning including zoning and protection measures at multiple spatial scales as well as including other sectoral policies (agriculture, transport, energy). Furthermore, process-oriented measures and strategic master planning are further instruments to strengthen GI networks and their functionalities. The EU strategy on GI – “Enhancing Europe’s Natural Capital” (2013) – underlines that consciously integrating the protection and enhancement of natural processes in spatial planning and development will benefit both biodiversity and society.⁴⁵

37 <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52019DC0236&qid=1562053537296&from=EN>

38 https://www.researchgate.net/publication/361636835_Shaping_a_sustainable_future_with_Green_Infrastructure

39 <https://doi.org/10.1016/j.scitotenv.2018.09.235>

40 <https://www.cms.int/en/topics/ecological-connectivity>

41 <https://doi.org/10.3390/land11091605>; <https://archive.espon.eu/green-infrastructure>; https://webassets.eurac.edu/31538/1661510139-d-t1-1-1b_green-infrastructure-for-the-alpine-space-from-theory-to-practise-part-b.pdf

42 <https://doi.org/10.1016/j.ecolind.2017.09.042>

43 <https://doi.org/10.1016/j.landusepol.2019.01.007>

44 <https://programme2014-20.interreg-central.eu/Content.Node/MaGICLandscapes-Green-Infrastructure-Handbook.pdf>

45 <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52019DC0236&qid=1562053537296&from=EN>

Further steps include the EU Biodiversity Strategy for 2030⁴⁶, the Nature Restoration Law⁴⁷ or the EUSALP Joint declaration on Alpine Green Infrastructure⁴⁸ which set specific targets for the enlargement of protected areas and the restoration of degraded areas.

Regarding blue infrastructure in the Alps, changing precipitation patterns and the gradual melting of glaciers are affecting the availability of water resources.⁴⁹ Shifts in precipitation patterns are putting additional strain on Alpine water resources, leading to unprecedented cases of both water scarcity and flooding. Winter seasons are characterised by a decrease in snowfall but an increase in rainfall, while summers are characterised by a decrease in water levels, which may lead to an increase in droughts, particularly in the southern and south-eastern regions of the Alps. Reduced snow cover and glacial melt further reduce the volume of stored water. It is essential to monitor the allocation of water resources for agricultural, domestic, hydropower and tourism purposes in order to manage conflicts and ensure the continued functioning of water ecosystems.⁵⁰

3.1.2 Climate change and adaption

Climate change patterns show a very high spatial differentiation. The Alps are particularly vulnerable due to their unique geography and ecosystems. Climate in the Alpine region is significantly affected by global warming.⁵¹ Fig. 12 shows that the Alpine region will face a higher temperature increase than the peri-Alpine regions.⁵²

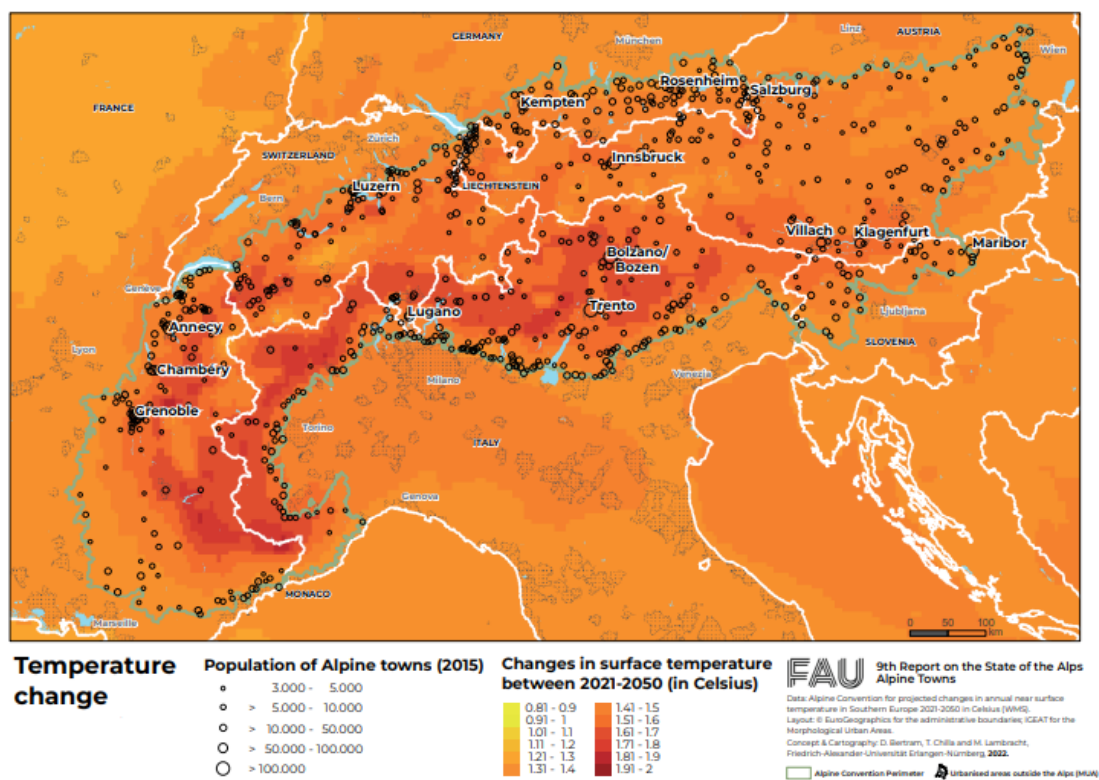


Fig. 12 Projected changes in surface temperature 2021-2050 (RSA9, 2022)

46 https://environment.ec.europa.eu/strategy/biodiversity-strategy-2030_en

47 https://environment.ec.europa.eu/topics/nature-and-biodiversity/nature-restoration-law_en

48 https://alpine-region.eu/fileadmin/user_upload/IMAGES_AND_DOCUMENTS/eusalp_political_declaration_green_infrastructure_final.pdf

49 https://www.alpconv.org/fileadmin/user_upload/Fotos/Banner/Topics/watermanagement/Report_water_conference_Annecy_EN.pdf

50 <https://alpineclimate2050.org/climate-target-system/water/>

51 https://www.alpconv.org/fileadmin/user_upload/Organisation/TWB/ACB/AlpineConvention_ClimateActionPlan2.0_EN.pdf

52 <https://alpinetowns.alpconv.org/wp-content/uploads/2022/10/rsa9-part-1-facts-maps-and-scientific-debates.pdf>

Already now, temperature increase is much higher in the Alps than beyond. Against this background, the Alps can be seen as a 'frontrunner' in the context of climate change, as they face the challenges of climate adaptation at an early stage and with a rapid pace.⁵³ Climate change in the Alps refers not only to rising temperatures, but also to changes in the seasonal cycle of precipitation, global radiation, humidity and precipitation extremes. Those dimensions are closely linked to natural hazards like floods, droughts, avalanches, landslides and others.⁵⁴

Green infrastructure can contribute to mitigating the effects of climate change in many ways. Most importantly, fostering GI helps to enhance resilience and adaptation to climate change, and through the CO₂ storage function of (semi-) natural ecosystems, GI also contributes to mitigation.⁵⁵ Fig. 13 describes the multiple territorial contexts and functional potentials of GIs in the Alpine region.⁵⁶



Fig. 13 Alpine Green Infrastructure (EUSALP)

3.1.3 Biodiversity challenges

The Alpine area, characterised by its diverse habitats, flora and fauna, faces multiple challenges that threaten its biodiversity. Amongst the most important challenges are habitat fragmentation and land use dynamics resulting from anthropogenic activities such as urban expansion, agricultural intensification and infrastructure development.⁵⁷ In this regard, ecological connectivity is a key concern that is directly linked to climate change, as adaptation to climate change requires a network of physically connected natural areas, combined with compatible land use practices, to allow species and populations to move between areas as needed. The changes in land use are leading to conflicts over land management priorities, highlighting the complex in-

53 <https://alpinetowns.alpconv.org/wp-content/uploads/2022/10/rsa9-part-1-facts-maps-and-scientific-debates.pdf>

54 <https://doi.org/10.1016/j.scitotenv.2013.07.050>

55 <https://doi.org/10.1016/j.jenvman.2014.07.025>

56 <https://alpine-region.eu/action-groups-publications/new-graphic-for-the-visualization-of-alpine-green-infrastructure> (All rights reserved – Contracting entity and owner of the graphic is the Bavarian State Ministry for the Environment and Consumer Protection)

57 https://www.researchgate.net/profile/Annapaola-Rizzoli/publication/216340110_Land_use_change_and_biodiversity_conservation_in_the_Alps/links/02e7e517a5c62b6a4f000000/Land-use-change-and-biodiversity-conservation-in-the-Alps.pdf

terplay between biodiversity conservation and socio-economic interests in the region. Habitat fragmentation is a particular challenge in the Alps due to the typical Alpine settlement system with its valley orientation and highly concentrated socio-economic dynamics, heavy traffic and infrastructure.⁵⁸

Moreover, the reduction of biodiversity in the Alps has significant consequences for ecosystem services, and, in the long run, human well-being, and socio-economic development. Ecosystem functions, such as water regulation, soil fertility, and carbon sequestration, are crucial for maintaining a critical ecological balance. Furthermore, the loss of biodiversity can indirectly affect tourism, an important economic sector in the region, as the landscape amenities that provide the basis for tourism are often biodiversity assets (see Fig. 14).^{59 60}

To summarise, it is crucial to preserve biodiversity in the Alps to maintain ecosystem resilience, support sustainable development, and safeguard the region's ecological heritage. To achieve this, stakeholders must address the complex interplay of environmental, landscape, social and economic factors.

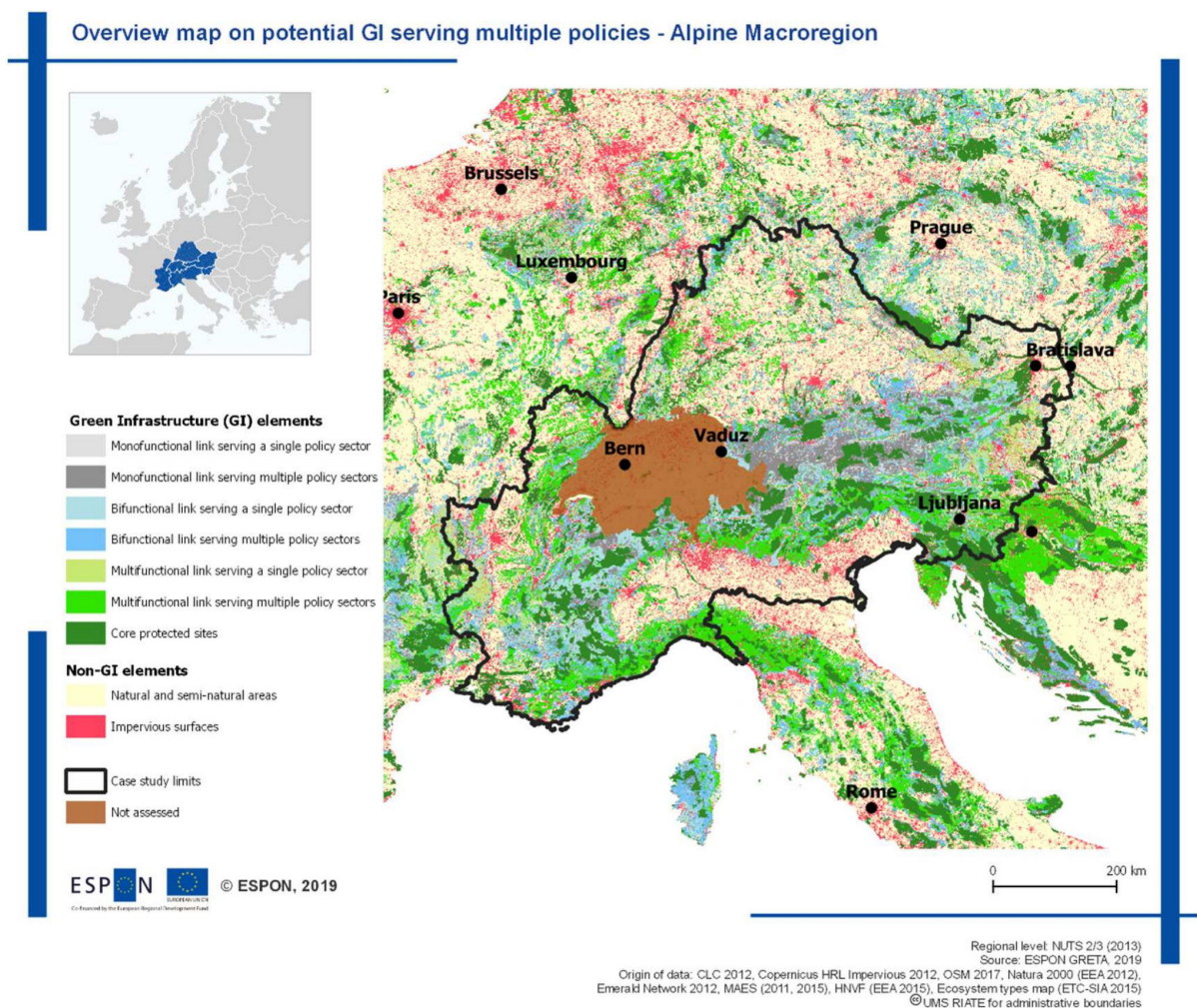


Fig. 14 Overview map on potential GI serving multiple policies (ESPON GRETA, 2019)

58 <https://alparc.org/de/alpine-resources/atlas-alpbionet2030>

59 <https://www.sciencedirect.com/science/article/pii/S0301479707002381?via%3Dihub>

60 https://archive.espon.eu/sites/default/files/attachments/GRETA_Alpine_Macro_Region.pdf

3.1.4 Land take challenges

Even though the pace of land take has slowed down in some Alpine countries, land is still being taken for settlements and technical infrastructure and the resulting sealing of the soil continues at many places in the Alpine region. Soil is a limited resource that cannot be renewed within a few human generations (Fig. 15).^{61 62} Also climate change is challenging Alpine soils. Climate change affects soil functions directly and indirectly. Direct effects include changes in temperature, precipitation and moisture regimes. Indirect effects include those caused by adjustments such as watering, changes in crop rotation and soil cultivation methods.⁶³

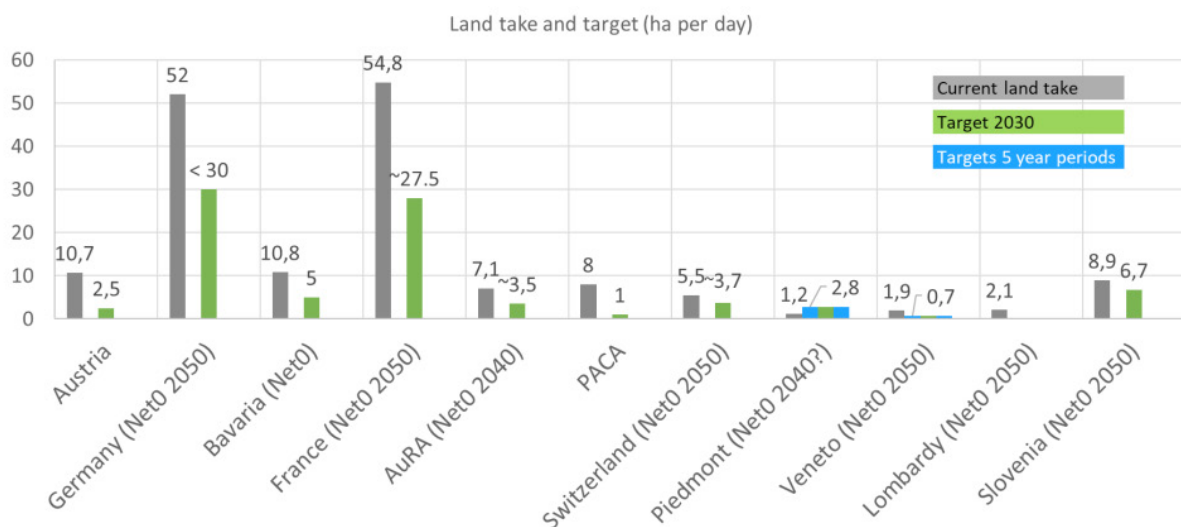


Fig. 15 Current land take and land saving targets in selected Alpine countries and regions (2,5 target for AT is not politically decided) (Alpine Convention, 2022)

Soil provides many ecosystem services that are essential for human life and is the basis for a wide range of human activities. Soil conservation is therefore of vital importance.⁶⁴ This is particularly true for mountainous regions such as the Alps, where soils are much more vulnerable and at risk due to the steep relief, shallow soils and longer formation times. The Alpine region shows heterogeneous land use patterns, with urban agglomeration along the valleys and depopulation in some remote areas. The limitation of the habitable surface increases the competition for different demands (such as settlement, transport and tourism infrastructure, energy production, agricultural infrastructure and production, environmental protection or measures to adapt to climate change).⁶⁵ Some Alpine regions, where a limited proportion of habitable land already imposes strict limits on the expansion of settlements, have adopted land conservation policies to a greater extent than regions where these resource constraints are less evident.⁶⁶ Obviously, spatial differences between peri-Alpine plains and inner-Alpine mountain areas have to be addressed. This geomorphological diversity of the Alpine regions demands to differentiate land take issues in the mountain area and beyond.

61 https://www.alpconv.org/fileadmin/user_upload/Organisation/TWB/Soil/Long-term-action-plan_soil-protection.pdf

62 https://www.alpconv.org/fileadmin/user_upload/Organisation/TWB/SPSD/CDR_ACTS_IP_SP1_3_Land_Saving_Targets.pdf

63 <https://doi.org/10.1002/ldr.3006>

64 https://www.alpconv.org/fileadmin/user_upload/Organisation/TWB/SPSD/CDR_ACTS_IP_SP1_3_Land_Saving_Targets.pdf

65 https://www.alpconv.org/fileadmin/user_upload/Organisation/TWB/Soil/Long-term-action-plan_soil-protection.pdf

66 https://www.alpconv.org/fileadmin/user_upload/Organisation/TWB/SPSD/CDR_ACTS_IP_SP1_3_Land_Saving_Targets.pdf

Land take comes along with the loss of agricultural land and open spaces.⁶⁷ Depending on the development dynamic, this leads to landscape degradation and GI fragmentation, resulting in the isolation of natural habitats and reduced ecological connectivity particularly at the lower altitudes.⁶⁸

3.1.5 Risk reduction challenges

The frequency and probability of disasters has increased and intensified due to climate change. Within the Alpine Convention region, a series of extreme events has been recorded in recent decades. The following map shows the distribution of such extreme events for debris flows and floods in catchment areas smaller than or equal to 100 km² (Fig. 16).⁶⁹ Even if the map suffers data availability problems, it becomes obvious that serious risks must be expected throughout the Alps, demanding proactive risk management strategies.⁷⁰

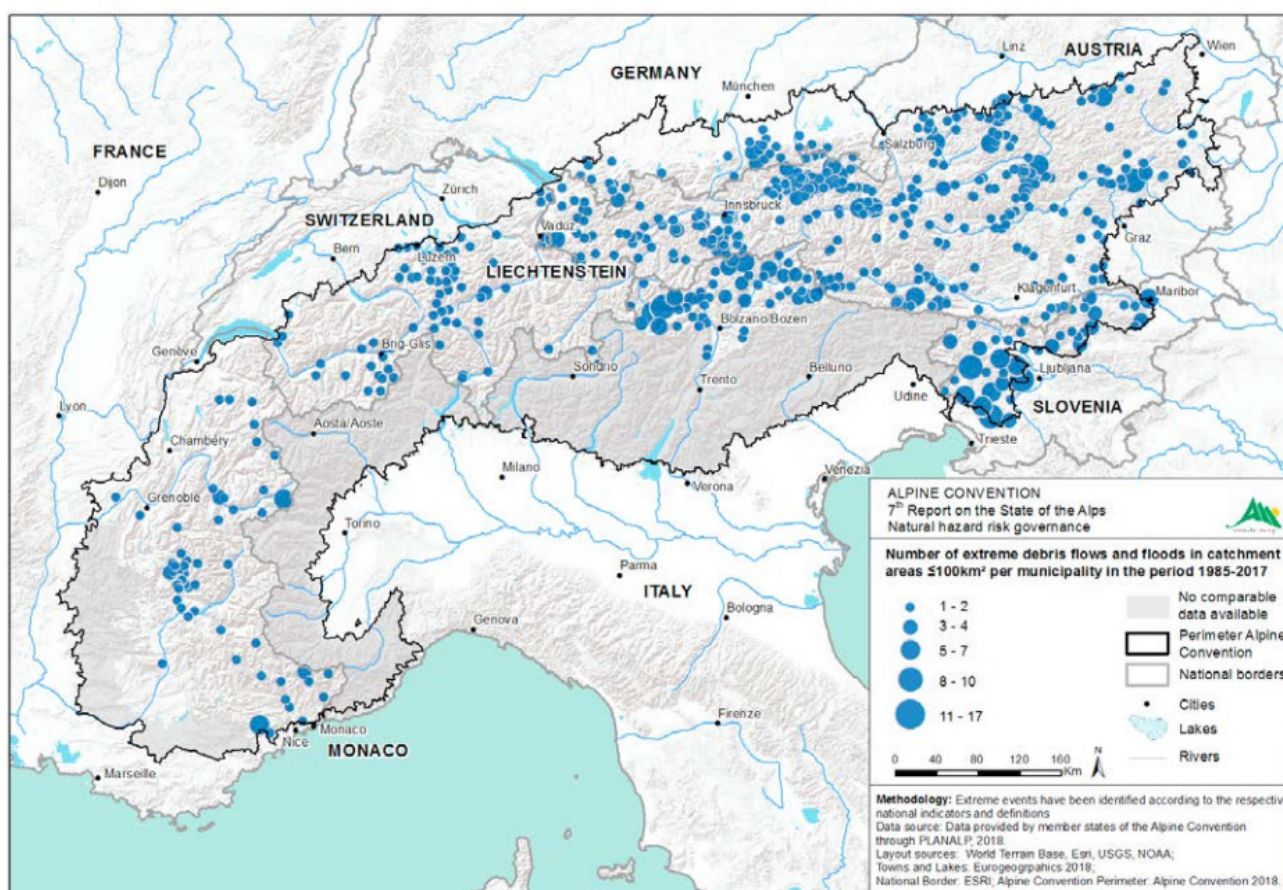


Fig. 16 Number of extreme debris and floods in catchment areas smaller than or equal to 100 km² in the period 1985-2017 (RSA7, 2019)

67 <https://www.arl-international.com/knowledge/thematic-collections/spatial-planning-open-spaces-and-green-infrastructure-alpine-region>
 68 https://www.arl-net.de/system/files/media-shop/pdf/pospapier/pospapier_133.pdf; https://www.alpconv.org/fileadmin/user_upload/Organisation/TWB/WISO/WISOLandscapeConnectivity_final_version.pdf
 69 https://www.alpconv.org/fileadmin/user_upload/Publications/RSA/RSA7_EN.pdf
 70 https://www.alpconv.org/fileadmin/user_upload/Publications/RSA/RSA7_EN.pdf

Green Infrastructure is essential for enhancing resilience and mitigating risks associated with extreme events in the Alps.⁷¹ It addresses challenges posed by extreme weather events, avalanches, debris flows, landslides, floods, droughts and heat periods. GI interventions such as vegetated buffers or retention zones can help to control the effects of rainfall, reducing the risks of flooding, erosion and landslides. Natural barriers, such as forests, can mitigate avalanche hazards by stabilising slopes. GI measures such as vegetation cover and soil stabilisation techniques are employed to intercept sediment transport and debris flows and to minimise erosion.⁷² Flood risks are reduced through strategies such as floodplain preservation and riverbank restoration, which enhance water storage capacity.⁷³ Studies have shown that GI initiatives have had promising results in climate change mitigation, managing floods, landslides among many other applications for risk reduction.⁷⁴ Integrating GI into planning and development can enhance Alpine resilience, ensuring sustainable communities and ecosystems in the face of extreme events. In addition, nature-based solutions (NbS) can help to adapt to climate risks.⁷⁵

3.1.6 Energy challenges

The Alpine region is a strategic area for the production (and storage) of renewable energy. In terms of production, the Alps host a series of renewable energy sources, including water for hydropower, (fire)wood, biomass, sun (photovoltaic) and wind power.⁷⁶

The Alps face various challenges during the energy transition and the involved demand for an increase in energy storage and powerline capacity. This transition is driven by the growing need for sustainable energy sources and grid stability. The production of renewable energy has an impact on the surrounding environment and ecosystems.⁷⁷ It comes along with competition regarding land use demands, including competition with conservation efforts, agricultural use, landscape character and tourism expectations.⁷⁸

The Alps as Europe's 'water towers' offer the opportunity for flexible, low-carbon power generation and energy storage. Hydropower facilities are challenged by the fast melting of glaciers, even if the exact impact is difficult to anticipate.⁷⁹ The energy transition at national and European level can be facilitated by increasing the capacity of pumped storage plants. However, the expansion of hydropower, especially pumped storage, is highly controversial due to environmental and biodiversity concerns and opposition in the concerned communities. In addition, the amount of water in rivers is becoming increasingly limited or erratic due to climate change.⁸⁰

Also wind power comes along with a number of potential conflicts. Many windmill projects are met with opposition. The reasons for this resistance include impacts on landscape aesthetics, threat to flora and fauna, noise level, and more.⁸¹ Community-based renewable energy projects are a promising approach to overcome subjective resistance at the local levels.

71 <https://doi.org/10.3390/su142316155>

72 <https://alpineclimate2050.org/climate-target-system/natural-hazards/>

73 https://www.alpconv.org/fileadmin/user_upload/Fotos/Banner/Organisation/thematic_working_bodies/Part_02/water_management_in_the_alps/4_FD_WFD.pdf

74 <https://doi.org/10.3390/su142316155>

75 <https://link.springer.com/article/10.1007/s10113-022-01998-w>

76 <https://doi.org/10.1659/MRD-JOURNAL-D-15-00071.1>

77 https://previous.iiasa.ac.at/web/home/research/researchPrograms/EcosystemsServicesandManagement/rechargegreen/Abschlussbericht-EU-RAC_kompr.pdf

78 <https://doi.org/10.1016/j.rser.2015.04.004>

79 <https://doi.org/10.3390/w12072011>

80 <https://doi.org/10.1659/MRD-JOURNAL-D-15-00069.1>

81 https://austriaca.at/0xc1aa5576_0x0029e652.pdf

In many Alpine regions, the use of forests for firewood has a long tradition. Although forest biomass for energy production is less polluting than fossil fuels, it has potential impacts on the environment and conflicts with competing interests and the demand for sustainable use of forests.⁸² Moreover, the aspect of CO₂ neutrality demands a cascading use of forest biomass. This refers to the efficient utilisation of resources through the use of residues and recycled materials for material purposes, with the aim of extending total biomass availability⁸³ and facilitating continuous reforestation. The pending revision of the EU's Renewable Energy Directive in 2023 (RED III) consequently strengthens the sustainability criteria for biomass. At the same time, it excludes the use of forest biomass from areas that are of particular relevance for biodiversity. The limits to the use of forests as an energy source have been highlighted in the recent debate at EU level on the continued inclusion of wood as a renewable energy source.⁸⁴

In addition to these energy production challenges, ensuring a reliable energy supply, especially during the winter months, is a particular concern for the Alpine region. Photovoltaic systems, a key component of renewable energy portfolios, may experience reduced efficiency in snowy conditions, raising questions about their reliability in meeting energy demands during peak winter periods. Developing strategies to enhance the resilience of renewable energy systems and ensure consistent energy production throughout the year is essential for meeting the energy needs of Alpine communities while minimising vulnerability to climatic variability.⁸⁵

This has to be seen against a fundamental geographical question: In particular, in terms of water supply, wood delivery and energy storage, the Alpine region serves the functioning of outer Alpine, often metropolitan areas. The question is what the limitations are from a sustainable development perspective.⁸⁶

When discussing energy challenges, the idea of energy self-sufficiency plays an important role. This concept combines adopted consumption patterns and the use of innovative and efficient supply systems (e.g. passive houses⁸⁷). Energy saving and efficiency contribute to CO₂-reduction.⁸⁸

82 <https://pure.iiasa.ac.at/id/eprint/12117/1/Energy%20&%20nature%20in%20the%20Alps%20-%20a%20balancing%20act.pdf>

83 https://knowledge4policy.ec.europa.eu/glossary-item/cascading-use_en#:~:text=Cascading%20use%20is%20the%20efficient,availability%20within%20a%20given%20system

84 https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=OJ:L_202302413

85 <https://www.gantner-instruments.com/blog/innovation-in-alpine-solar-overcoming-winter-energy-challenges/>

86 Bätzing (2015): Die Alpen: Geschichte und Zukunft einer europäischen Kulturlandschaft (p. 366): <https://www.jstor.org/stable/j.ctv128fn6r>

87 <https://www.yourhome.gov.au/passive-design/passive-house>

88 <https://doi.org/10.1659/MRD-JOURNAL-D-11-00056.1>

3.2 The instrumental perspective

In addressing the manifold challenges of green infrastructure as presented above, the links to spatial planning and development are highly relevant. The sectoral fields of GI offer a series of important instruments, and so does spatial planning and development. Understanding and applying the appropriate tools throughout the multi-level system is an ambitious endeavor, as Fig. 17 shows.

	General	Spatial planning & development	Green infrastructure & energy	
			Technical planning (land use & zoning)	Strategic planning (target formulations)
European	<ul style="list-style-type: none"> – UN 2030 Agenda for Sustainable Development – European Green Deal – 2030 Climate Target Plan – European Recovery Plan – Green Deal Industrial Plan 	<ul style="list-style-type: none"> – Territorial Agenda 2030 – Leipzig-Charter (2007) / New Leipzig-Charter (2020) 	<ul style="list-style-type: none"> – Habitats Directive / Birds Directive (Natura 2000) – Water Framework Directive – <i>IUCN classification of protected areas*</i> – <i>UNESCO labels*</i> 	<ul style="list-style-type: none"> – Green Infrastructure Strategy – Biodiversity Strategy 2030 – Roadmap to a Resource Efficient Europe – Regulation on the governance of the energy union and climate action – EEA strategy on transforming EU land use and the Common Agricultural Policy (2023-27)
Pan-Alpine	<ul style="list-style-type: none"> – "Alpine Convention (Framework Convention") – EU Strategy for the Alpine Region (EUSALP) – Climate Action Plan 2.0 – Alpine Climate Target System 2050 	<ul style="list-style-type: none"> – Spatial Planning and Sustainable Development Protocol of the Alpine Convention – EUSALP Joint Paper on Spatial Planning – RSA 9: Alpine Towns – <i>ESPON Alps 2050*</i> 		<ul style="list-style-type: none"> – Soil conservation, mountain farming, mountain forests, energy, nature protection & landscape conservation Protocol of the Alpine Convention – RSA 10: Quality of Life – <i>Works by OpenSpaceAlps and AlpPlan network on ecological connectivity*</i>
National	– [div.]	<ul style="list-style-type: none"> – National plans, planning concepts and guidelines – <i>CIPRA Handbuch Alpine Raumordnung (AT)*</i> 	<ul style="list-style-type: none"> – National plans, planning concepts and guidelines on land use and zoning (e.g. National Spatial Development Strategy, S; Parke von nationaler Bedeutung, CH) 	<ul style="list-style-type: none"> – National strategies (e.g. national climate and energy plans, national concepts on green infrastructure)
Regional & local	– [div.]	<ul style="list-style-type: none"> – Plans, planning concepts and guidelines 	<ul style="list-style-type: none"> – Regional plans, planning concepts and guidelines on land use and zoning (e.g. Vorranggebiete Windenergie in BY, Vorarlberger Weißzonen, Alpenplan in BY) 	<ul style="list-style-type: none"> – Regional strategies (e.g. Plan climat de la Région Sud)

*non-litigable context documents

Fig. 17 Relevant documents and strategies for the spatial planning and green infrastructure nexus (FAU, 2024)

The columns differentiate three thematic perspectives:

- **'General'** documents include overarching strategies that do not focus on GI or spatial planning/development as such, even if they do have an impact on these fields. As mentioned in **chapter 2.2**, there are several strategic documents with cross-cutting implications at the European level as well as at the pan-Alpine level.
- The relevant documents and strategies from the point of view of **spatial planning and development** are listed in **2.2**.
- In the field of **green infrastructure**, several documents provide access points. GI must be seen as a cross-sectoral issue (biodiversity, recreation, energy etc.). The overview differentiates between documents with a specific focus on technical planning and those with a strategic approach. In the field of GI, technical planning mainly refers to land use and zoning approaches. In the context of strategic planning, the documents refer mainly to vision-making and target formulations. At the EU level, the 'Habitats and Birds directives' are the key instruments with a rather technical character (resulting in the Natura 2000 network); for blue infrastructure, the 'Water Framework Directive' has to be mentioned.

At national and regional level, a variety of instruments ensure concrete measures and technical implementation. At the pan-Alpine level, technical planning instruments are not established. However, in the field of strategic planning, the multiplicity of target formulations and vision-making documents is numerous. There are several documents focusing on green infrastructure from a vision-making perspective. Pan-Alpine approaches include several protocols of the Alpine Convention (soil protection, mountain farming, mountain forests, energy, nature protection & landscape conservation; not for water), as well as the EUSALP joint declaration 'Alpine Green Infrastructure - Joining Forces for Nature, People and Economy'. In parallel, a number of soft instruments play an important role, mostly in form of reports (such as project results by AlpBioNet and OpenSpaceAlps and the AlpPlan network's position paper on safeguarding ecological connectivity and open spaces in general). At national and regional level, a variety of strategic documents formulate targets and strategic pathways.

Obviously, this compilation is not intended to be complete, but it provides a structured overview of the relevant instruments. The collection of different instrumental formats throughout the governance system has grown over decades, without always having cross-sectoral coordination in mind. The Alpine Spatial Development Perspective aims to contribute towards an integrated strategy. The following sections provide some more background information on the current debates on policy options.

3.3 Sectoral policy options

The current efforts to address challenges regarding green infrastructure in the Alps are various. Simplifying to a large extent, the measures can be classified into four thematic groups, as presented in the following sections.

3.3.1 Ecological connectivity

The Alpine landscape is highly diverse and characterised by a wide variety of specific elements. Natural features such as meadows, forests, pastures, water bodies and elements of human use such as settlements, roads and railways are part of the Alpine area.⁸⁹ These infrastructure elements frequently fragment habitats and endangers biodiversity, as mentioned earlier.⁹⁰ In this context, area protection plays an important role.⁹¹ The concept of ecological connectivity aims to limit and channel human activities in a way that allows for sufficient exchange between flora and fauna habitats.⁹² It is important to note that barriers to ecological connectivity are not only caused by human activities, but also by the Alpine topography.⁹³

89 https://www.cipra.org/en/dossiers/13/dateien/341_en/@@download/file/Hintergb_EcoNetw_en.pdf?inline=true

90 <https://www.alparc.org/biodiversity-protection-in-times-of-climate-change/biodiversity-and-ecological-connectivity>

91 <https://www.arl-net.de/de/shop/safeguarding-open-spaces-alpine.html>

92 https://www.bmu.de/fileadmin/Daten_BMU/Pool/Broschueren/alpine_nature_2030_broschuere_en_bf.pdf-#%5B%7B%22num%22%3A262%2C%22gen%22%3A0%7D%2C%7B%22name%22%3A%22XYZ%22%7D%2C0%2C842%2C0%5D; https://alparc.org/parks2030

93 https://www.alpconv.org/fileadmin/user_upload/Organisation/TWB/WISO/WISOLandscapeConnectivity_final_version.pdf

The scientific debate defines ecological connectivity as „the degree to which this landscape facilitates or impedes movement between resource patches“. ⁹⁴ In this context, concepts of ecological/habitat/landscape connectivity have become highly relevant in nature conservation. Ecological networks consist of core areas that provide the necessary resources for the relevant species. The idea is that core areas should be complemented by buffer zones and connected by ecological corridors (Fig. 18). ^{95 96}

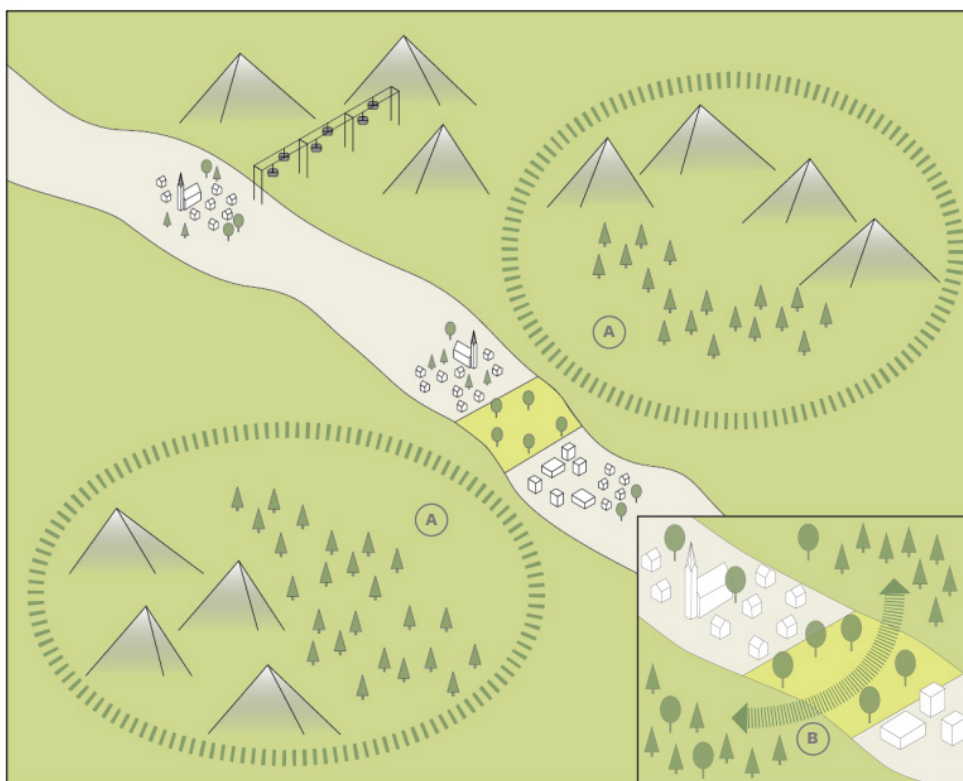


Fig. 18 Large-scale continuous open spaces (A) and small-/mid-scale open spaces (B) (ARL, 2022)

The awareness for ecological connectivity has grown over the last years, in particular in the context of climate and land use change. There is an ongoing debate on the relevance of additional area protection in the Alpine region to improve ecological networks, also in the context of meeting the targets of the EU Biodiversity Strategy for 2030 and the EU Nature Restoration Law. ⁹⁷ Overall, ecological connectivity is a very popular instrumental concept for nature conservation and biodiversity protection. ⁹⁸ A series of research projects and studies (e.g. AlpBio-Net, OpenSpaceAlps, PlanToConnect, Alpine Park 2030, PLACE report on spatial planning & ecological connectivity) take a pan-Alpine perspective to discuss biodiversity, climate adaptation, and ecological connectivity in the spatial policies of the Alpine countries. ⁹⁹ Fig. 19 shows a recent approach of mapping ecological connectivity in the Alpine region. ¹⁰⁰

94 <https://www.cms.int/en/topics/ecological-connectivity>; https://www.alpconv.org/fileadmin/user_upload/Organisation/TWB/EcoNet/PLACE_Report_on_Spatial_Planning_and_Ecological_Connectivity.pdf

95 https://www.arl-net.de/system/files/media-shop/pdf/pospapier/pospapier_133.pdf

96 <https://journals.openedition.org/rga/808?lang=en>

97 https://www.bmu.de/fileadmin/Daten_BMU/Pool/Broschueren/alpine_nature_2030_broschuere_en_bf.pdf-#%5B%7B%22num%22%3A262%2C%22gen%22%3A0%7D%2C%7B%22name%22%3A%22XYZ%22%7D%2C%2C842%2C0%5D

98 https://www.arl-net.de/system/files/media-shop/pdf/fb/fb_007/fb_007_gesamt.pdf

99 <https://www.alpine-space.eu/project/openspacealps-2/>; <https://www.alpine-space.eu/project/plantoconnect/>; https://www.alpconv.org/fileadmin/user_upload/Organisation/TWB/EcoNet/PLACE_Report_on_Spatial_Planning_and_Ecological_Connectivity.pdf

100 <https://panorama.solutions/en/solution/alpbionet2030>

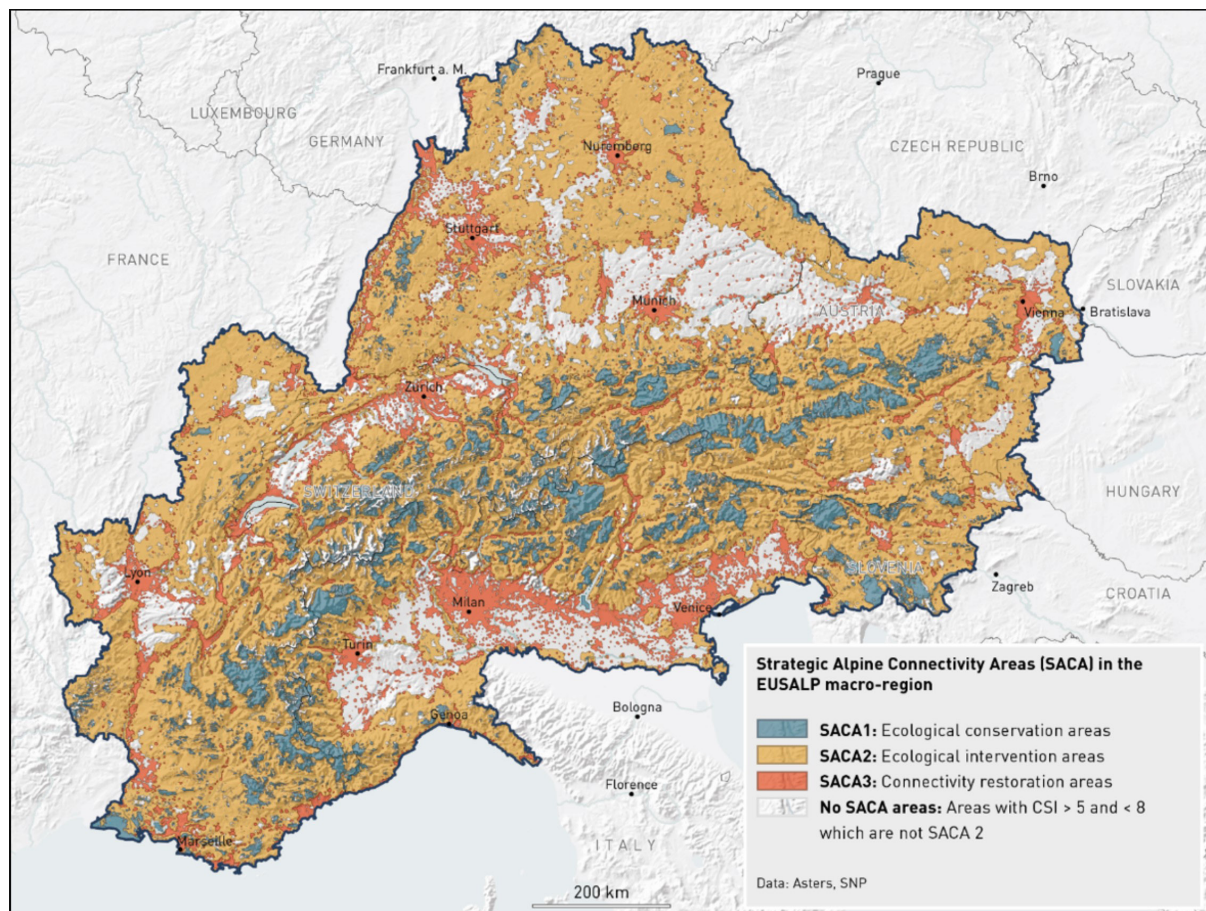


Fig. 19 Strategic Alpine Connectivity Areas (SACA) in the EUSALP macro-region (Alpbionet2030, 2021)

3.3.2 Sustainable agricultural and forestry approaches

In parallel, agricultural and forestry land use is highly relevant in the overall discussion on green infrastructure. In the Alpine region, both the ecological functions as discussed above and the productive functions like agriculture and forestry have to be safeguarded.¹⁰¹ However, both sectors are facing numerous challenges, like limited availability of arable land due to topography and ongoing land take dynamics. Additionally Alpine farming comes along with specific conditions that make it difficult to compete in a globalised economy (short vegetation periods and topography leading to high labor-intensity/specific machinery).¹⁰²

Multiple policy options can contribute to address these challenges. One can differentiate three categories, namely a) agricultural approaches, b) forestry approaches and c) cross-cutting approaches.

Financial promotion for mountain farming is a very relevant and widely practices policy option. Supporting traditional mountain farming helps to maintain pastures and the involved ecosystem services. In practice, this preserves specific Alpine landscapes, e.g. by sheep farming.¹⁰³

101 https://www.alpconv.org/fileadmin/user_upload/Organisation/TWB/MAMF/MAMF_Report_task1_2_ORGANIC_AGRICULTURE_MAMF_2021-2022.pdf

102 <https://www.alpconv.org/en/home/topics/mountain-agriculture/>

103 https://www.alpconv.org/fileadmin/user_upload/Organisation/TWB/MAMF/MAMF_Report_task1_2_ORGANIC_AGRICULTURE_MAMF_2021-2022.pdf

The labeling of Alpine products is another relevant policy option in this context. Territorial brands like European geographical indications and regional formats communicate specific qualities linked to the Alpine origin, often allowing for a stronger economic positioning. In order to line up with the strategies of the European Green Deal, the recent European Common Agricultural Policy (CAP, 2023-2027) is preparing to review the geographical indication and food labelling. The aim is to include more information into the labelling. Another policy option is the strengthening of advertising and marketing measures for Alpine products in general. In particular, mountain products require appropriate promotional strategies, both at the local scale and in the peri-Alpine area as higher pricing is to be reflected in more demanding working conditions and non-constant production yields are reflected in higher pricing.¹⁰⁴

Moreover, supporting organic farming is seen as a highly relevant policy option. For small mountain farms it is discussed if a modification of EU regulations for organic certification might be necessary. This could address current obstacles regarding the complex control and registration procedures. In addition, group certifications seem to be a possible way forward for small mountain farmers, as they can facilitate the achievement of economies of scale.

In terms of forestry, one of the most popular policy options discussed is providing appropriate governance and financing mechanisms in the Alpine region. More than 40% of the Alpine area is covered by forests, even if most of the wood is exported out of the Alps – not just as a construction material but also as a source of renewable energy. In the Alpine region, forestry is a characteristic feature of the landscape and sustainably managed forests provide protection against avalanches, floods and other natural disasters. Thus, the strategic spatial development of green infrastructure in general is of high relevance for the Alpine region.¹⁰⁵ The EUSALP discusses the goal of making the Alpine region a model region for green infrastructure. Therefore, the respective Action Groups initiate a pan-Alpine multidisciplinary and multi-stakeholder approach to ensure the sustainable provision of ecosystem services and at the same time fostering socio-economic benefits.¹⁰⁶

As a cross-cutting policy option for both the agricultural and forestry sector, the promotion of regional value chains is widely discussed (see chapter 4.3.5).

3.3.3 Integrated water management

As mentioned earlier, Alpine water resources fulfil a variety of functions, also beyond the inner-Alpine region (fresh water for drinking and industrial purposes, agriculture, leisure and hydropower; see Fig. 20).¹⁰⁷ These uses sometimes compete with each other and with the needs of aquatic ecosystems, while drinking water has the highest priority according to the EU Water Framework Directive.¹⁰⁸

Within the framework of pan-Alpine water management, the Alpine Convention has installed a water platform based on recommendations of the 2nd Report on the State of the Alps focusing on water and water management issues. In addition, the 'Action Plan on Climate Change in the Alps' illustrates several water-related issues, such as the reinforcement of the implementation

104 https://www.alpconv.org/fileadmin/user_upload/Organisation/TWB/MAMF/MAMF_Report_task1_2_ORGANIC_AGRICULTURE_MAMF_2021-2022.pdf; <https://www.alpine-space.eu/project/alpfoodway/>; https://www.alpconv.org/fileadmin/user_upload/Fotos/Banner/Organisation/the-matic_working_bodies/Part_02/mountain_agriculture_platform/PF_Berglandwirtschaft_Vermarktung_de_fin_Version.pdf

105 <https://www.alpconv.org/en/home/topics/forests/>

106 <https://www.stmuv.bayern.de/ministerium/eu/makroregionale/doc/eusalp2017.pdf>

107 https://blogs.fau.de/regionalentwicklung/files/2023/11/WP5_EUSALP_FAU.pdf

108 <https://www.alpconv.org/en/home/topics/water-management>; https://environment.ec.europa.eu/topics/water/water-framework-directive_en

of the 'European Water Framework Directive' and the prevention of water shortages.¹⁰⁹ Even if 'Integrated and Sustainable Water management in the Alps' is addressed in form of an Alpine Convention declaration, there is currently no Alpine Convention protocol on water issues.¹¹⁰

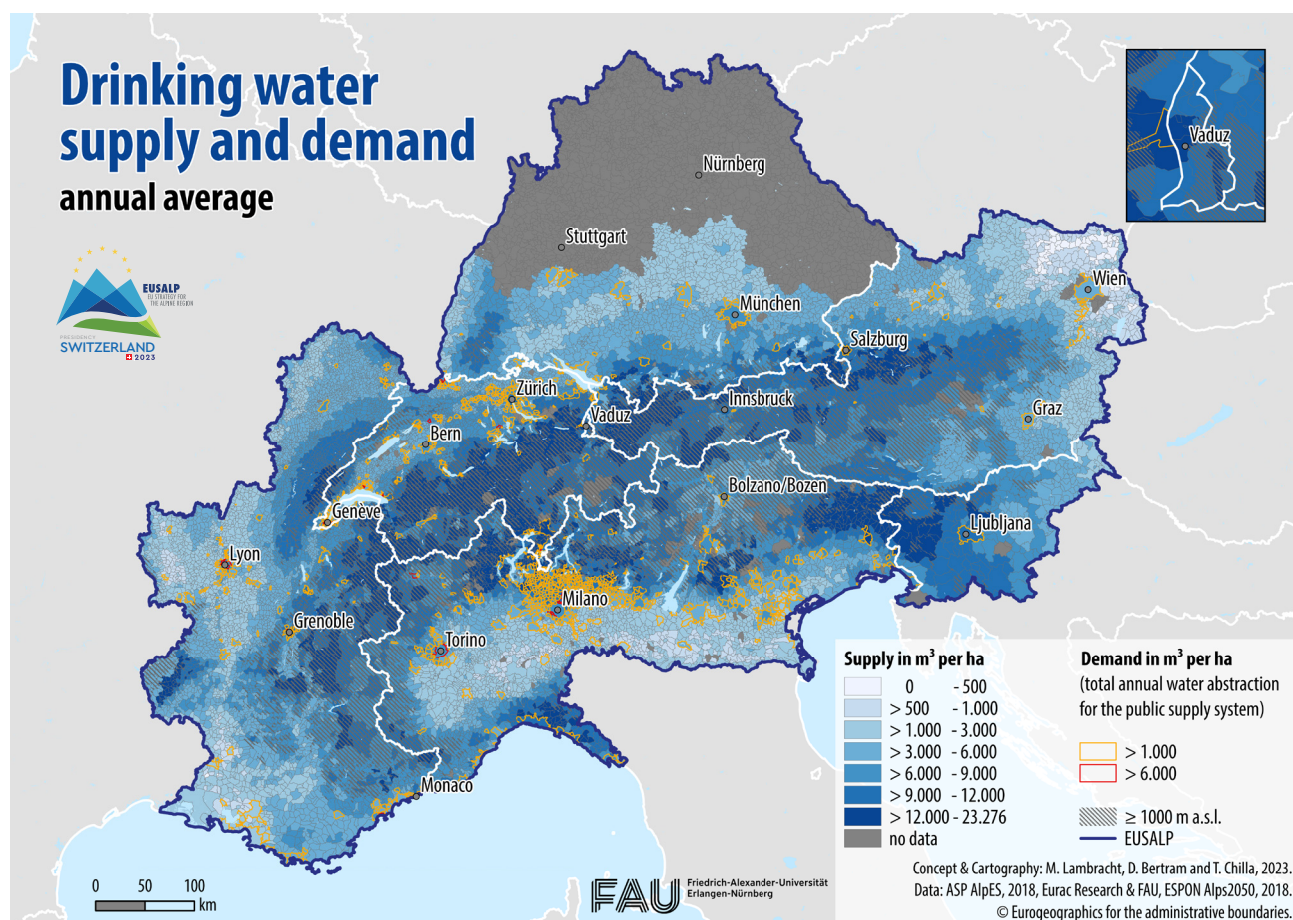


Fig. 20 Geographical patterns of drinking water supply and demand (FAU, 2023)

Given the challenges associated with water management, EUSALP Action Groups have decided to set up a task force. The overall goal is to enhance the transition toward a water-smart society led by stakeholders for a sound management of water resources.¹¹¹ The debate on Alpine water resources implies a series of 'soft' measures to strengthen 'upstream-downstream' solidarity. The most promising policy options seem to be promoting integrated water resource management to improve supra-regional and transboundary cooperation regarding natural hazards, water shortages and energy production. This goes hand in hand with continuous monitoring on water resources and water uses to enable evidence-based policy-making.¹¹²

In terms of aquatic biodiversity, the policy options include the protection of wild river sections, the restoration of degraded rivers and the conservation of biological corridors.¹¹³ Another highly relevant measure is resilient drought management. Over the last years, droughts

109 <https://www.alpconv.org/en/home/organisation/thematic-working-bodies/detail/water-management-in-the-alps-platform-2009-2019/>

110 https://www.alpconv.org/en/home/convention/protocols-declarations/https://www.alpconv.org/fileadmin/user_upload/Organisation/TWB/Water/Facing_droughts_in_the_Alpine_region.pdf

111 <https://alpine-region.eu/topics-action-groups/cross-cutting-priorities>

112 https://www.alpconv.org/fileadmin/user_upload/Organisation/TWB/Water/Facing_droughts_in_the_Alpine_region.pdf

113 https://www.alpconv.org/fileadmin/user_upload/Organisation/TWB/Water/Facing_droughts_in_the_Alpine_region.pdf

had a significant impact on the Alpine region (especially in 2003, 2015 and 2017). Thus, Alpine drought management has to switch from crisis management to preparedness. There are already several national and regional instruments in place (monitoring and forecasting, see e.g. Alpine drought observatory¹¹⁴). The debate here has mainly two dimensions. First, on the technical level, there are gaps in evaluating drought impacts (missing indicators, databases, monitoring and modelling of drought events and water use). Second, at the pan-Alpine level, there is a need for joint quantification of drought situations (e.g. common rules for thresholds). From the policy perspective, integrated pan-Alpine strategies seem to be most relevant to make different sectors (drinking water supply, agriculture) more resilient against droughts. As concrete measure the literature suggests for example investing in alternative water sources (e.g. rainwater harvesting, wastewater and greywater re-use)¹¹⁵, enhancing planning of water availability or promoting crops diversification to make farming more adaptable to extreme situations.¹¹⁶

As a cross-cutting policy option on integrated water management, the transboundary perspective seems to be the most prominent in recent research and policy briefs. For example, national river basin management plans often lack a transboundary perspective. Thus, an Alpine-wide framework for climate-proofing water management systems and coordinated approaches to deal with droughts and floods seems to be highly relevant.¹¹⁷ In this respect, the cross-border perspective has to be implemented in water(shed) management, tools and methods for drought management, flood risk-management and conservation strategies for Alpine rivers.¹¹⁸ The implementation of the Alpine Climate Target System 2050 plays a key role in achieving this measure, as water is one of the topics covered by this pan-Alpine instrument.¹¹⁹

3.3.4 Sustainable energy solutions

The Alpine debate on energy policy is currently dynamic as illustrated in particular in the 'Renewable Alps vision' of the Alpine Convention.¹²⁰ In general, one might differentiate three main directions:

First, a pan-Alpine knowledge transfer on a more harmonised energy transition is discussed on several levels, both in policy and scientific debates. A prominent example are national mechanisms to further develop renewable energies that differ in Alpine countries. Interreg projects on energy issues can contribute to an Alpine-wide knowledge transfer on energy transition. For example, the Interreg Alpine Space project ALPGRIDS comprised seven pilot projects in Austria, France, Germany, Italy and Slovenia and aims to increase uptake of renewable energy sources in the Alps.¹²¹

Second, the adoption of green and low carbon hydrogen is a widely-discussed policy option, contributing to the REPowerEU strategy. Embedding hydrogen in regional policies and projects in pilot areas supports the development of an Alpine hydrogen sector. Alongside the Alpine value chain (production, storage, transport, distribution and uses for mobility and

114 <https://ado.eurac.edu/>

115 <https://www.eea.europa.eu/publications/water-resources-across-europe/file>

116 https://www.alpconv.org/fileadmin/user_upload/Organisation/TWB/Water/Facing_droughts_in_the_Alpine_region.pdf

117 <https://alpineclimate2050.org/climate-action-plan-2-0/water/>

118 https://www.alpconv.org/fileadmin/user_upload/Organisation/TWB/Water/Facing_droughts_in_the_Alpine_region.pdf

119 https://www.alpconv.org/fileadmin/user_upload/Fotos/Banner/Topics/watermanagement/Report_water_conference_Annecy_EN.pdf

120 https://www.alpconv.org/fileadmin/user_upload/Publications/Towards_Renewable_Alps_2017.pdf

121 https://ec.europa.eu/regional_policy/en/projects/Slovenia/alpgrids-local-grids-for-reliable-renewable-energy-in-the-alps

industries) investments in hydrogen infrastructure are discussed by several studies (e.g. production of fuel cells, electrolysis, hydrogen refueling stations, etc.).¹²²

Decarbonising the transport sector is another important argument. Policy options aim at a modal shift from road to rail and other soft modes and alternative propulsion systems. Several studies imply that the Alpine region lags behind in the use of renewable energy sources in transport and mobility.¹²³

3.4 Policy options from the spatial perspective

3.4.1 Cross-sectoral and cross-border coordination

It is obvious that spatial planning has an important role to play in the implementation of GI. Area protection, just as an example, has to be fixed in regional plans, and land use planning can connect ecological habitats.

In doing so, the cross-sectoral coordination is the main purpose of spatial planning. Understanding and balancing the competing needs is a complex challenge – for example, nature conservation vs. tourism, renewable energy production vs. biodiversity, transport infrastructure vs. ecological networks, etc. Concretely speaking, this requests communicative long-term processes that – finally – result in binding jurisdictional measures. The example of land-take is a currently sensitive topic, as both, soil-protection and affordable housing are important societal needs. Combining these two objectives in municipal planning, in the end, is not easy to reach.

In parallel to the vertical challenge in the multi-level system, the horizontal challenge is cross-border cooperation. Effective measures require collaborative efforts across political boundaries in order to implement protected areas or habitat restoration. For example, when open spaces are not continued across borders, this might disrupt ecological connectivity.¹²⁴

3.4.2 Strategic integration of pan-Alpine objectives

Even if pan-Alpine spatial approaches do not have a mandate for technical planning, they provide strategic orientation (see Fig. 17). For example, the Alpine Convention protocols dealing with green infrastructure provide rather general objectives on the pan-Alpine level (e.g. on mountain forests, energy, and nature protection). The implementation, however, is the task of domestic authorities.

Against this background, it is important to reflect on the integration of general goals from the pan-Alpine level in domestic spatial planning and development. This setting can be illustrated with the example of ecological connectivity. Strategic orientation is provided by large-scale initiatives (such as the EU Green Infrastructure Strategy, the Biodiversity Strategy 2030, the Alpine Convention protocol on mountain forests). At lower institutional levels, the objectives have to be transposed in regional or municipal plans (e.g. with zoning techniques). This process has to combine top-down and bottom-up approaches. In doing so, it has to take into account the

¹²² <https://alpine-region.eu/topics-action-groups/cross-cutting-priorities>

¹²³ <https://alpine-region.eu/topics-action-groups/cross-cutting-priorities>

¹²⁴ <https://doi.org/10.1659/MRD-JOURNAL-D-20-00016.1>

specific spatial contexts and competing needs (e.g. transport infrastructure vs. ecological networks).¹²⁵ This is of particular relevance in the Alpine region with its many borders and diverse territories (see again Fig. 17).

In this situation, it can be helpful to provide spatial differentiation in a visual, cartographic manner – not as binding plans but as illustration and inspiration. A concrete example is the ‘Strategic Alpine Connectivity Areas’.¹²⁶ At the pan-Alpine level, the Alpine Spatial Development Perspective can provide a vision in a spatially differentiated way, on a strategic level and in a cross-sectoral and cross-border manner.

3.5 Towards vision making

The feedback procedure on the topic of Green Infrastructure was a two-step approach. The main participatory element was a written feedback loop. Furthermore, the working group discussed the paper in the framework of an online meeting (February 2024) as an exchange in presence was not possible. A series of editorial changes has already been implemented in the report at hand. The more conceptual feedback is summarised in the following arguments and will enrich the upcoming formulation of an Alpine Spatial Development Perspective:

- Regarding land take, spatial specificities between peri-Alpine lowlands (‘interface territories’) and inner-Alpine mountain areas have to be addressed in more detail.
- The multi-functionality of Green Infrastructure must be taken into account in more detail. GI has social, landscape and economic importance. For example, mountain agriculture with its grasslands is fundamental for biodiversity, but also for tourism.
- The expansion of renewable energy systems in the Alpine region is closely linked to the need to upgrade or build new power lines. This kind of infrastructure often has a cross-border and trans-Alpine dimension and undergoes challenging planning processes.
- Water resources for energy production need to be discussed in the context of droughts and climate change. Other potential conflicts with water use, particularly in the context of hydrogen add complexity to the issue.
- The issue of competing land uses, e.g. for energy production, may lead to the need to define areas for potential and priority uses (cp. the German concepts of ‘Vorrang-’ and ‘Vorbehaltsgebiete’).

This feedback will be taken into account and further addressed as the Alpine Spatial Development Perspective continues to evolve.

125 https://www.bmu.de/fileadmin/Daten_BMU/Pool/Broschueren/alpine_nature_2030_broschuere_en_bf.pdf

126 <https://alparc.org/alpbionet2030>

4 Linking spatial and economic development

4.1 Challenges: Economy in the Alps

4.1.1 Starting position: 'Drop height'

Some of the Alpine economic activities are linked to the territorial specificities of the region: Highly successful sectors include hidden champions in the hydropower sector, in the cableway and outdoor equipment industries and others. The high share of tourism in the summer and winter months is specific to the Alpine region, as is the prominence of the wood and timber sector. Of course, not every development is specific to the Alps, such as the IT sector in many Alpine cities or the financial sector in Ticino. In this context, Alpine economic success is based on a mountain-specific combination of traditional and endogenous potentials that are integrated into the global functioning.¹²⁷

The Alpine region can be described as an – overall – economically strong mountain area that is integrated into the global economy. Fig. 21 shows that the GDP (Gross domestic product) growth in the Alpine region from 2008 to 2018 is significantly above the European average.¹²⁸ It is striking, that the economic growth of recent decades has not been limited to large cities, but also includes small and rural settlements.¹²⁹

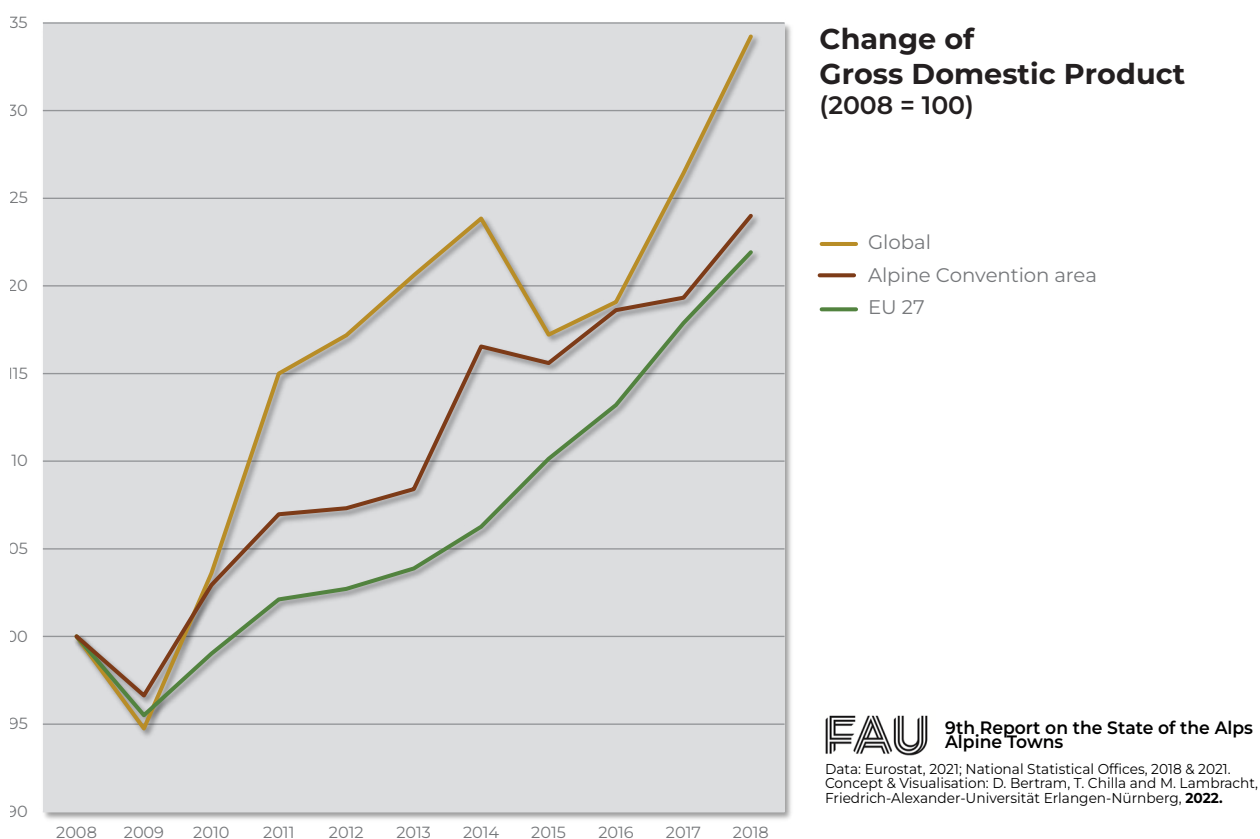


Fig. 21 Gross domestic product change 2008-2018 (RSA9, 2022)

127 <https://alpinetowns.alpconv.org/wp-content/uploads/2022/10/rsa9-part-1-facts-maps-and-scientific-debates.pdf>

128 <https://alpinetowns.alpconv.org/wp-content/uploads/2022/10/rsa9-part-1-facts-maps-and-scientific-debates.pdf>

129 https://bia.unibz.it/esploro/outputs/report/ESPON-Alps-2050-Inception-Report/991005773246201241?institution=39UBZ_INST#file-0

The successful path of the recent years, based on innovation and positive path dependencies, has created a remarkable 'drop height' for future economic development. The role of large companies is also a risk for the region and its employees if they do not adapt to future trends. Even if the Alpine region can be considered as economically strong, it faces massive challenges in terms of topography and transport infrastructure, demographic change, lack of critical mass, and environmental and sustainability issues. Even if the overall development is positive, one must not neglect a high territorial diversity across the Alpine region, including rather weak inner peripheries in several states.¹³⁰

4.1.2 Topographic challenges for infrastructure

The Alpine region shows heterogeneous land use patterns, with dense urban agglomerations along the valleys and depopulation in some remote areas. The limited share of habitable land increases the competition between different demands (such as settlement, transport and tourism infrastructure, energy production, agricultural infrastructure, agricultural production, environmental protection or measures to adapt to climate change), leading to conflicts over land use.¹³¹ This limited availability of land could become a challenge for economic development in the future. Strategic land use planning is essential for sustainable economic development.

Accessibility is also a challenge for sustainable economic development, especially in mountainous regions with their topography. The Alps are an important transit area in the center of Europe.¹³² Transport is creating both, new opportunities and threats for local communities. Freight transport in particular generates high external costs in terms of pollution, noise or congestion. On the other hand, freight transport is essential for the economic development.¹³³ Furthermore, intra-Alpine, regional accessibility is of major importance, as the organisation of services of general interest (schools, retails etc.) largely depend on individual and public transport qualities.

Digitalisation also comes along with infrastructure challenges in the Alps. Fig. 22 shows the download speed in the Alpine region at the local level (2022).¹³⁴ Download speeds vary considerably across the Alps. This exemplary indicator illustrates the scope for improvement in many areas.¹³⁵ The further development of digitalisation is particularly important in terms of economic connectivity, the region's attractiveness for remote working and sustainable development. Digital infrastructure is rarely managed on a cross-border basis but strongly linked to national perimeters, as the map shows. The high number of national borders in the Alps plays a role as barriers to infrastructure provision. However, digitalisation is one of the key prerequisites for a successful economic development. It is highly relevant to avoid the so-called 'digital divide', e.g. extreme differences in the economic, social and spatial dimensions.¹³⁶

130 <https://alpinetowns.alpconv.org/wp-content/uploads/2022/10/rsa9-part-1-facts-maps-and-scientific-debates.pdf>

131 https://www.alpconv.org/fileadmin/user_upload/Organisation/TWB/Soil/Long-term-action-plan_soil-protection.pdf

132 https://aiiries.wikiplus.net/attach.php/6a6f75726e616c5f32372d32656e67/save/0/0/27-2_02.pdf

133 <https://www.sciencedirect.com/science/article/pii/S221053951930135X#s0010>

134 https://www.researchgate.net/publication/375446358_Mapping_the_Scene_Cartographic_sketches_linked_to_the_EUSALP_cross-cutting_priorities?channel=doi&linkId=654a3eeb3fa26f66f4e2650b&showFulltext=true

135 https://www.researchgate.net/publication/375446358_Mapping_the_Scene_Cartographic_sketches_linked_to_the_EUSALP_cross-cutting_priorities?channel=doi&linkId=654a3eeb3fa26f66f4e2650b&showFulltext=true

136 https://link.springer.com/referenceworkentry/10.1007/978-0-387-93996-4_107

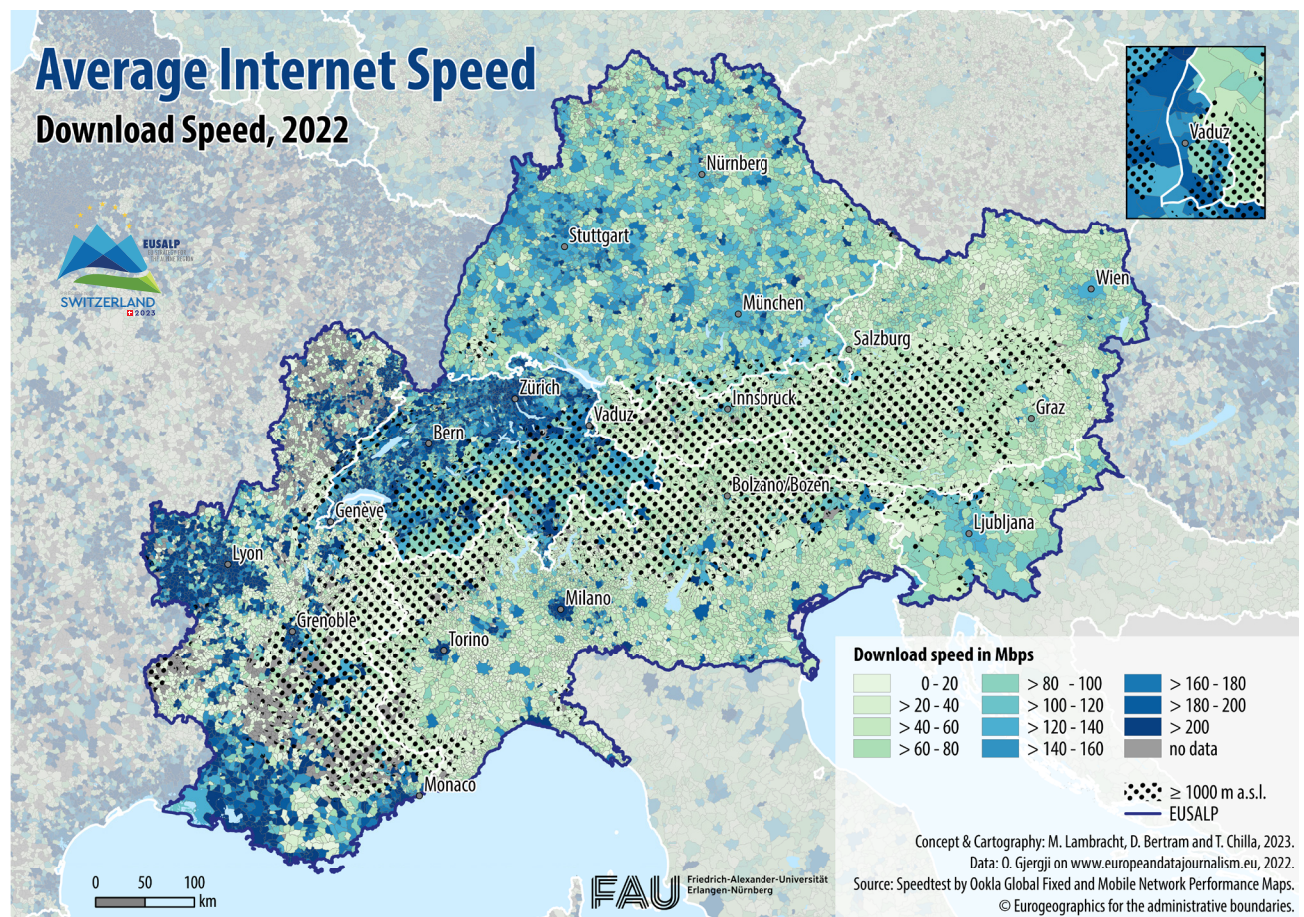


Fig. 22 Average download speed at municipal level (FAU, 2023)

4.1.3 Demographic challenges

The overall demographic trend of the Alpine population is positive, with higher growth rates in most cities and towns than in rural areas (Fig. 23).¹³⁷ Nevertheless, the fine-scale development patterns show a high diversity.¹³⁸ People tend to live in well accessible mountain valleys with access to jobs, education, healthcare and other social services.¹³⁹

However, the demographic change is also a key challenge from the economic perspective. The dynamics of aging create a critical situation for the future, especially when young, highly educated people leave their home towns in search of further education and career opportunities. These highly educated people rarely return to the inner-Alpine areas.

In areas of demographic decline, the number and share of the working population tends to fall, putting pressure on labour markets. In shrinking regions, this comes along with infrastructure challenges as shifting demand and higher costs (demand for medical and elderly care, closure of kindergartens, schools). Studies from several Alpine countries show that the potential of (domestic, Alpine and international) migration is large, especially in communities affected by

137 <https://alpinetowns.alpconv.org/wp-content/uploads/2022/10/rsa9-part-1-facts-maps-and-scientific-debates.pdf>

138 https://www.alpconv.org/fileadmin/user_upload/Publications/RSA/RSA5_EN.pdf

139 <https://www.alpconv.org/en/home/topics/population-and-culture/#:~:text=Only%2015%20years%20ago%2C%20the,healthcare%20and%20other%20social%20services.>

out-migration, skills shortages and ageing populations.¹⁴⁰ The economic performance of the Alps is at stake if regions affected by skills shortages are unable to overcome them.

Amenity migration and remote work can be a large potential in particular for attractive regions. These inhabitants can stabilise regional demand and, to a lower extent, bring entrepreneurial dynamics. This can even apply in the rather critical case of second homes as “multi-local lifestyles can be considered a major opportunity for the Alps if new inhabitants are willing to take responsibility for both regions and their development”.¹⁴¹

Real estate markets are a major determinant for demographic mobility. Adequate and affordable housing capacities can be an important argument for the attractiveness of a region for potential labour force and inhabitants. In highly urbanised regions, the shortages on the real estate market and the high price level can be a bottleneck for economic attractiveness of the involved regions. The demand for housing in rural areas of the Alps must be seen in a differentiated way. Particularly in municipalities with good commuting facilities to cities such as Innsbruck, Munich, Salzburg or Vienna, population increase is widespread.¹⁴² In contrast, areas of depopulation in higher distance to metropolitan cores are often in risk of downward spirals.

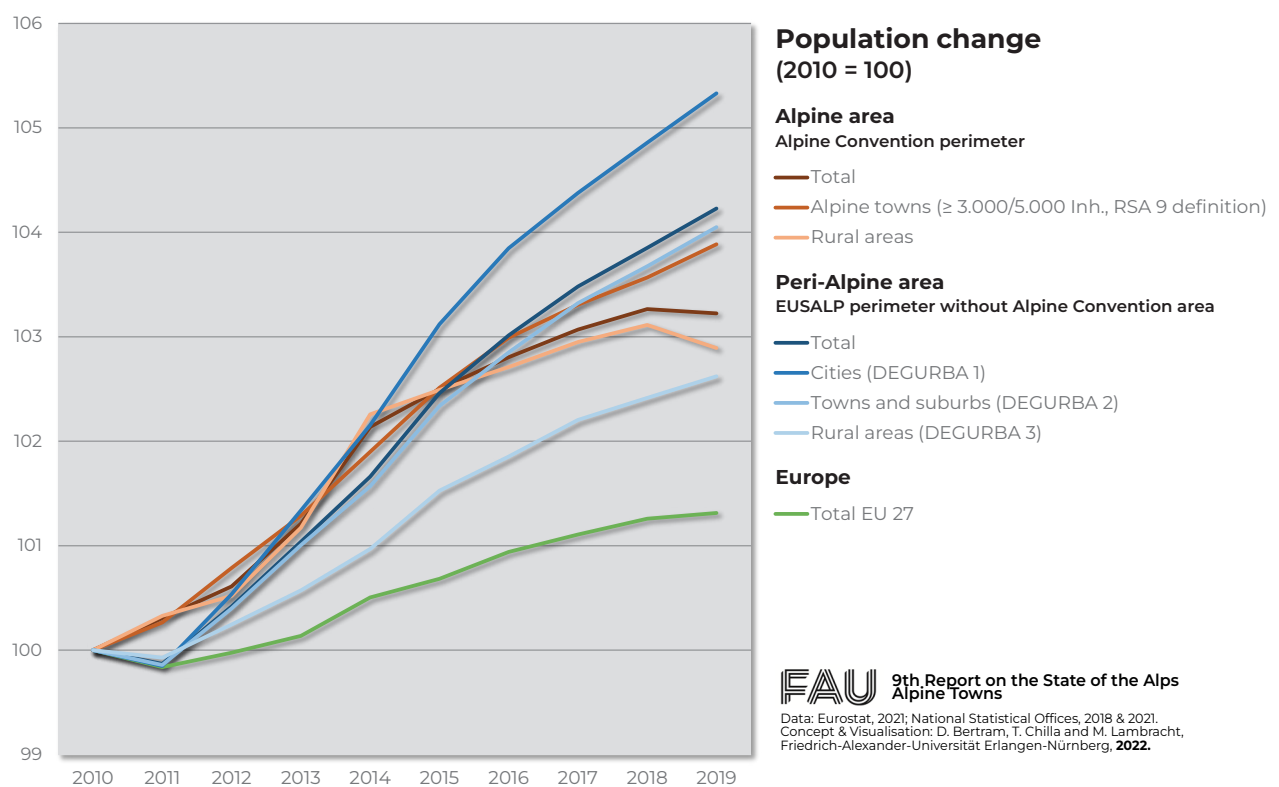


Fig. 23 Population change in 2010-2019 in Alpine and peri-Alpine areas (RSA9, 2022)

140 <https://bioone.org/journals/mountain-research-and-development/volume-38/issue-3/MRD-JOURNAL-D-17-00070.1/Migration-by-Necessity-and-by-Force-to-Mountain-Areas/10.1659/MRD-JOURNAL-D-17-00070.1.full>; <https://bioone.org/journals/mountain-research-and-development/volume-36/issue-4/MRD-JOURNAL-D-16-00042.1/Amenity-Migration-in-the-Alps--Applying-Models-of-Motivations/10.1659/MRD-JOURNAL-D-16-00042.1.full>

141 https://www.researchgate.net/publication/242544321_Zweitwohnungen_im_Alpenraum

142 <https://doi.org/10.4337/9781803927695.00009>

4.1.4 Critical mass

Critical mass is amongst the most Alpine specific challenges. As the Alpine region is of rather rural character with a series of accessibility issues, it is not trivial to develop economies of scale in competition to peri-Alpine metropolitan areas. Regional demand is comparably modest, and interacting on global markets tends to be at least slightly more difficult. Infrastructure costs in the Alpine region are not only higher due to topographic reasons. They also face the critical mass argument, as major investments are more profitable with a high number of potential users.¹⁴³

This is in particular true as big players of the global economy have large opportunities of critical mass and as market complexities (protectionism, price increases due to geopolitical conflicts) can put the Alpine markets under high pressure. On the one hand, specialisation and innovation are an important prerequisite for a competitive economic development in the future. However, a simple 'think big' strategy is insufficient in the context of the region's fine-scale spatial structure.

This is true from an economic point of view, but it also links to a cultural argument: The Alpine identity – with its fine differentiation across the Alpine Arc – is characterised by rather small-scale patterns and often rural contexts. The cultural heritage comes along with creative resources, both tangible and intangible, with a recognised social value. A pure orientation on economies of scale can question these sources.¹⁴⁴ Globalisation brings both opportunities and challenges. On the one hand, it can promote the Alpine region to a wider audience, potentially supporting tourism and economic development. On the other hand, globalisation can lead to cultural homogenisation, where unique local traditions and identities are overshadowed by global trends.¹⁴⁵ With regard to the agricultural sector in the Alps, challenges of critical mass are most obvious. Due to topography, climate conditions, and landscape protection, it is hardly possible to compete on the international market if not referring to particular Alpine qualities.¹⁴⁶

The comparably successful path of recent decades needs to be transferred into future contexts.¹⁴⁷ This has to be based on endogenous development, innovation, and further developing positive path dependencies.

4.1.5 Environmental and sustainability issues

The relevance of climate change is particularly relevant for the Alps due to the pace of temperature rise, but also to changes in the seasonal cycle of precipitation, global radiation, humidity and precipitation extremes.¹⁴⁸ Against this background, a reduction of greenhouse gas emissions is of great importance. There is a huge debate about how to transform the economy in a more sustainable way.¹⁴⁹ A series of fields has to be addressed, including the Alpine production sector and tourism which are important parts of the Alpine economy.

143 <https://alpinetowns.alpconv.org/wp-content/uploads/2022/10/rsa9-part-1-facts-maps-and-scientific-debates.pdf>

144 https://www.interregeurope.eu/sites/default/files/inline/TO6_Policy_Brief_on_Cultural_Heritage_in_Mountain_Regions_04102021.pdf

145 <https://digitalcommons.unl.edu/cgi/viewcontent.cgi?article=1748&context=libphilprac>

146 https://www.alpconv.org/fileadmin/user_upload/Organisation/TWB/MAMF/MAMF_Report_task1_2_ORGANIC_AGRICULTURE_MAMF_2021-2022.pdf

147 <https://alpinetowns.alpconv.org/wp-content/uploads/2022/10/rsa9-part-1-facts-maps-and-scientific-debates.pdf>

148 <https://doi.org/10.1016/j.scitotenv.2013.07.050>

149 <https://www.taylorfrancis.com/chapters/edit/10.4324/9781315800462-3/achieving-sustainability-reform-transformation-william-rees>; <https://www.jstor.org/stable/27283990?seq=3>

The Alpine economy faces sustainability challenges related to energy and resource (water, soil) consumption and waste management. The area is characterised by an energy system that is heavily dependent on fossil fuels and the involved higher CO₂ emissions.¹⁵⁰ The water consumption for agriculture, households, tourism, and production are challenged by drought episodes and a reduction of the amount of stored water and glacier melting. The use of water needs to be managed carefully to prevent conflicts of usage and to keep the water ecosystems functional.¹⁵¹

It is also important to consider the environmental impact of land take and soil sealing for businesses, housing, transport, and production facilities. Regarding soil degradation in the Alpine region, intensively farmed areas are common in wide valleys and on easily accessible slopes. This type of farming has negative impacts due to the use of fertilisers, grading, and drainage. Furthermore, pollution from agricultural runoff and wastewater discharge can degrade water quality, affecting both aquatic ecosystems and human health.¹⁵²

The debate on so-called ecosystem services is closely linked to resource consumption. The Alpine ecosystem provides a wide range of non-monetary services, including fresh water, CO₂ storage, fertile soils, landscape attractiveness etc. There is a rich debate on how to address the monetary value of these functions from an economic perspective.¹⁵³

The transport sector, which is closely linked to economic activities, has an enormous environmental impact. The morphological shape of the highly populated valleys leads to a high concentration of emissions.¹⁵⁴ Moreover, the rising volume of freight and passenger traffic on road and railways results in high noise levels in the narrow Alpine valleys.¹⁵⁵ The growing economic integration across Europe comes along with higher rates of freight transport in the mountain regions, as they are important transit areas between major economic centers.¹⁵⁶ When talking about emissions and noise, it is also important to mention that the landscape quality of the Alps is under threat. Ecological connectivity has increasingly deteriorated due to construction activities related to settlement and transport infrastructure as well as agricultural use.¹⁵⁷

It is true that a series of positive effects come from tourism in the Alps and its overall economic relevance is considerable, also through its function as diversification potentials for small farms. But environmental and societal challenges pressurise the tourism sector in the Alps, sometimes linked to overtourism. The seasonality differs across the Alpine region with winter and/or summer peaks, posing challenges for infrastructural capacities (Fig. 24).¹⁵⁸ A large number of tourists is not always a positive factor. From an economic point of view, it has an important influence on price increases due to growing demand, land conversion for tourism services, or temporal employment.

150 https://www.alpconv.org/fileadmin/user_upload/Publications/RSA/RSA6_en_short.pdf

151 <https://alpineclimate2050.org/climate-target-system/water/>

152 https://wwf.panda.org/discover/knowledge_hub/where_we_work/alps/problems/agriculture/

153 <https://www.sciencedirect.com/science/article/pii/S2212041612000071>; https://link.springer.com/chapter/10.1007/978-3-658-42136-6_87

154 https://www.alpconv.org/fileadmin/user_upload/Organisation/TWB/Transport/Transport_Annex4_IT_Air-quality-sustainable-mobility.pdf

155 https://www.alpconv.org/fileadmin/user_upload/Fotos/Banner/Topics/transport/AlpineConvention_TransportWG_ExternalCostsNoise_112018_web.pdf

156 <https://transport.ec.europa.eu/system/files/2020-07/2020-alpine-traffic-observatory-key-figures-2019.pdf>

157 https://www.bmu.de/fileadmin/Daten_BMU/Pool/Broschueren/alpine_nature_2030_broschuere_en_bf.pdf

158 https://www.alpconv.org/fileadmin/user_upload/Publications/25maps.pdf

From an environmental point of view, it highlights an overuse of natural resources and occupation of natural open spaces. Undoubtedly, tourism needs a sustainable destination management, in particular in sensitive environmental areas.¹⁵⁹

In conclusion, the Alpine economy faces environmental and sustainability challenges, driven by factors such as rising touristic demand, climate change, and resource exploitation. Alpine economies need to develop the capacity to adapt to threats such as water scarcity, heat stress, pressure on carbon-based industries, etc.

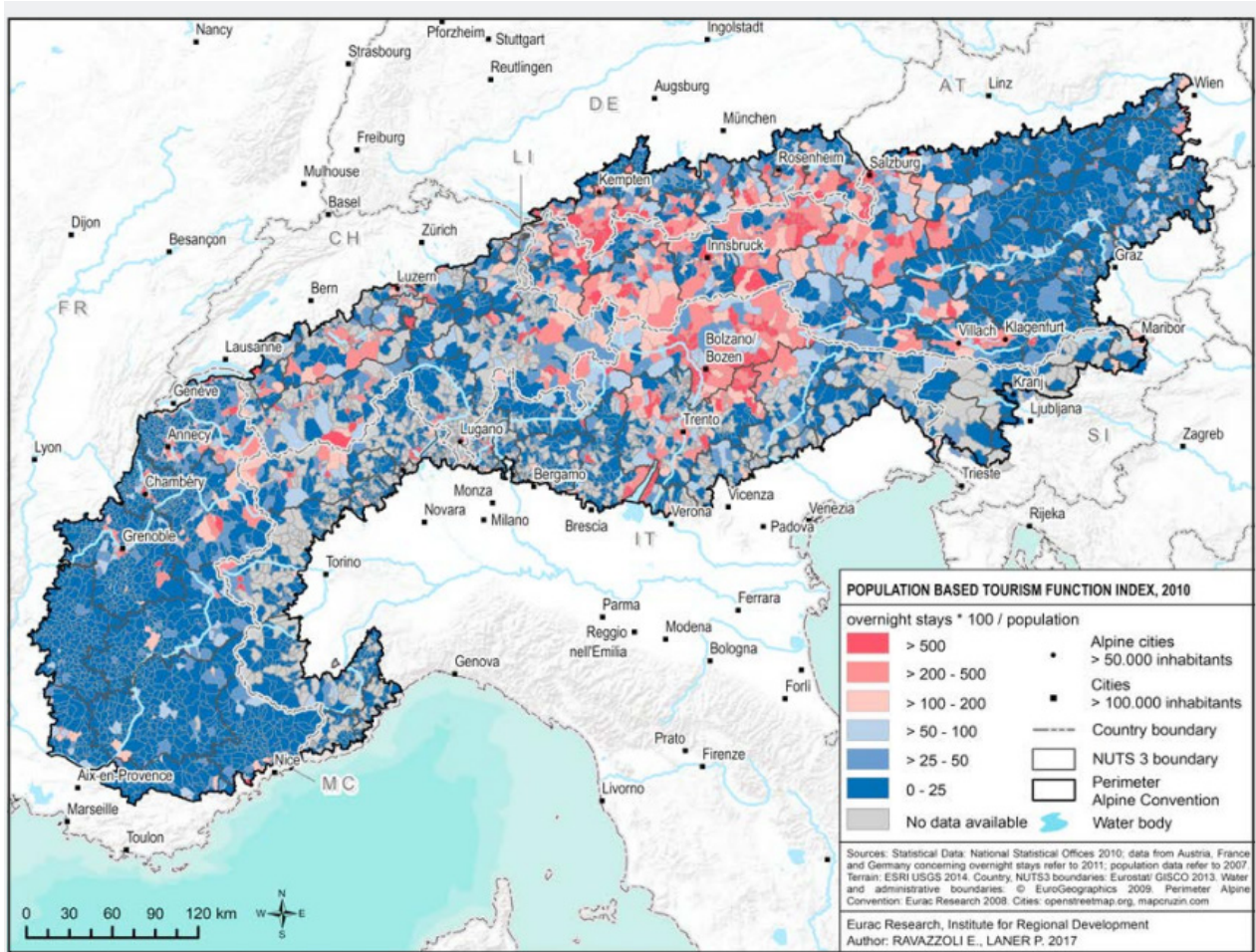


Fig. 24 Population based tourism function index (Eurac Research, 2018)

159 <https://journals.sagepub.com/doi/full/10.1177/1354816620932007>

4.2 The instrumental perspective

In addressing the manifold challenges of the Alpine economy, a series of policy fields and instruments are of high relevance. This includes both, the sectoral options of economic development and the instruments of spatial planning and development. Applying and combining the appropriate tools throughout the multi-level system is an ambitious endeavor, as Fig. 25 shows.

	General	Spatial planning & development	Economic development
European	<ul style="list-style-type: none"> – UN 2030 Agenda for Sustainable Development – European Green Deal – 2030 Climate Target Plan – European Recovery Plan – Green Deal Industrial Plan 	<ul style="list-style-type: none"> – Territorial Agenda 2030 – EU Soil Strategy 2030 – Leipzig-Charter (2007) / New Leipzig-Charter (2020) – Cohesion policy 	<ul style="list-style-type: none"> – European Economic Security Strategy – Circular Economy Action plan – SME Strategy – European Industrial Strategy – Europe 2020 Strategy – Horizon Europe – Research and innovation strategy 2020-2024 – EUs common agricultural policy (CAP)
Pan-Alpine	<ul style="list-style-type: none"> – "Alpine Convention (Framework Convention") – EU Strategy for the Alpine Region (EUSALP) – Climate Action Plan 2.0 – Alpine Climate Target System 2050 	<ul style="list-style-type: none"> – Spatial Planning and Sustainable Development Protocol of the Alpine Convention – EUSALP Joint Paper on Spatial Planning – RSA: Alpine Towns – <i>ESPON Alps 2050*</i> 	<ul style="list-style-type: none"> – Mountain Farming Protocol of the Alpine Convention – RSA 3: Sustainable Rural Development and Innovation – RSA 6: Greening the Economy in the Alpine Region – RSA 10: Quality of Life – <i>Declaration of the XVI Alpine Conference on Fostering a Sustainable Economy in the Alps*</i> – <i>Action Programme for a Green Economy in the Alpine Region (Alpine Convention)*</i> – <i>EUSALP AG1 Research and innovation work plan 2023-2025*</i> – <i>EUSALP AG2 Economic development work plan 2023-2025*</i>
National	<ul style="list-style-type: none"> – [div.] 	<ul style="list-style-type: none"> – National plans, planning concepts and guidelines – <i>CIPRA Handbuch Alpine Raumordnung (AT)*</i> 	<ul style="list-style-type: none"> – e.g. National Circular Economy Strategy DE – e.g. New Regional Policy (NRP) & agricultural policy CH – e.g. Fachkräftestrategie DE – e.g. Agrarumweltprogramm ÖPUL 2023 AT – e.g. International Strategy on Education, Research and Innovation CH
Regional & local	<ul style="list-style-type: none"> – [div.] 	<ul style="list-style-type: none"> – Plans, planning concepts and guidelines 	<ul style="list-style-type: none"> – e.g. Gewerbegebiete, industrial areas. . . – e.g. RIS3 in Bolzano/Bozen – e.g. Agriturismo in the Italian Alps

*non-litigable context documents

Fig. 25 Relevant documents and strategies for the spatial planning and economic development nexus (FAU, 2024)

The columns differentiate three thematic perspectives:

- **'General'** documents include overarching strategies that do not focus on economy or spatial planning/development as such, even if they do have an impact on these fields. As mentioned in **chapter 2.2**, there are several strategic documents with cross-cutting implications at the European level as well as at the pan-Alpine level.
- **Spatial planning and development** strategies and documents are the same as those described in **chapter 2.2**.
- In the field of **economic development**, several documents provide access points. At the EU level, the European Economic Security and the European Employment Strategy have to be mentioned. At the pan-Alpine level, there are several documents, which include on target formulations and vision-making. Pan-Alpine approaches include several declarations of the Alpine Convention (Declaration on Fostering a sustainable economy in the Alps, Declaration Population and Culture of the Alpine Convention). From its early years on, the Alpine Convention has underlined the importance of endogenous potentials. At the national and regional levels, a variety of instruments ensure concrete implementation. A series of strategic documents formulate objectives and strategic pathways play an important role.

Obviously, this compilation is not intended to be complete, but it provides a structured overview on the relevant instruments. The table shows the incremental character of both, the spatial and economy related policies. The collection of different instrumental formats throughout the governance system has grown over decades. The following sections provide some more background information on the current debates on policy options.

4.3 Policy options from the economic perspective

The challenges introduced above are addressed in manifold ways. Simplifying to a certain extent, the measures can be classified into five thematic groups. The following sections go more into detail.

4.3.1 Green and circular economy

A number of approaches seek to achieve a more sustainable economy. In particular, the green and circular economy concepts aim to promote sustainability and address environmental challenges. Whilst both terms are often used in a rather synonymous way, they go back to distinct concepts. Green economy focuses on minimising environmental impacts and resource use without compromising economic growth. Optimising production processes towards sustainability, whilst building on efficiency and innovation are in the focus, in particular regarding energy, transport, industry and agriculture.¹⁶⁰ This can improve human well-being and social equity, which also includes health aspects as environmental conditions affect the quality of life.¹⁶¹ The RSA 6 Greening the Economy in the Alpine Region focused on four key topics regarding green economy: Energy-efficient and low-carbon economy, resource-efficient economy, ecosystem services and a natural capital-based economy and last, economy supporting quality of life and well-being. Within the RSA 6, circular economy was part of resource efficiency.¹⁶²

Circular Economy focuses on redesigning the current linear economic model, which is based on the 'take-make-dispose' principle, into a closed-loop system where resources are kept in use for as long as possible. Circular economy aims to minimise waste generation and maximises resource efficiency by promoting strategies reducing, refuse, reusing, recycling and remanufacturing. These concepts often overlap, with initiatives in one area contributing to the other.¹⁶³ The circular economy is one of the key concepts for achieving a sustainable Alpine economy.¹⁶⁴ The Alpine Convention's Action Programme for a Green Economy postulates a multi-level governance approach. It calls for an energy efficient and low carbon economy, resource efficiency and an ecosystem and natural capital-based production system.¹⁶⁵ Nature-based solutions contribute to a greener and more circular economy. They refer to actions to protect, sustainably manage and restore natural or modified ecosystems that effectively and adaptively address societal challenges while providing benefits to human well-being and biodiversity.¹⁶⁶

160 <https://www.atlantis-press.com/article/125971476.pdf>

161 https://www.alpconv.org/fileadmin/user_upload/Publications/RSA/RSA6_en_short.pdf

162 https://www.alpconv.org/fileadmin/user_upload/Publications/RSA/RSA6_en_long.pdf

163 <https://www.atlantis-press.com/article/125971476.pdf>

164 <https://alpine-region.eu/topics-action-groups/cross-cutting-priorities>

165 https://www.alpconv.org/fileadmin/user_upload/Publications/green-economy-action-programme_2019.pdf

166 <https://www.thebritishacademy.ac.uk/publications/nature-based-solutions-and-the-green-economy/#:~:text=Broadly%20speaking%2C%20nature%2Dbased%20solutions,%2Dbbeing%20and%20biodiversity%20benefits.%E2%80%9D>

Both discussions are rather young and mainly on a conceptual level. Concrete implementation measures remain on a geographical or sectoral context. Nevertheless, they can be seen as cross-cutting postulates for the economic policies in general and also for the following fields.¹⁶⁷

A number of debates beyond the green and circular arguments are questioning the need for growth more fundamentally. The discussion on degrowth (post-growth) argues that the only way to minimise CO₂ emissions, resource consumption etc. is to question economic growth as such. A shrinking economy is supposed to use fewer resources and energy, whilst supporting well-being and ecology.¹⁶⁸ This argumentation is linked to the beyond-GDP-debate that criticises to over-focus on this indicator. GDP does not measure all economic activities (e.g. private family care) and does not express externalities of the environment and the society. When formulating developing goals, a too narrow economic growth orientation is considered to question sustainability objectives. The 'Beyond GDP initiative' aims to develop a more comprehensive approach to measuring prosperity and well-being. Adequate indicators are needed to address global challenges such as climate change, poverty, resource depletion, health and quality of life.¹⁶⁹

4.3.2 Innovation

Innovations are a key to sustainable economic development. Place-based innovation builds on the unique characteristics, resources and needs of a specific geographic area or community.¹⁷⁰ Also, social innovations can help solve local challenges by creating novel ideas for improvement.¹⁷¹ The EU Smart Specialisation Strategy (3S) is amongst the most prominent formats in classical innovation policy. Starting point of smart specialisation strategies are the resources and skills linked to a region. 3S approaches identify and promote the endogenous potential of a region in order to foster an innovative environment. Some regions may not have the appropriate resources to foster innovation. These regions can learn from other places and work together on smart specialisation. In the Alpine area, the 3S-activities facilitated interregional cooperation in policy areas of economic growth and innovation, mobility and connectivity, environment and energy, and the cross-cutting policy area of governance and institutional capacity.¹⁷²

EUSALP, with its Action Group 1 on 'research and innovation', aims to achieve balanced development and connectivity, an effective innovation ecosystem, and enhanced competitiveness through innovative approaches. These include the promotion of research and innovation, development of an effective research, and innovation ecosystem in the Alps and the support small and medium enterprises.¹⁷³ These strategies aim at economic growth and social prosperity.¹⁷⁴

167 <https://link.springer.com/content/pdf/10.1007/s43615-022-00175-9.pdf>

168 <https://www.weforum.org/agenda/2022/06/what-is-degrowth-economics-climate-change/>

169 https://environment.ec.europa.eu/economy-and-finance/alternative-measures-progress-beyond-gdp_en

170 https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&cad=rja&uact=8&ved=2ahUKewicguOL8reGaxWWQfEDHYu1CVs-QFnoECBIQAQ&url=https%3A%2F%2Fpublications.jrc.ec.europa.eu%2Frepository%2Fbitstream%2FJRC120695%2Fplace-based_innovation_eco-systems_comparative_analysis_pdf.pdf&usg=AOvVaw39wq9xAC-4OCwJ0hHa-rQS&opi=89978449

171 <https://bioone.org/journals/mountain-research-and-development/volume-43/issue-1/mrd.2022.00023/Social-Innovations-and-the-Mountain-Economy--The-Case-of-10.1659/mrd.2022.00023.full>

172 <https://s3platform.jrc.ec.europa.eu/alpine-region#fragment-89005-hekg>

173 https://www.alpine-space.eu/wp-content/uploads/2022/12/EUSALP_policybrief_2021_en.pdf

174 <https://alpine-region.eu/about/strategy>

An important focus lies on ‘cross-areas complementarity networks’, which include the establishment of cooperation agreements emphasising specialisation and division of labour.¹⁷⁵ Furthermore, cluster management aims at the strategic coordination of networks, which are geographic concentrations of interconnected companies and institutions in a particular field. These clusters often include businesses, suppliers, academic institutions, and other entities that are thematically linked.¹⁷⁶ A prominent example is Silicon Alps.¹⁷⁷

A more alternative approach reflected on so-called ‘slow innovations’. It refers to the unique characteristics of innovation (potential) in more peripheral regions. This concept is about how innovators in peripheral regions often rely on their technical and scientific knowledge. They typically experience fewer interactions with external actors, such as suppliers or partners, due to geographic location or a lack of established networks. ‘Slow innovators’ strategically seek out information and knowledge, to develop an innovative and stable economic environment.¹⁷⁸

Collaborative innovation approaches – be it ‘slow’ or ‘fast’ – contribute to a more innovative environment. However, these approaches are often handled on a domestic level without exploiting the potential across regional borders.¹⁷⁹

4.3.3 Skilled labour strategies

Tackling the shortage of labour force requires a multi-track approach. One strategic approach aims a reduction of barriers for intra-Alpine labour market migration e.g., to increase information flows. Second, an international recruitment of skilled workers and their integration in the labour market can help to minimise the shortage.¹⁸⁰ Third, the investment in education and training programmes can ensure that the local workforce is prepared for the future needs. For the Alps, an easier recognition of qualifications across borders is an important step.¹⁸¹ Fourth, enhancing the connection between young people and the local Alpine labour markets can limit outmigration to the large metropolises. This can be achieved by raising awareness amongst young people about opportunities available in mountain businesses and traditional occupations.¹⁸²

Alpine destination marketing can also help to attract skilled workers from outer Alpine areas. New formats aim at the combination of remote work and recreation. For example, the project ‘Coworkation Alps’ establishes ‘creative hotspots’ in the Alpine region, supporting the experience and knowledge exchange between professionals and businesses. This can open up opportunities for the regions: new ideas, high skilled workers, creative potential, and inspiration can activate regional development and create an attractive environment. The Alpine region is framed as a place of creativity. It remains to be seen to what extent peripheral areas can exploit their potential and turn their perceived locational disadvantage into a locational advantage.¹⁸³

175 https://re.public.polimi.it/bitstream/11311/1221173/1/2018_Capello%20Cerisola_Economia%20Marche.pdf

176 <https://eujournal.org/index.php/esj/article/view/5138>

177 <https://www.silicon-alps.at/>

178 <https://epub.oeaw.ac.at/0xc1aa5576%200x003b582d.pdf>

179 <https://www.alpine-space.eu/wp-content/uploads/2022/06/s3-4alpclusters-final-publication-interactive.pdf>

180 <https://www.dw.com/en/germany-to-change-immigration-laws-in-attempt-to-attract-skilled-labor/a-65169420>

181 https://www.alpconv.org/fileadmin/user_upload/Organisation/TWB/SPSD/Assessment_study_Cross-border_Cooperation.pdf

182 <https://alpine-region.eu/topics-action-groups/detail/labour-market-education-and-training>

183 <https://www.coworkation-alps.eu/der-verein/vision-mission.html>

4.3.4 Sustainable tourism

A number of strategies and policy options have been developed with the objective of promoting more sustainable forms of tourism in the Alps. Rather soft instruments, such as visitor management and the work of rangers¹⁸⁴, aim to balance recreational activities and nature conversation in the Alpine region.¹⁸⁵ Declarations, incentive programs, stakeholder activation, and consumer communication can help to create a sustainable tourism environment. These instruments are embedded in a juridical framework. The implementation of existing legislation, such as zoning in sensitive areas, can help promote more sustainable tourism practices.¹⁸⁶

From an economic perspective, diversification of the tourism sector has a high potential, in particular in times of climate change. Diversified tourism offerings throughout the year can ensure economic development and a secure source of income and employment. Diversification can minimise the dependence on specific weather conditions as it is the case for skiing and mountaineering. Furthermore, split stays and all-season-offers can increase the flexibility and by that can stabilise the economic basis throughout the year.¹⁸⁷ Mountaineering villages ('Bergsteigerdörfer') are an important tool for balancing tourism and sustainability issues. They aim to increase local added value by focusing on its endogenous potential, without relying on heavy infrastructure and aiming for minimal ecological impact.¹⁸⁸

Tourism development in many Alpine destinations relies significantly on the work force and products of Alpine farmers.¹⁸⁹ In particular the combination of tourism and agriculture has proved to be mutually positive, e.g. agrotourism in Italy.¹⁹⁰ It promotes sustainable tourism and agriculture by fostering a connection between consumers and producers, encouraging environmental stewardship, providing additional income for farmers, and supporting local traditions and biodiversity.¹⁹¹

The collection and dissemination of knowledge and data on sustainability are the basis for the exploitation of the mentioned potentials. Best practice of Alpine tourism solutions can be monitored and disseminated. Alpine tourism destinations can benefit from sharing good practices and data.¹⁹² Sustainable tourism can profit from improved data availability of sustainable tourism indicators. Moreover, cross-border cooperation and stakeholder engagement are seen as an open potential.¹⁹³

4.3.5 Mountain agriculture

Mountain agriculture is a rather small economic sector which is – at the same time – of key relevance for tourism, ecology, landscape conservation, food production etc. Against this background, the protection of geographical origin is a strategy to preserve and support mountain agriculture.¹⁹⁴ These protection schemes and marketing platforms are established at different levels.

184 <https://www.alpinium.bayern.de/bewahren/besucherlenkung/index.html>

185 https://www.naturerlebnis.bayern.de/lenken_gestalten/best_practice/besucherlenkung_alpen/index.html

186 https://www.alpconv.org/fileadmin/user_upload/Publications/RSA/RSA4_EN.pdf

187 https://www.alpconv.org/fileadmin/user_upload/Topics/Measuring_tourism_sustainability_of_mountain_destinations_in_the_Alps_2021_en.pdf

188 https://www.alpconv.org/fileadmin/user_upload/Publications/RSA/RSA4_EN.pdf

189 <https://www.sciencedirect.com/science/article/pii/S2213078021000414>

190 https://www.arl-net.de/system/files/media-shop/pdf/ab/ab_034/ab_034_gesamt.pdf

191 https://www.researchgate.net/publication/343401302_Agritourism_Activity-A_Smart_Chance_for_Mountain_Rural_Environment%27s_Sustainability

192 https://www.alpconv.org/fileadmin/user_upload/Fotos/Banner/Topics/tourism/IV_Report_GP_tourism_FINAL.pdf

193 <https://www.mdpi.com/2071-1050/9/2/226>

194 <https://www.fao.org/faolex/results/details/en/c/LEX-FAOC118307/>

The EU labelling aims to protect specific products to promote their unique characteristics, linked to their geographical origin as well as the underlying traditional heritage. The Geographical Indication allows consumers to recognise quality products, while helping producers to market their products more effectively. The Geographical Indication comprise PDO (protected designation of origin for food and wine) and PGI (protected geographical indication for food and wine).¹⁹⁵ 'Speck of l'Alto Adige/Südtiroler Speck' or 'Vorarlberger mountain cheese' are examples of protected Alpine products.¹⁹⁶ The Geographical Indication is contributed by the EU indication 'mountain product' for agricultural products made in difficult conditions such as mountainous areas.¹⁹⁷ In Switzerland, 'Berg- und Alpprodukte/Montagna e Alpe' is present.¹⁹⁸ Regional labels can also have a protective and marketing purpose, such as Allgäu®¹⁹⁹ and regio-garantie²⁰⁰ (see Fig. 26).²⁰¹ These regional indications are particularly relevant for products that do not have an official PGI or similar formal recognition.

Organic farming and its certification is an opportunity for mountain farmers to qualify their food and products as environmentally friendly and respectful of the environment and its balance. Austria and Italy have significantly higher shares of organic farming than the EU average.²⁰² The small-scale structure of some Alpine farms makes it difficult to overcome the critical mass for certification standards. Group certification seems to be of particular interest for organic mountain farmers whose small economic size does not always justify the costs associated with individual controls and individual mandatory certification. This group certification is one way and is recommended to achieve economies of scale.²⁰³



Fig. 26 Examples of mountain labels

Generally speaking, labelling formats include rather formal certification procedures and general marketing in different combinations. Marketing is a crucial aspect for mountain products and their communication to consumers. Labels can link a product to a certain place via slogans, symbols or narratives etc. The place of origin is framed as a part of a specific product quality.²⁰⁴

195 https://agriculture.ec.europa.eu/farming/geographical-indications-and-quality-schemes/geographical-indications-and-quality-schemes-explained_en

196 https://agriculture.ec.europa.eu/farming/geographical-indications-and-quality-schemes/geographical-indications-food-and-drink_en

197 <https://eur-lex.europa.eu/legal-content/DE/TXT/?uri=CELEX%3A32014R0665>

198 <https://www.blw.admin.ch/blw/it/home/instrumente/kennzeichnung/berg-und-alp.html>

199 <https://b2b.allgaeu.de/marke/markenstrategie>

200 <https://www.schweizerregionalprodukte.ch/de/regio-garantie/>

201 Sources from left to right: <https://b2b.allgaeu.de/marke/markenkommunikation>; <https://www.schweizerregionalprodukte.ch/de/regio-garantie/>; <https://www.clcv.org/infos-sur-vos-produits/produit-de-montagne-et-montagne>; <http://www.trentinoagricoltura.it/Trentino-Agricoltura/Prodotti/Prodotto-di-montagna>

202 <https://www.europarl.europa.eu/topics/en/article/20180404STO00909/the-eu-s-organic-food-market-facts-and-rules-infographic>

203 https://www.alpconv.org/fileadmin/user_upload/Organisation/TWB/MAMF/MAMF_Report_task1_2_ORGANIC_AGRICULTURE_MAMF_2021-2022.pdf

204 <https://www.mdpi.com/2071-1050/15/3/2666>

Given the overarching relevance of mountain farming for landscape preservation, tourism, food production etc, funding and subsidies are a prominent policy options.²⁰⁵ This is particular true for small farms, which are not economically viable. The Common Agricultural Policy (CAP) plays a crucial role in EU mountain areas by providing financial support, promoting sustainable practices and contributing to social cohesion. This EU policy framework helps regions by facing the challenges in maintaining farming activities that can also have a stabilising effect on demography.²⁰⁶ Regional programs like 'Bayerisches Bergbauernprogramm'²⁰⁷ complement each other, and beyond the EU, also the Swiss Agricultural policy provides important instruments.²⁰⁸

Company networking, cooperation and integration are tools to foster Alpine value chains at the business level. The main objective is to enlarge value creation in the region beyond the rather low economic scope of raw materials in agricultural and forestry. Fig. 27 shows the horizontal and vertical dimensions of value creation.²⁰⁹

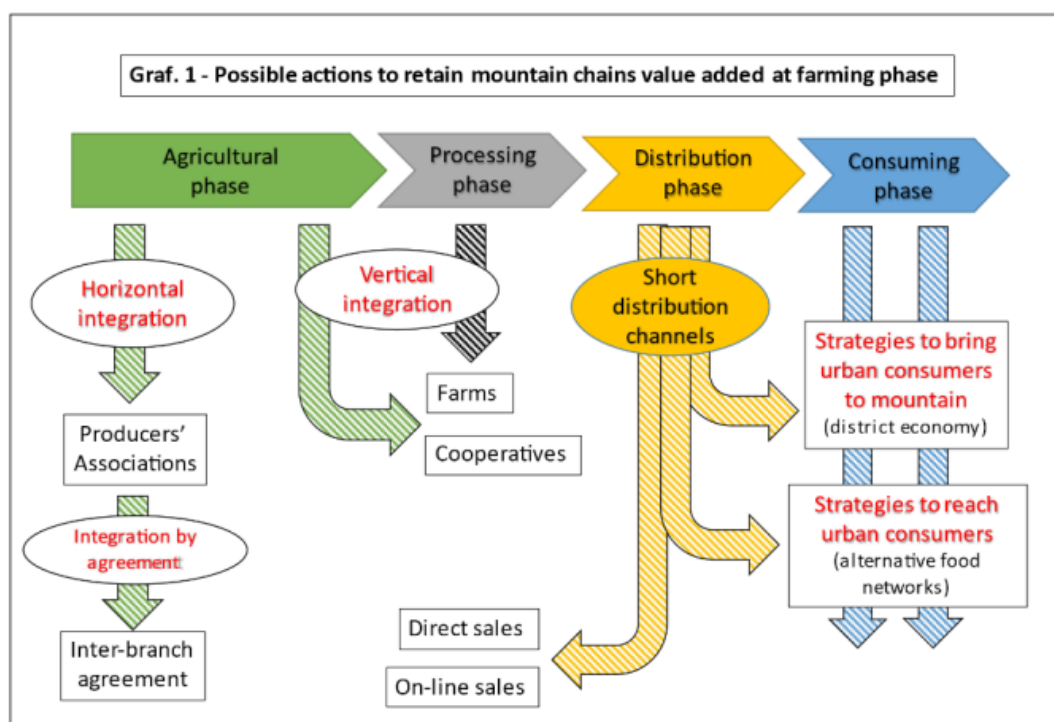


Fig. 27 Possible actions to retain mountain value-added chains at farming phase (Alpine Convention, 2022)

The horizontal dimension refers to the integration of companies at the same level in the value chain to achieve economies of scale. Vertical integration refers to cooperation between companies at different stages of production or distribution. Integration processes strengthen the position of the agricultural and forestry sector. Short distribution channels between producers and consumers can achieve higher margins and can contribute to sustainability with less 'food miles'. Alpine value chains are often promoted at the domestic level, but less at a cross-border scale which could also increase the added value to producers.²¹⁰

205 <https://www.sciencedirect.com/science/article/pii/S2213078021000414>

206 https://eu-cap-network.ec.europa.eu/publications/policy-insight-importance-mountain-development-eu_en

207 <https://www.stmelf.bayern.de/foerderung/bayerisches-bergbauernprogramm-bbp/index.html>

208 <https://www.blw.admin.ch/blw/en/home/politik/agrarpolitik.html>

209 https://www.alpconv.org/fileadmin/user_upload/Organisation/TWB/MAMF/MAMF_Report_task_3_VALUE_CHAINS_MAMF_2021-2022.pdf

210 https://www.alpconv.org/fileadmin/user_upload/Organisation/TWB/MAMF/MAMF_Report_task_3_VALUE_CHAINS_MAMF_2021-2022.pdf

4.3.6 Location factors and policies

The aim of economic policy is to increase or maintain the attractiveness of places for businesses and citizens. In order to ensure or strengthen competitiveness in the long term, a good location policy is needed. This requires well-positioned research and innovation facilities, efficient infrastructure (rail, energy, and transport), a sufficient number of skilled workers and a competitive tax system. Moreover, an effective social system and an efficient public sector play an important role.

There is quite a consensus that locational assets have to be ensured across the different territories. However, it is more controversial to what extent economic policies shall support certain sectors or industries²¹¹, e.g. regarding hydrogen production.

Affordable housing (4.1.3.) has increasingly become a location factor. In some regions, employee housing has been experiencing a comeback in recent years. It offers additional potential and attractive solutions for affordable housing.²¹² In Austria, the 'job with a flat' model is becoming increasingly important as a means of attracting and retaining talent.²¹³

Also, soft location assets play an important role for locational decisions²¹⁴: They are intangible factors that enhance the attractiveness and competitiveness of a place to live, work, and invest. Unlike hard location assets, which include physical infrastructure, soft location assets are more concerned with the cultural environment, social capital and amenity aspects of a location.²¹⁵ The Alpine regions have different strengths and weaknesses, and it is important to build on these assets to ensure sustainable regional development.²¹⁶

4.4 Policy options from the spatial perspective

4.4.1 Land use policy

As indicated in the table above (see Fig. 17), the spatial perspective in economic development differs largely across the multi-level system. At the pan-Alpine level, strategic approaches prevail, whereas the domestic levels are most relevant with regard to binding regulatory frameworks and implementation. This includes land use policy that results in exact spatial prescriptions for types of use – e.g. zoning of protected areas, definition of new housing areas, etc. The policy option of compensation can be done monetarily or by restoring or enhancing other natural areas.²¹⁷

Land use policy is currently a sensitive issue, as both land protection and affordable housing are important societal needs. The Alpine Convention's Spatial Planning and Sustainable Development Protocol underlines "that protection of the environment, social and cultural promotion and economic development of the Alpine territory are all objectives of equal importance, and that therefore it is necessary to find an appropriate, durable balance among them". An important orientation of the objectives for a further spatial perspective is Article 1.²¹⁸

211 <https://www.bmwk.de/Redaktion/DE/Artikel/Industrie/eine-gute-standortpolitik.html>

212 <https://www.gdw.de/pressecenter/pressemitteilungen/bezahlbares-wohnen-wird-zum-standortfaktor/>

213 <https://www.diepresse.com/18473915/das-modell-job-mit-wohnung-gewinnt-an-bedeutung>

214 <https://www.bmaw.gv.at/Themen/Wirtschaftsstandort-Oesterreich/Standortpolitik.html#:~:text=Standortpolitik%20ist%20Teil%20der%20Wirtschaftspolitik,Wettbewerbsf%C3%A4higkeit%20eines%20Wirtschaftsraumes%20zu%20formulieren.>

215 <https://doi.org/10.1080/1331677X.2019.1590217>

216 <https://doi.org/10.1659/MRD-JOURNAL-D-15-00061>

217 <https://www.lfu.bayern.de/natur/kompensationsverordnung/index.htm>

218 https://www.alpconv.org/fileadmin/user_upload/Convention/EN/Protocol_Spatial_Planning_EN.pdf

The role of land use policy is to moderate and balance competing needs 'on the ground'. This necessarily requires communicative, long-term processes that ultimately lead to binding jurisdictional measures. As mentioned earlier, most pan-Alpine documents are non-binding with the exception of the Alpine Convention and its Implementation Protocols (for the ratified contracting parties) as intergovernmental treaty.

Across the multi-level system, a series of documents formulate objectives of minimised or even zero net land take²¹⁹ (EU Soil Strategy 2030 with the aim of 'no net land take by 2050'²²⁰). At the same time, the implementation process is challenging, and the balancing with requests for more residential and commercial space is an ongoing concern. High levels of land take led to concerns of ecological connectivity, protected areas, and open spaces. These issues are politically organised within domestic perimeters even if the functional linkages cross these borders, calling for local, regional and pan-Alpine cooperation across borders.²²¹

4.4.2 Sustainable infrastructure development

Classical infrastructure is of central to economic development, in particular in form of transport, energy, and digital networks. These infrastructure layers are subject to fundamental transition processes and they are key topics of spatial planning and development.

Currently, a pan-Alpine knowledge transfer for a more harmonised energy transition is being discussed. Energy efficiency as an important aspect of decarbonisation reduces greenhouse gas emissions. In public enterprises, energy agencies can improve efficiency through trust-building, information, and technical support.²²² It is suggested that the Alpine region shows an uneven development of hydrogen mobility, with some areas advancing more rapidly than others.²²³ The introduction of green and low-carbon hydrogen as a sustainable energy source is a prominent policy option. Green hydrogen can mitigate CO₂ emissions and foster the transition to low-carbon transport. Decarbonisation of the transport sector is an important issue to promote a more sustainable infrastructure development in spatial planning.²²⁴ Modal shift from road to rail and other soft modes are well-known policy options. Coordinated and harmonised activities in the Alpine countries can contribute to a sustainable transformation in the energy and transport sector.²²⁵

Promoting digitalisation in the Alps is a key policy field for a sustainable economic development. Broadband and satellite infrastructure are the basis for regional and global economic integration.²²⁶ Moreover, digitalisation comes along with huge sustainability potentials, in particular by reducing mobility needs and more efficient production processes. The use of cutting-edge technologies and the promotion of e-services are key elements in achieving a more digital environment.²²⁷ At the same time, geographical and social 'digital divides' have to be avoided, in order to guarantee accessibility to digital infrastructure and solutions for all.²²⁸ It is important to provide support to local communities and economic players in their efforts to become digitally advanced and independent.²²⁹

219 https://www.alpconv.org/fileadmin/user_upload/Organisation/TWB/SPSD/CDR_ACTS_IP_SP1_3_Land_Saving_Targets_Summary.pdf

220 <https://www.eea.europa.eu/en/analysis/indicators/net-land-take-in-cities>

221 https://www.alpine-space.eu/wp-content/uploads/2022/12/EUSALP_policybrief_2021_en.pdf

222 https://ec.europa.eu/regional_policy/en/projects/Slovenia/alpgrids-local-grids-for-reliable-renewable-energy-in-the-alps; https://www.alpine-space.eu/wp-content/uploads/2022/12/EUSALP_policybrief_2021_en.pdf

223 <https://www.alpine-space.eu/wp-content/uploads/2024/03/D.1.6.1-Guidelines-on-how-to-update-and-develop-H2-and-mobility-strategies.pdf>

224 <https://www.alpine-space.eu/project/h2ma/>

225 https://www.alpine-space.eu/wp-content/uploads/2022/12/EUSALP_policybrief_2021_en.pdf

226 <https://www.uni-stuttgart.de/en/university/news/all/6G-mobile-communications-tested-in-the-Alps-for-the-first-time/>

227 <https://alpine-region.eu/topics-action-groups/detail/connectivity-and-accessibility>

228 <https://alpine-region.eu/about/strategy>

229 <https://alpine-region.eu/topics-action-groups/cross-cutting-priorities>

4.4.3 The strategic role of spatial structuring

Economic and spatial development are all closely interlinked. This is particularly true for the spatial organisation of settlement systems.²³⁰ For example, it is important avoid an over dense concentration, which can lead to congestion and overload in the central areas. On the other hand, an overly dispersed organisation leads to inefficiency and unnecessary mobility. The optimal planning principle in this context is decentralised concentration, which allows for efficient links between the main areas of activity. This means defining development and infrastructure corridors, functional links and protected zones. Even if - in practice - planning has to deal with existing structures, it can still influence future development.

Ambitious planning not only anticipates cross-sectoral dynamics, but also formulates strategic objectives and long-term priorities. This applies at all scales - most obviously at the urban and regional level. Furthermore, the transnational scale of the Alpine region is an important layer. Reflecting large scale economic flows, axes and gaps means to further develop the spatial organisation also on the pan-Alpine level. Increased spatial knowledge, intensified exchange and aligned vision making can help to achieve a sustainable and resilient economic development. The Alpine Spatial Development perspective can contribute by further concretising cross-sectoral potentials.

230 <https://alpinetowns.alpconv.org/>

4.5 Policy options from the spatial perspective

As shown, the challenges of economic development and spatial planning and development in the Alps are diverse, as are the guidelines and policy options. The Alpine Spatial Development Perspective will align the different elements towards a common vision, including thematic, geographical and procedural aspects. The feedback loop was organised in the format of an interactive workshop. The Working Group on Spatial Planning and Sustainable Development reflected on this chapter in a joint meeting (July 2024, Innsbruck; see Fig. 28).



Fig. 28 Participative mapping in the workshop of the Alpine Convention working group 'Spatial Planning and Sustainable Development' (Photos: Hannah Paul)

The discussion on the Alpine economy is relatively recent in comparison to the discourses on transport and environmental issues. Given the multifaceted nature of economic development, the workshop participants were requested to develop a legend suitable for economic vision making. They were divided into five groups and engaged in a brainstorming session, during which they develop the following proposals. Fig. 29 illustrates the explorative character of the workshop results.

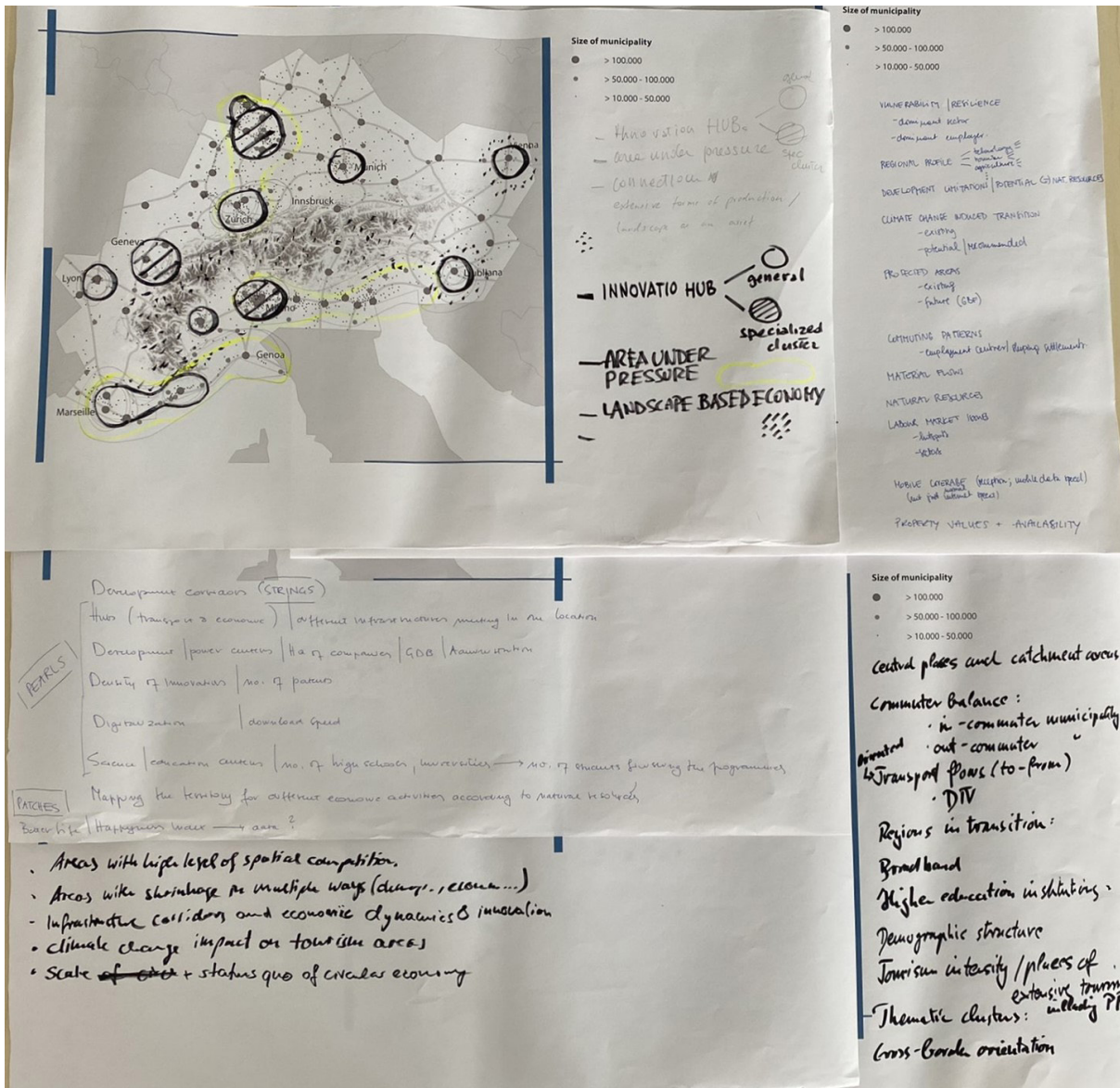


Fig. 29 Results of the participatory legend development (Photos: Hannah Paul)

A map and its legend normally contain lines, points and areas. One workshop group referred to the VASAB logic and defined 'strings', 'pearls' and 'patches', which is the wording of the VASAB vision maps. In relation to lines or 'strings', material or commuting flows were suggested and development/infrastructure corridors were proposed as important patterns for Alpine economy. Hubs were mentioned by different groups, covering a wide range of concentration patterns including businesses, transport, innovation and tourism.

Most proposals argue along thematic lines, which can be grouped under the following headings. Digitalisation, including mobile coverage or broadband availability, is a prominent topic. Sectoral differences and dominant economic sectors are proposed, including technology, agriculture and tourism. Further proposals include:

- Major employers
- Scale and status quo of circular economy
- Landscape based economy
- Tourism intensity (including impact of climate change)
- Regions in transition
- Labourmarket issues (hotspot/sectors)

A socio-economic perspective should include the demographic structure, education levels and information on quality of life. Environmental issues were also part of the discussion with indicators like natural resource availability, the vulnerability/resilience of a region, climate change induced transition and existing and future protected areas. The last thematic group contains so called conflict zones, which include areas under pressure, demographic and economic shrinking areas, areas with development limitations or areas with a high level of spatial competition.

The draft legends and their topics obviously have a large potential to contribute to further Alpine Spatial Development Perspectives. Some of the themes will be explored in greater depth in the next mandate phase.

5 Outlook

This report synthesises the initial phase in the development of spatial development perspectives for the Alpine region. So far, it is necessary to address prominent sectoral issues of the Alpine region's debate. In the coming steps, the sectoral perspectives of transport, GI, and economy have to be completed, and an integrated reflection has to provide a cross-sectoral vision.

The upcoming formulation of the Alpine Spatial Development Perspective (ASDP) will be an incremental process including a broad range of stakeholders and representatives. The mandate phase of the Working Group on Spatial Planning and Sustainable Development for the period 2025-2026 will continue this process.

The ongoing work on the Alpine Spatial Development Perspective will contribute to a deeper analytical understanding and further concretise the spatial dimensions and perspectives. The territorial and sectoral results will provide critical reflections on advancing sustainable spatial development. Spatial visions will be mapped and developed through detailed cartographic representation. The ASDP results aim at broad acceptance after incorporating feedback loops and participatory elements. Additionally, a concretised political process will be established to guide the development of an Alpine Spatial Development Perspective.

The spatial dimension of sustainable development means to promote a cross-sectoral and cross-border approach. This perspective is a key to achieve harmonious sustainable development.



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for Housing, Urban Development
and Building



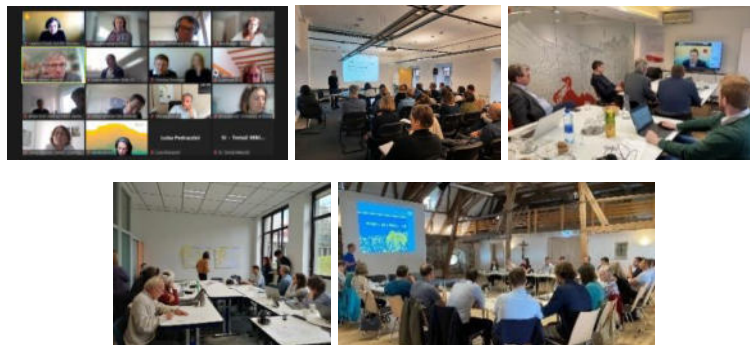
ALPENKONVENTION
CONVENTION ALPINE
ALPSKA KONVENCIJA
CONVENZIONE DELLE ALPI



Friedrich-Alexander-Universität
Erlangen-Nürnberg

Promoting soil protection through spatial planning in the Alpine States

National Workshops



**Joint report of the Working Groups Soil Protection and Spatial
Planning and Sustainable Development of the Alpine Convention**

Mandate 2023-2024

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Introduction

A cooperation on promoting soil protection thorough spatial planning was started and a joint conference was organised during the last mandates of the Working Groups Spatial Planning and Soil Protection. During the current mandate, the topic was concretised and targeted to the relevant level by workshops organised by and within the Alpine States according to specific needs. The two Working Groups prepared the framework, and the chairs of both Working Groups held a joint preparatory workshop on 16 October 2023 online for all national caretakers of this activity. In 2024, four different joint events were organised in Slovenia, Austria, France and Germany. All national events reached the foreseen goals and were evaluated as a fruitful activity, and at least some of them fostered further follow-up activities.

This report gives a brief overview over those four workshops including further information about them in the attachments. The overarching concept for the national workshops and the key messages as well as the documents of the preparatory meeting are available in Annexes 1 and 2.

1. Workshop in Slovenia

Title of the event	Vloga tal v prostorskem načrtovanju (Role of soils in spatial planning)
Date and location	17 January 2024, Ljubljana
Organiser	Ministry of Natural Resources and Spatial Planning; Chamber of Architecture and Spatial Planning
Participants	50; civil servants from related ministries, spatial planners
Short description	The aim was to deepen the knowledge of the legal frameworks of soil treatment in spatial planning processes dictated by the Alpine Convention, EU legislation and the Spatial Development Strategy of Slovenia 2050. Topics: soil ecosystem services, permanently protected agricultural land important for food production, recommendations regarding the treatment of vegetation in the context of green space planning, open spaces in built-up areas and building plots. The discussion among experts was an important step in the process of achieving soil protection goals in which spatial planning can play a key role.
Key messages	<ul style="list-style-type: none">• Soils are often considered primarily as the basis for various activities (agriculture, forestry, settlement, recreation, infrastructure, green spaces, water networks, etc.), even though they are a limited natural resource. Careful land-use planning and land management are a must.• The recommendations regarding the treatment of the unsealed, natural areas in the context of the planning of greens paces, open built-up areas and building plots should be implemented in practice.

- Inclusion of all sectors is needed (also development, not only protection-oriented sectors).

The report in Slovenian and English is available in Annex 3.

2. Workshop in Austria

Title of the event	Coaching event “Raumplanung und Bodenschutz“ (Coaching event “Spatial Planning and Soil Protection”)
Date and location	18 April 2024, online and based in Innsbruck
Organiser	Region of Tyrol, supported by the Permanent Secretariat of the Alpine Convention
Participants	65 morning, 60 afternoon; spatial planners and soil protection experts from administration and from the private sector
Short description	The coaching event focused on strengthening the awareness of the resource soil in view of the increasing depletion of this non-renewable resource. This was done by displaying the background and giving examples of positive tools, strategies, developments and activities in Tyrol. The format of moderation and speakers in Innsbruck but participation online was chosen to enable participants from all of Austria to join.
Key messages	<ul style="list-style-type: none"> • The definition of agricultural provision areas in Tyrol is a powerful instrument. Municipalities want more, not fewer, of such areas. • Unsealing: individual examples add up to an impressive total. Traffic areas and water bodies offer a lot of potential. Private unsealing is also important. Beyond water retention, unsealing heavily affects the quality of life in general. • It is important to define land consumption and soil sealing and to assess it, also focusing on the different usages for which land take happens; a high proportion in Tyrol is sealed for traffic areas. • The methodology of soil function assessment is very appealing and could be a significant contribution for safeguarding high quality soils for the future.

The report in German language is available in Annex 4.

3. Workshop in France

Title of the event	<p>Anticipate changes in Alpine biodiversity: how can planning and development stakeholders define, monitor and evaluate it?</p> <p>Workshop between spatial planning, biodiversity and territorial engineering stakeholders on the scale of the Alps</p>
Date and location	23 May 2024, Grenoble
Organiser	Cerema & ANCT / Commission for planning, development and protection of the alpine massif; financed by the national funds for alpine massif
Participants	Approximately 20 participants coming from environmental associations, local and state spatial planning authorities (alpine SCOT), universities, Vercors and Chartreuse regional natural park, Vanoise national park
Short description	The Workshop focused on biodiversity and spatial planning, including soils, as soil alteration is one of five major causes of biodiversity erosion (Climat & Résilience law). It was a very good cross-sectoral cooperation between biodiversity actors and spatial planners.
Key messages	<ul style="list-style-type: none">• Knowledge and data are complex to acquire and they are poorly defined (compared to other data, for example for housing).• Clearly pose the issues, preliminary requirements, minimum values, a few concrete indicators co-constructed at the scale of the alpine massif.• Create the conditions so that there is appropriation of biodiversity issues by everyone (all stakeholders, all ages...).• Exceptional Alpine biodiversity, climate changing faster than elsewhere, etc. could justify special massif requirements (e.g. lowering the thresholds for impact studies).• To build a shared biodiversity reading grid across the massif and make it known.• Inspiration for the Alpine SCOTs can be gained from the workshop's examples: to go further than the law with a positive biodiversity charter (taken into account upstream, integrated, and not imposed). This should be an evaluation tool and labelling method of positive biodiversity projects.• Drawing inspiration from foreign practices in the Alps such as: Swiss cantonal plans to better articulate planning and management, "functional landscapes" in Germany to identify ideal ecological states.

The program in French is available in Annex 5.

4. Workshop in Germany

Title of the event	Workshop Bodenschutz und Raumplanung (Workshop Soil Protection and Spatial Planning)
Date and location	1-2 July 2024, Benediktbeuern
Organiser	German Federal Ministry for Housing, Urban Development and Building; Bavarian State Ministry of Economic Affairs, Regional Development and Energy, Bavarian State Ministry of the Environment and Consumer Protection, supported by ifuplan Institute for Environmental Planning and Spatial Development GmbH & Co KG
Participants	23 participants from district regional planning authorities (“land-saving managers”), soil protection departments at Bavarian water management offices
Short description	The aim of the workshop was to deepen the knowledge of the dedicated land-saving managers in Bavaria about soil in general, soil quality and tools that can be used for evaluating the value of soils. The land-saving managers are based with the Bavarian district governments as part of the interdepartmental Bavarian land-saving offensive. Connecting them with soil experts from the soil protection department of the water management offices to enable further cooperation on soil quality within the quantitative soil protection approach, was the main goal. The cooperation and understanding of soils were further deepened during a field excursion.
Key messages	<ul style="list-style-type: none">• Interdisciplinary exchange and joint efforts on the topic of soil quality and quantity is important and beneficial.• Soil is more complex than often perceived.• Soil protection and nature protection often go hand in hand, but not always. Thus, a case-by-case assessment is always necessary.• Ground-mounted photovoltaic systems are currently a big factor in the land take statistics in Bavaria. They usually have negative impacts on soil. Guidelines on mounting PV systems in a soil compatible way need to be followed.

The full report in German and English language available in Annex 6.

ANNEX 1: Concept for national workshops and key messages for caretaker tandems

Promoting soil protection through spatial planning in Alpine States

Concept for national workshops

Background

In the previous mandate, the Working Groups Spatial Planning and Soil Protection organised a joint Alpine-wide workshop in Munich to facilitate an exchange of experts and practitioners in soil protection and spatial planning and to promote soil protection through spatial planning in the Alps.

In order to concretise a closer cooperation and improve mutual understanding between soil and planning experts, respective events at national level were deemed necessary in order to appropriately address country- and regionally specific issues and legal/structural framework conditions and to reach experts and stakeholders at the regional and local level.

Topic

Spatial planning addresses soil protection through (a) the establishment of priority zones and their spatial representation in maps as basis for decision making and (b) through the weighing of interests and objects of protection in individual spatial planning decisions. The events need to focus on issues that experts and stakeholders in the respective Alpine country are currently confronted with in the interface between soil protection and spatial planning. If relevant for the chosen topic and to showcase the benefit of an Alpine-wide perspective, experiences and lessons-learnt from other Alpine countries should be used as a thematic input¹.

Consequently, this concept provides merely an umbrella under which the orientation of each country's national event needs to be specified. This specification is the responsibility of a caretaker tandem, composed by one national representative from the Spatial Planning and the Soil Protection Working Group each. Additionally, a feedback loop on the thematic orientation should be organised with 1-2 experienced practitioners from the respective country or federal state to ensure relevance and thus attendance.

Target group

The event addresses primarily planning practitioners at the regional and local level of the respective Alpine country. Secondly, the target group of political decision-makers should be involved.

¹ E.g. experiences and lessons-learnt in the implementation of the Agricultural Priority Zones in Tyrol as an input for the upcoming amendment of Bavarian regional plans with agricultural priority zones.

Organisational issues

National delegations are responsible for planning, organising and implementing the events, to be held in the national language(s). They can choose between an online-format (potentially higher attendance, lower costs) and a physical event (significantly better personal exchanges and more detailed discussions). In case of shorter travel distances (e.g. German or Slovenian Alps), in-person events would be preferred. The format also defines the length of the event (online 3 h, on-site can be longer). In the preparation of the workshop, relevant national and regional institutions should be involved (Planning Associations, Chamber of Architects, Thematic Networks etc.). Integrating the workshops into an already existing format or planning it back-to-back to an existing event/series of events is recommended to guarantee a good attendance.

The events are envisaged for the last quarter 2023 or the first half of 2024.

Next steps

- Discussion and finalisation of concept by the Soil Protection and Spatial Planning Working Groups and specifically the caretakers for the Implementation Pathways Soil and Spatial Planning (members of the WGs) by the end of March
- Designation of caretakers for the national implementation
- Draft of national concepts (including feedback loop with national/regional expert(s)) by the national caretakers
- Organisation of national events (financing, invitation, venue) by the national caretakers
- Outlook: in a further step, the target group of political decision-makers is to be involved (2024)

February 16th, 2023

Promoting soil protection through spatial planning in Alpine States - national workshops

Key messages for caretaker tandems

Closer cooperation and mutual understanding between soil and spatial planning experts is essential according to preceding events and discussions in both fields. It was called for events in the Alpine countries in the respective national languages as an exchange platform to appropriately address country- and regional specific issues and legal/structural framework conditions and to reach experts and stakeholders at the regional and local level.

It is a highly relevant task for national soil conservation and spatial planning experts to organize and participate in the coaching events:

- Reaching the respective land take goals is a challenge in all Alpine countries. International and interdisciplinary exchange can help.
- Spatial planning plays a key role in the implementation of soil conservation goals. At the same time, integrating soil conservation in spatial planning processes requires a closer cooperation and mutual understanding between these spheres.
- Soil is a limited resource that can only be renewed over decades.
- High quality soils are essential for human existence, e.g. for food production and many more valuable services.
- Soils are subject to natural hazards such as erosion by wind and water, landslides, salinization, etc., but an important part of losing high quality soils is controlled by human activities such as land take, soil sealing, loss of organic matter, pollution from various sources.

Added value of the coaching events

- Learning from neighbouring regions/countries and sharing of lessons-learnt and how to address common challenges.
- Presentation of good practice instruments.
- Providing a platform for exchange between experts and practitioners of soil protection and spatial planning at various spatial levels.
- Topics from the local and regional levels should be taken up, discussed and possible solutions found.
- Current relevant EU legislation and regulations should be presented, e.g. EU Soil Health Law, EU Mission "A Soil Deal for Europe", EU Nature Restoration Targets.
- Space for discussions between experts.
- Flagging that such activities support the implementation of the Alpine Convention.
- Qualifying efforts to reduce land take with aspects of qualitative soil protection through capacity building.

ANNEX 2: Preparatory workshop 16 October 2023: Memo, content input, logistics input

Preparatory workshop: Soil Protection/Spatial Planning tandems for national workshops

16 October 2023, online

Short memo

The national workshops aim at promoting soil protection through spatial planning in the Alpine states. The objectives of this preparatory workshop were:

- to introduce the scope in which the national/regional/local workshops on soil protection in spatial planning are intended to take place,
- to bringing colleagues from soil protection and from the spatial planning together who will implement the workshops,
- to facilitate the exchange and to share ideas between the countries.

The content and logistical scope was presented during the preparatory workshop and are provided as documents. Various important content aspects were discussed. This memo shortly summarizes the current state of planning in the Alpine countries, who were present.

Austria

A one-day event is planned for March/April 2024 including the following experts and topics: Maria Hutter: agricultural priority areas, Hermann Öggel: terminology soil consumption, soil sealing, monitoring within the webGIS TiRIS, impacts of soil consumption and zoning, Clemens Enthofer: unsealing.

France

In cooperation with the French Committee de Massif des Alpes a cross sectoral workshop is planned for the first half of 2024 probably in Grenoble. The workshop will have three different focus parts:

- General knowledge of the topic,
- Soil preservation in spatial planning documents, land sobriety,
- Soil restoration and renaturation.

Germany

The planning of the activity has just started. It could take place in connection to the Bavarian land saving initiative. Interest in the activity as well as the possibility for support from the Federal side was expressed.

Italy

The ideas are currently in an early stage and have to be discussed with the ministry before they can be communicated.

Liechtenstein

Liechtenstein is interested to hold a workshop on approaches how to incorporate soil aspects into spatial planning. Liechtenstein has a good soil quality database. Liechtenstein will exchange about possibilities and input for a workshop with the colleagues from Tyrol.

Slovenia

Originally a combination with the event in celebration of World Soil Day 2023 was intended. But it was further advanced into a workshop for soil experts in January 2024. Successful activities in this regard should be presented. It will be combined with a format that is already taking place. It is intended but not fixed yet to organise further workshops for spatial planning experts and for decision makers.

In addition, also the Contracting Parties who were not able to attend the preparatory workshop are invited to join the activities according to their possibilities.



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Policy background: Soil protection and spatial planning

October 16 2023

Florian Lintzmeyer (ifuplan)



Soil protection and spatial planning

- Quantitative land-saving targets are well established (yet insufficiently successful) elements of spatial development strategies
- Soil has long been lacking a legal standing under European Law, unlike air, water and marine environments
- Challenge to transfer qualitative soil protection to planning practices
- Limited arable land makes soil protection particularly relevant in the Alps

Soil functions and spatial planning in the Alps

Munich, 29-30 March 2022

Workshop documentation



© Land Trol/Thomas Peham

**Spatial Planning and Sustainable Development and
Soil Protection Working Groups of the Alpine Convention**

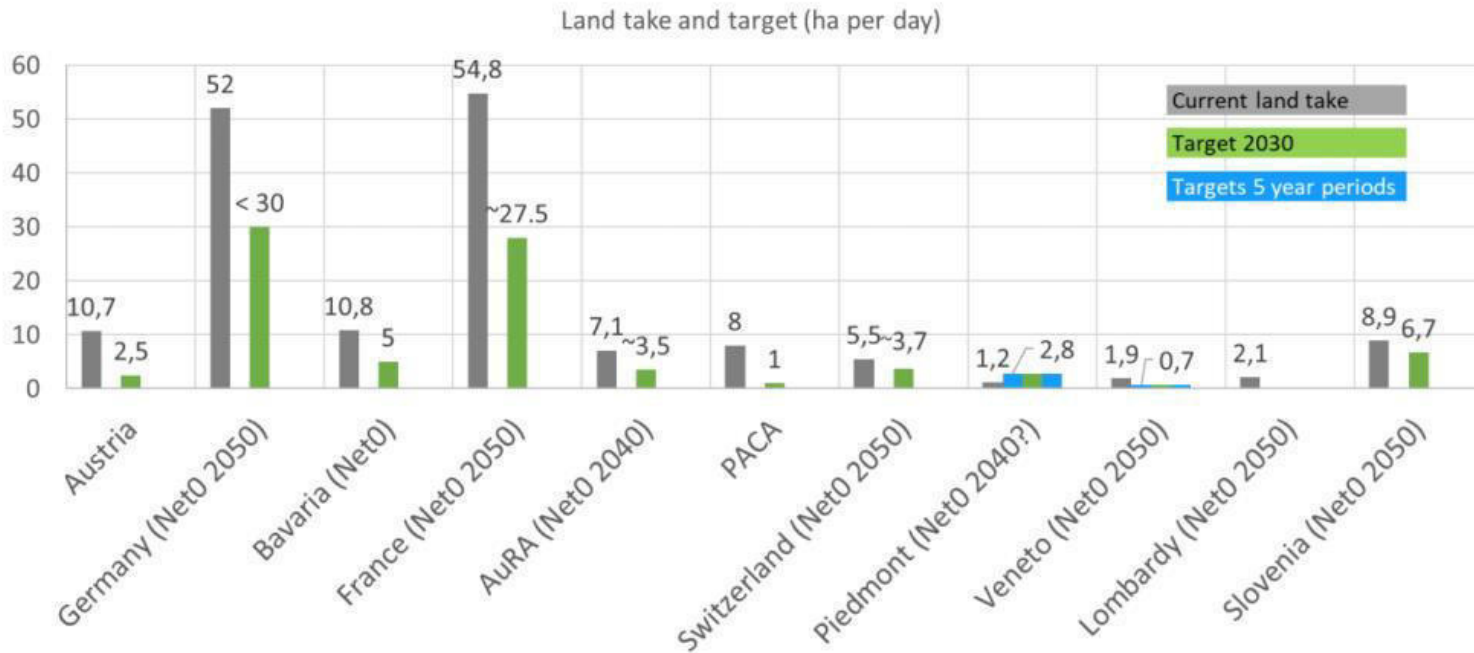


The need for better soil protection

- 60% of European soils are unhealthy
- Ongoing degradation due to unsustainable land management, sealing (annual EU-wide net land take of 500 km²), contamination and overexploitation, combined with the impact from climate change and extreme weather events.
- ➔ Degraded soils reduce the provision of ecosystem services (food, feed, fibre, timber, nutrient cycling, carbon sequestration, pest control or water regulation)
- ➔ Loss of these ecosystem services costs the EU at least 50 billion € per year (= equivalent of annual agricultural direct payments and rural development funds for the entire EU)



Current land take and targets



Current land take (AT, FR, IT, AuRA, PACA, Bavaria, Lombardy, Piedmont, Veneto: 2020, DE: 2019, CH: 2018 SI: 2012) and land saving targets in the Alps



EU Soil Legislation

Directive on Soil Monitoring and Resilience (adopted in 7/2023) / “Soil Monitoring Law” (pending)

- Sustainable soil management set to become the norm in the EU
- Member States will have to define positive and negative practices of soil management.
- Regeneration measures to bring degraded soils back to a healthy condition need to be defined and implemented, based on Member States' soil health assessments.

EU Soil Strategy for 2030

- Framework and concrete measures to protect and restore soils. It sets a vision and objectives to achieve healthy soils by 2050, with concrete actions by 2030
- Circular land use by 2050 (land take hierarchy: avoid, reuse, minimise, compensate)
- By 2023, member states set ambitious national, regional and local reduction targets and report on progress

EU Mission „A soil deal for Europe“

- Research and innovation supporting the implementation of the strategy



Spatial Planning Framework on land take and soil functions (e.g.)

Territorial Agenda 2030 and key European objectives

- **Why we need to act**“ includes land consumption (land take, soil sealing, soil quality)
- **A just Europe**→ Functional regions: Avoiding urban sprawl and reducing land take
- **A green Europe**→ Circular economy, taking into account sustainable soil and land

^{use}
Legislative framework at national and federal state levels (e.g. German Federal Spatial Planning Law)

- Natural assets are to be used sparingly
- Reduction of land take and quantified reduction requirements
- Densification and brownfield development
- Compensation for impairments of the natural balance



Alpine Convention Implementation Protocols

Soil Conservation, e.g.

- Economical and prudent use of soils (Art. 7):
 - Consideration when drafting plans and/or programmes
 - Contracting Parties provide for space-saving construction and economical use of soil resources (including settlement growth boundaries)
 - Soil conservation in EIA for large-scale projects
 - Restoration/recultivation of impaired soils and derelict land (brownfield recycling)

Spatial Planning and Sustainable Development, e.g.

- Reserving land for agriculture, forestry and pasture (Art. 9(2))
- Contained delimiting of areas for urbanisation (Art. 9(3))



Key messages

- While being acknowledged in principle, soil functions and site-specific soil qualities usually play no discernible role in spatial decision making
- Medium- and long-term reduction targets and circular land use represent a shift of planning paradigms in the near- and mid-term future ⇒ many questions still unanswered
- Reaching reduction and soil protection targets requires a concerted, interdisciplinary effort





Issues at the interface between soil protection and spatial planning in the Alpine Convention area

- Close implementation gap → operationalising soil functions for decision-making processes
- Operationalising desealing and restoration of soil functions
- Ensure coherent planning approach and expertise horizontally and vertically
- Illustrate multiple and mutual benefits between soil protection and spatial planning
- Resolve dilemma (and challenge):
 - cumulative effects
 - connections between local losses and global effects
- ...



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Permanent Secretariat of the Alpine Convention
Herzog-Friedrich-Str. 15, A – 6020 Innsbruck

alpconv.org



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Preparing national workshops:
Promoting soil protection through
spatial planning in the Alpine
States

16 October 2023 - Online

alpconv.org

Target groups

- ✓ Spatial planning experts and practitioners
- ✓ Soil protection experts and practitioners
- ✓ Decision makers
- Cooperation should be fostered between Soil Protection and Spatial Planners in the national regional local context.



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Photo: LANAT Berne & Agroscope; agence UMSICHT IYS2015

Possible settings

As it suits best in your case!

- Ideally in the context of events that are already taking place (e. g. seminar series)
- Ideally where the biggest impact can be reached
- In person or online
- 2 hours, half day or full day





Possible programme

Example agenda for such a workshop in presence

09:45	Coffee & tea
10:00	Setting the scene: Why this Workshop, who is part of it
10:30	Impulse presentation of the issue and solutions
11:00	Work in small groups
11:45	Reporting back to joint group about solutions found and future collaboration ideas (e.g., between spatial planning and soil protection)
12:00	Simple joint lunch with seasonal products from good soils in the region
12:45	Other impulse indoors or outdoors (showing the need & solutions)
14:00	Room for discussions
14:45	Conclusion and possible future steps



Example agenda for such a workshop online

10:00	Setting the scene: Why this Workshop, who is there
10:30	Impulse presentation of the issue and solutions
11:00	Work in small groups
11:30	Reporting back to joint group about solutions found and future collaboration ideas (e.g. between spatial planning and soil protection)
12:00	Conclusion and possible future steps

Timeframe

As it suits best in your case!

- Ideal: between now and August 2024
 - Documentation of the workshops should be ready before 13 September 2024
 - **XVIII Alpine Conference: 22 January 2025**
- Ideally times that fit into the context of events that are already taking place (e. g. seminar series)
- If outdoor part is envisaged, it should take place in summer (not obligatory)





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**Thank you for the
attention!**



ANNEX 3: Report national event in Slovenia: “Vloga tal v prostorskem načrtovanju”, Ljubljana on 17 January 2024

Vloga tal v prostorskem načrtovanju

- izobraževanje za prostorske načrtovalce -

Zbornica za arhitekturo in prostor Slovenije (ZAPS), 17. januar 2024

Tla so naravni vir, ki ga v prostorskem načrtovanju pogosto obravnavamo predvsem kot osnovo za različne dejavnosti, kmetijstvo, gozdarstvo, poselitev, rekreacijo, ter povezovalne strukture, infrastrukturo, zelene površine, vodne mreže ipd. Po drugi strani pa tla nimajo enakih značilnosti, so zelo raznolika, od česar je odvisna tako njihova primernost za različne rabe kot tudi ranljivost, bodisi zaradi naravnih ali antropogenih vplivov. Zaradi dolgotrajnih procesov nastajanja ali obnavljanja, ki trajajo nekaj človeških generacij, tla obravnavamo kot omejen naravni vir, kar zahteva skrbno načrtovanje rabe tal in gospodarjenje s tlemi. Ob vse bolj izrazitih učinkih podnebnih sprememb pa spoznavamo tudi vlogo tal za blaženje podnebnih sprememb ter prilagajanje nanje. Še zlasti je pomembna vloga t.i. raščeni tal oziroma raščenege terena na poselitvenih območjih, tako za zmanjševanje toplotnih otokov kot tudi za naravno ponikanje padavinskih voda.

Izobraževanje je bilo namenjeno poglobljanju znanja o pravnih okvirih obravnave tal v procesih prostorskega načrtovanja, ki jih narekujejo Alpska konvencija, EU zakonodaja v pripravi in sprejeta Strategija prostorskega razvoja Slovenije 2050, o ekosistemskih storitev tal, strokovnih podlagah o trajno varovanih kmetijskih zemljiščih, pomembnih za pridelavo hrane, ter priporočilih državnega prostorskega reda glede obravnave raščenege terena v okviru načrtovanja zelenih površin, odprtih grajenih površin ter gradbene parcele.

Izobraževanje je bilo organizirano kot priložnost za razpravo med strokovnjaki in predstavlja pomemben korak v procesu doseganja ciljev varstva tal. Prostorsko načrtovanje pri tem lahko igra ključno vlogo.

Na dogodku je bila po predstavitvi splošnega in strateškega okvira za upravljanje s tlemi posebna pozornost namenjena ekosistemskim storitvam tal. Predstavljeni so bili poudarki iz Strategije prostorskega razvoja Slovenije do leta 2050 in strokovne podlage s področja kmetijskih zemljišč za določitev trajno varovanih kmetijskih zemljišč.

Po odmoru so bila predstavljena priporočila Državnega prostorskega reda glede ravnanja z naravnim/nepozidanim terenom v okviru načrtovanja zelenih površin, odprtih prostorov na pozidanih območjih in gradbenih parcel.

Dogodka se je udeležilo 50 udeležencev, sodelavcev pristojnih ministrstev in prostorskih načrtovalcev, ki obe temi obravnavajo v svojih rednih delovnih procesih. Postavljena so bila številna operativna vprašanja, ki so samo potrdila odločitev, da so takšna usposabljanja potrebna in koristna.

Izobraževanje je bilo vključeno v letni program stalnega poklicnega izobraževanja ZAPS, udeleženci so z udeležbo pridobili kreditne točke v okviru programa.

[Prispevki](#)



Program izobraževanja o vlogi tal v prostorskem načrtovanju

9.00	Prihod, registracija	
9.30	Uvodni pozdrav	mag. Lenča Humerca Šolar, Ministrstvo za naravne vire in prostor Veronika Ščetinin, ZAPS Izobraževanje
9.35	Splošni in strateški okviri obravnave tal Alpska konvencija in protokoli; ZUreP-3) EU – Zakon o varstvu tal, Slovensko partnerstvo za tla	<i>Blanka Bartol</i> Ministrstvo za naravne vire in prostor <i>dr. Petra Karo Bešter</i> , Ministrstvo za okolje, podnebje in energijo
10.00 – 10.45	Ekosistemske storitve tal	<i>dr. Borut Vrščaj</i> , Kmetijski inštitut Slovenije
10.45–10.50	Vprašanja in odgovori	
10.50–12.00	Strategija prostorskega razvoja Slovenije 2050, strokovne podlage za načrtovanje	<i>Blanka Bartol, Simona Peršak Cvar</i> Ministrstvo za naravne vire in prostor
	Strokovne podlage s področja kmetijskih zemljišč za določitev trajno varovanih kmetijskih zemljišč	<i>Leon Ravnikar</i> , Ministrstvo za kmetijstvo, gozdarstvo in prehrano
	Presoja vplivov plana na okolje - tla	<i>dr. Petra Karo Bešter</i> , Ministrstvo za okolje, podnebje in energijo (TBC)
12.00–12.10	Vprašanja in odgovori	
12.10–13.00	Odmor za kosilo	
13.00–14.30	Priporočila za obravnavo tal / raščenege terena v okviru načrtovanja naselij - Zeleni sistemi mest in naselij – priročnik - Javne odprte grajene površine - Priročnik za načrtovanje in organizacijo gradbene parcele	<i>dr. Jernej Červek</i> , Ministrstvo za naravne vire in prostor
14.30-15.00	Vprašanja, odgovori, izkušnje iz prakse, razprava	
15.00	Zaključek izobraževanja	

Dogodek povezuje in moderira mag. Lenča Humerca Šolar.

The role of soil in spatial planning

- Training for spatial planners -

Chamber of Architecture and Spatial Planning of Slovenia (ZAPS), 17 January 2024

Soil is a natural resource that is often considered in spatial planning primarily as a basis for various activities, agriculture, forestry, human settlement, recreation, connective structures, infrastructure, green spaces, water networks, etc. On the other hand, soils do not all have the same characteristics and are very diverse, which determines both their suitability for different uses and their vulnerability, whether due to natural or anthropogenic influences. Due to the long processes of formation or regeneration, which take several human generations, soil is considered a limited natural resource, which requires careful land use planning and management. As the impacts of climate change become more pronounced, the role of soils in mitigating and adapting to climate change is also being recognised. In particular, the role of 'vegetated soils' or 'vegetated terrain' in built-up areas is important, both for reducing heat islands and for the natural infiltration of rainwater.

The aim of the training was to deepen the knowledge of the legal frameworks of soil treatment in spatial planning processes dictated by the Alpine Convention, EU legislation in preparation and the adopted Spatial Development Strategy of Slovenia 2050, on soil ecosystem services, expert bases on permanently protected agricultural land important for food production, and recommendations of the national spatial order regarding the treatment of vegetation in the context of green space planning, open spaces in built-up areas and building plots.

The training was organized as an opportunity for discussion among experts and is an important step in the process of efforts to achieve soil protection goals. Spatial planning can play a key role in this.

At the event, after the presentation of the general and strategic framework for soil treatment, special attention was given to soil ecosystem services. Highlights from the Spatial Development Strategy of Slovenia until 2050 and expert bases in the field of agricultural land for the determination of permanently protected agricultural land were presented.

After the break, the recommendations of the National Spatial Order regarding the treatment of the natural/unsealed terrain in the context of the planning of green spaces, open spaces in built-up areas and building plots were presented.

The event was attended by 50 participants, colleagues from the relevant ministries and spatial planners, who deal with both topics in their regular work processes. A number of operational questions were raised, which only confirmed the decision that such trainings are necessary and useful.

The training was included in ZAPS' annual continuing professional education programme, and participants earned credits under the programme by attending.

[Contributions \(in Slovenian\)](#)



ANNEX 4: Report and invitation of the national event in Austria: Coaching event “Raumplanung und Bodenschutz”, online (based in Innsbruck) on 18 April 2024

RAUMPLANUNG UND BODENSCHUTZ

18. April 2024
09:30 – 15:00
ONLINE

Unversiegelt. Wertvoll. Multifunktional.

Expert*innen aus Tirol und Liechtenstein informieren auf Initiative der Arbeitsgruppe Bodenschutz sowie Raumplanung und nachhaltige Entwicklung der Alpenkonvention aus der planerischen Praxis im Schnittbereich von Raumplanung und Bodenschutz

09:30 – 09:45	Einführung durch DI Christian Steiner, Land Niederösterreich, Vorsitzender der Arbeitsgruppe Bodenschutz
09:45 – 10:30	Landwirtschaftliche Vorsorgeflächen in Tirol <i>Mag. Maria Huter, Abt. Raumordnung und Statistik</i>
10:30 – 12:00	Entsiegelung innerörtlicher Grün- und Freiräume <i>DIDI Clemens Enthofer, Abt. Bodenordnung, „Forum blühendes Tirol“</i>
12:00 – 13:00	Mittagspause
13:00 – 13:45	Flächenverbrauch und Bodenversiegelung in Tirol <i>Dr. Hermann Öggl, Abt. Raumordnung und Statistik</i>
14:00 – 14:30	Bodenschutz in der Raumplanung des Fürstentums Liechtenstein <i>DI Catarina Proidl, Amt für Hochbau und Raumplanung, FL</i>
14:30 – 15:00	Diskussion & Zusammenfassung

Die Veranstaltung ist deutschsprachig und die Teilnahme kostenlos. Angemeldete erhalten den Zoom Link wenige Tage vor der Veranstaltung!



[Anmeldelink](#)



Wir freuen uns auf Ihre Teilnahme!

Protokoll

Thema

Coaching Event „Raumplanung und Bodenschutz“



Eckdaten der Sitzung

Ort	Datum	Uhrzeit
Büro Abteilung Außenbeziehungen	18.04.2024	09.00 Uhr bis 15.00 Uhr

Verfasser

Julia Leitner, Tobias Leichter

Teilnehmer

Vormittag: 65; Nachmittag: 60

Vortragende

- Christian Drechsler, Organisator, AdTLR, AG Bodenschutz
- Christian Steiner, Vorsitzender der AG Bodenschutz Alpenkonvention, AdNÖLR
- Maria Huber, Abt. Raumordnung und Statistik, AdTLR
- Clemens Enthofer, Abt. Bodenordnung, AdTLR
- Hermann Öggl, Abt. Raumordnung und Statistik, AdTLR
- Sigbert Huber, Umweltbundesamt

Besprechungspunkte

1.) Begrüßung und einleitende Worte Raumordnung in Tirol

Begrüßung durch Christian Drechsler und Hinführung zum Thema durch Christian Steiner.

Hervorhebung der Wichtigkeit des Themas Boden. Insbesondere in Anbetracht der Tatsache der zunehmenden Erschöpfung dieser nicht erneuerbaren Ressource.

Geschichtlicher Rückblick: Die Alpenkonvention als Internationales Abkommen für nachhaltige Entwicklung, wurde 1991 unterzeichnet und hat im Jahr 2002 Rechtskraft erlangt. Anfänglich wurden vor allem Themen wie Naturschutz und Berglandwirtschaft in den Fokus genommen. Mit der Zeit erlangte das Thema rund um Bodenschutz zunehmend Relevanz. Spätestens mit der Einrichtung der Arbeitsgruppe Bodenschutz wurde eine übergreifende Zusammenarbeit angestoßen. Das festigte sich vor allem in nationalen Workshops in den jeweiligen Landessprachen der Vertragsparteien und soll auch weiterhin die stetige Zusammenarbeit zwischen National- und Länderebene fördern. Wünschenswert ist ein regelmäßiger Austausch zwischen Fachdisziplinen über diverse Ebenen hinweg.

Es gehe es vor allem darum, das Bewusstsein für die stark begrenzte Ressource Boden zu stärken. Gleichzeitig auch auf die Multifunktionalität von Boden zu verweisen, egal ob nachhaltige Bewirtschaftung, die Produktion von Lebensmitteln oder Boden als Speicher, der Boden ist die Grundlage unseres Lebens.

Erwähnenswerte Aktivitäten im Rahmen der Alpenkonvention:

- [Bodenschutz Protokoll](#)
- [Long-Term Action Plan](#) (quantitative und qualitative Ansätze)
- Vertiefende Prüfung des Überprüfungsausschusses der Alpenkonvention zum Thema „[Flächensparende Bodennutzung](#)“ (2019)
- Jugendparlament zur Alpenkonvention

2.) Vortrag Maria Huber „Ladwirtschaftliche Vorsorgeflächen in Tirol“

Beruflicher Schwerpunkt: Überörtliche Raumordnung

Ausmaß, Methodik und Ausblick zum Instrument der Landwirtschaftlichen Vorsorgeflächen, das seit 10 Jahren in Tirol Anwendung findet.

1: Ausmaß landwirtschaftlicher Vorsorgeflächen:

Das Ausmaß Landwirtschaftlichen Vorsorgeflächen umfasst derzeit rund 37.000 ha – respektive 52.000 Fußballfelder und sind im Kontext der Topografie Tirols zu werten. Spezifisch gilt für diese Flächen ein Widmungsverbot für nicht landwirtschaftliche Vorhaben. Umwidmung sind daher nur durch die Landesregierung mittels VO möglich.

2: Dauersiedlungsraum und überörtliche Freihalteflächen:

In Tirol stehen nur knapp 12% der Landesfläche als Dauersiedlungsraum (DSR) und zur Verfügung. Derzeit sind davon in etwa 30% geschützt..

3: Rückblick:

2015, das internationale Jahr des Bodens war Anlass um den Auftrag des Tiroler Landtags zu festigen. Dies umfasst die Überarbeitung und Fortschreibung bestehender überörtlicher Freihalteflächen und die landesweite Ausweitung landwirtschaftlicher Vorsorgeflächen. In den letzten 10 Jahren ist die Anzahl der Regionalprogramme betreffend überörtlicher Freihalteflächen stetig bis heute auf 26 Gemeinden angestiegen. All jene weisen besehene Freiraumprogramme auf.

4: Methodik:

Zur Bewertung der Bodenbonität landwirtschaftlicher Vorsorgeflächen wurde eine Methodik entwickelt, die die Kriterien Bodenklimateil, Flächengröße und Hangneigung umfasst und hohe Akzeptanz genießt.

5: Rechtlicher Rahmen – Generelles und Rechtswirkung:

Sofern Flächen als landwirtschaftliche Vorsorgeflächen ausgewiesen werden, besteht ein Verbot der Ausweisung von Siedlungserweiterungen für Bauland in den Örtlichen Raumordnungskonzepten und somit der Widmung von Bauland in den Flächenwidmungsplänen. Widmungen von Sonderflächen nur dann möglich, wenn dies mit Schutzziel des ROP vereinbar ist. In der Praxis können Änderungen in einem geringen Ausmaß und immer im Interesse der Öffentlichkeit geschehen.

6: Fakten:

2021 gab es noch 26 Änderungen, 2022 gab nur noch 18 Änderungen. Für 2023 wird eine Tendenz hin zu noch wendigeren Änderungen erwartet, die Auswertungen laufen noch. Es wird davon ausgegangen, dass das Programm der landwirtschaftlichen Vorsorgeflächen einen gewissen Teil zu dieser positiven Entwicklung beigetragen hat. Aber auch die derzeitige Lage der Baubranche könnte dem geringeren Flächenverbrauch zuträglich gewesen sein. Allgemein lässt sich allerdings festhalten, dass es sich um ein Erfolgsrezept handelt, einerseits die enge

Zusammenarbeit zwischen Land und Gemeinden fördert und sich Vorsorgeflächen seither anzunehmender Popularität erfreuen, insbesondere bei jungen Landwirt: innen.

Fragerunde (Auswahl):

Q: Eingriff in die Hoheit der Gemeinden? Schwierigkeiten, die auftreten können?

A: Vor allem in Hinblick auf Landwirt: innen war eine breite Skepsis vorhanden, allerdings hat der rechtliche Rahmen keinerlei Auswirkung auf die Art der landwirtschaftlichen Nutzung.

Q: Geht es bei landwirtschaftlichen Vorsorgeflächen darum, Siedlungsraum zu begrenzen?

A: Gemeinden, die Raumordnungskonzept erstellen, müssen alle 10 Jahre evaluieren was gebraucht wird (Gemeinde legt also fest was benötigt wird). Es ist also nur ein Instrument um Gemeinden vorerst auf deren bestehende Baulandreserven zu verweisen, bevor wieder Neuwidmungen geschehen. Wichtigste Außenwirkung ist jedoch der Schutz der Landwirtschaft.

Q: Wieviel Prozent der Anträge zur Änderung werden abgelehnt?

A: Viele Anträge werden vor Antragstellung bereits abgewiesen nach Gesprächen mit Gemeinden. Daher halten sich die Fälle in Grenzen.

3.) Vortrag Clemens Enthofer „Entsiegelung innerörtlicher Frei- und Grünräume“

Beruflicher Schwerpunkt: Bodenordnung; Forum „Blühendes Tirol“ und „Natur im Garten“

Bewusste Entsiegelung findet schon lange statt und hat schon lange Bestand. Es gibt ein Sammelsurium an Inspirationen, Best-Practices und Ansätze für neue Projekte!

Es besteht ein prinzipieller Unterschied zwischen tatsächlich versiegelten Flächen und Flächen, die gewidmetes Bauland sind. Derzeit sind 45% Siedlungsfläche innerhalb der Baulandwidmung. Wohngebiete als Haupttreiber, allerdings dürfen auch weitere Faktoren wie beispielsweise fließender und stehender Verkehr vernachlässigt werden.

Zur Begrifflichkeit: kurz und knapp ist Entsiegelung ist Rückbau der Versiegelung. Spezifisch die Wiederherstellung von Bodenfunktionen und Verbesserter Lebensqualität. Dabei wird zwischen Vollentsiegelung und Teilentsiegelung unterschieden.

Beispiel 1 –Nibelungenplatz in Tulln an der Donau:

Es gibt einige Erfolgsbeispiele, wie der Nibelungenplatz in Tulln an der Donau: Errichtung eines Parks anstatt von Parkplätzen. In diesem Falle war die Errichtung einer dreistöckigen Tiefgarage, die Grundlage für das Gelingen der Umsetzung der Entsiegelung an dieser Stelle.

Beispiel 2 –Messepark in Innsbruck:

Ein weiteres, kleineres Erfolgsbeispiel ist der Messepark in Innsbruck. Hier wurde vor allem das „Schwammstadtprinzip“ angewandt, das einen Untergrund für die Bepflanzung von Bäumen ermöglicht. Zusammen mit Wasserdurchlässige Bodenbeläge inmitten von Straßen und Parkplätzen soll insbesondere einen Beitrag leisten in der Überschwemmungsbekämpfung.

Trends der Entsiegelung sind global erkennbar. Vor allem da die Aufwertung der Gebiete inkludiert ist. Daher immer öfter auch im Halböffentlichen und Privaten Bereich erkennbar.

Fördermodelle: Niederösterreich, Oberösterreich ca. 30% bis 50%, Eisenstadt bis zu 50% und Bayern bis zu 80%

Weitere Beispiele:

- Lingotte Turin
- Umgebung Mailand, Schwammstadtprinzip
- Berlin Entsiegelung von Schulhöfen und Spielplätzen
- Belgien Award 2021: Entsiegelung Gefängnishof in Leuven
- Promenadenring in St. Pölten, Drain Garden, Schwammstadt
- Grüne Achse quer durch Villach (vom Hbf zum Stadtpark)
- Naschmarkt Wien, 2024, Park, Marktraum mit Dachbegrünung
- Michaelerplatz Wien, 2024, Naturstein mit Versickerung, Bäume

Fragerunde:

Q: Existieren standardisierte Verfahren zur Vergabe von Förderungen?

A: Bis dato gibt es noch keine einheitlichen Kriterien. Fördermöglichkeit sind aber nur dann gegeben, wenn eine tatsächliche Entsiegelung stattfindet, dies wird von Fall zu Fall eingehen überprüft.

Q: Wie kann man von den genannten Einzelbeispielen zu einem Standard kommen – sind rechtliche Rahmenbedingungen notwendig?

A: Förderung als Incentive sind zweifellos ein geeigneter Weg. Bisher existiert aber noch kein Patent-Rezept.

4.) Vortrag Hermann Öggl „Flächenverbrauch und Bodenversiegelung in Tirol“

Das Thema Flächenversiegelung und Bodenverbrauch hat sich in den letzten Jahren sehr interessant entwickelt und spielt große Rolle für Biodiversität und Klimawandel und ist somit auch medial bzw. in der Öffentlichkeit äußerst relevant. Spannung zwischen ökologischen und ökonomischen Logiken sind hierbei besonders zu beachten.

1: Tiroler Rahmenbedingungen:

Tirol hat geringe Dauersiedlungsraum von nur 12%. Somit sind etwa 6/7 von Tirol für Wohnen, Dienstleistungen und Gewerbe etc. nicht geeignet. Die Bevölkerungsdichte im Dauersiedlungsraum beträgt 493 Einwohner (EW) pro km² für Tirol, was deutlich über dem österreichischen Durchschnitt von 270 EW pro km² liegt.

Beispiel Sistrans: Zwischen dem späten 19. Jhdt. bis 1940 hat sich die Besiedlungsdichte in Sistrans wenig geändert (abgesehen von ein paar wenigen Sommerhäusern. 30 Jahre später gab es zwar einzelne suburbanisierte Ansätze, aber Sistrans war immer noch keine sog. „Speckgürtelgemeinde“. Das änderte sich ca. 50 Jahre später. Im Jahr 2021 war die Gemeinde bereits äußerst suburbanisiert. Die Flächeninanspruchnahme, die nun 70 ha beträgt, hat sich dabei in 80 Jahren verfünffacht.

2: Problematisierung:

Begrifflichkeiten müssen geklärt werden, da Begriffe wie „Fläche“, „Boden“ und „Grund“ weitgehend als Synonym verwendet werden, aber eigentlich nicht dasselbe sind. Das führt oft zu Missverständnissen.

„*Bodenversiegelung*“: Das entscheidende Kriterium ist die Versickerungsfähigkeit bzw. die Durchlässigkeit von Wasser und Luft. Der springende Punkt ist, dass ab einem gewissen Grad der Versiegelung entscheidende Bodenfunktionen nicht mehr erfüllt werden können. Aber der Versiegelungsgrad liegt nicht immer bei 100%, sondern es gibt eine ausgeprägte Grauzone. Schotterflächen und Forstwege gewährleisten beispielsweise nur sehr wenig Wasserversickerungsfähigkeit, während normale Landwege besser für die Versickerung sind.

„*Flächeninanspruchnahme*“: Flächen, auf denen keine natürlichen Lebensräume mehr bestehen und die nicht mehr für die Land- und Forstwirtschaft zur Verfügung stehen – also militärische Anlagen, Rohstoffabbauflächen etc.

Aber es gibt auch hier gewisse Grauzonen: Golfplätze, Skipisten, Altablagerungen/ Altlasten/ Bodenaushubdeponien, Photovoltaikflächen (darunter ist landwirtschaftliche Nutzung nötig) etc.

Insgesamt: Die zentralen Bodenfunktionen und naturnahe Lebensräume gehen verloren. Funktionierende Böden sind natürlich wichtig, aber präzise Unterscheidungen bleiben schwierig.

3: Methoden und Ergebnisse I: Tirol im Österreichvergleich:

Daten für Tirol: 364 km² sind in Anspruch genommen. Das macht 2,9% der Landesfläche bzw. 23,2% des Dauersiedlungsraums aus (470m² pro EW). Tirol ist bei diesem Wert deutlich überdurchschnittlich und die Zahl nimmt jährlich zu.

4: Methoden und Ergebnisse II: Eigene Ansätze:

Die Baulandquote pro Einwohner ist ähnlich der Bevölkerungsdichte.

Zwei große Einschränkungen: Viel Bauland ist nicht widmungspflichtig. Mit der Widmung ist außerdem keine automatische Widmung verbunden, sondern nur Lizenz zur Nutzung (Flächeninanspruchnahmepotenzial).

Aktuelle Daten: Es gibt noch 3200 ha Baulandreserven. Das ist eine relativ große Menge, theoretisch geeignet für ungefähr 100.000 EW.

Versiegelung: Eigener Datensatz mit Geodaten. Die Ergebnisse der Auswertungen sind sehr zuverlässig und relevant. Das Gesamtausmaß beträgt 225 km² (Anteile: Verkehrsflächen 48%, Gebäude 34%, sonstige Versiegelung 18%). Das sind 15% des Dauersiedlungsraum und 1,8% der Gesamtfläche Tirols.

Verdichtungsräume: Versiegelungsflächen pro Einwohner sind in Städten am niedrigsten (IBK) und in der Peripherie am höchsten. Dasselbe gilt für Verkehrsflächen: In den verdichteten Räumen sind die Verkehrsflächen pro EW am geringsten, im ländlichen Raum am höchsten.

Überlagerung Versiegelung und Flächenwidmung: Insgesamt überdecken sich die beiden Kategorien Versiegelung und Flächenwidmung aber nur zu 50%.

5: Desiderata und Ausblicke:

Neue Projekte mit neuen Methoden sind angedacht: Infrarot, Luftbilder und KI-Methoden sollen eingesetzt werden. In diese Richtung wird es also weitergehen. Auch ein Datensatz mit einer laufenden Aktualisierung wäre ideal. Bei der Teilversiegelung könnte z.B. auch eine eigene Klasse gebildet werden.

Für die Raumordnung wäre eine Untersuchung auf drei Ebenen ideal:

- Mikroebene: Versiegelungsmonitoring
- Mesoebene: Nutzungseffizienz
- Makroebene: Nachhaltiges Raumgefüge

Fragerunde:

Q: Warum werden keine Satellitenbilder verwendet für Baulandreserven?

A: Die zur Verfügung stehenden Satellitenbilder sind relativ ungenau im Vergleich zu den Luftbildern.

Q: Gibt es Laserscandaten zur Effizienz der Bebauung bzw. Bauhöhe?

A: Es gibt schon solche Auswertungen und diese sind gut, aber sie werden bislang eher für 3D-Ortspläne verwendet. Es ist vor allem eine hohe Rechenleistung nötig. Außerdem fehlen digitale Daten, denn die Bebauungspläne sind allgemein noch nicht digitalisiert.

Q: Gibt es Gemeindeflussmöglichkeiten bei der Entwicklung neuer Siedlungsräume?

A: Es gibt schon Mitgestaltungsräume, aber so etwas muss der entsprechende Gemeinderat beschließen.

Q: Welche Auswirkungen haben solche Darstellungen?

A: Schwer zu sagen. Wenn man Versiegelung verhindern will, wären dichtere Siedlungsstrukturen besser. Vor allem der Verkehr braucht sehr viel Platz. Ruhender Verkehr ist auch eine unterbewertete Größe bei der Versiegelung.

Q: Wie wird Widmungsbau land rückgewidmet?

A: Es gibt dazu immer wieder Überlegungen. Eine Nutzung bestehender Baulandreserven wäre allgemein zu bevorzugen. Seit 2020 werden nicht verwendete Baulandflächen nur noch für 10 Jahre gewidmet gemäß einer Gesetzesnovellierung. Neben einer Maßnahme gegen lukrative Baulandhortung gibt es auch weitere Maßnahmen – allerdings mit gemischten Ergebnissen.

5.) Vortrag Sigbert Huber „Nutzung der Bodenfunktionsbewertung für den Bodenschutz“

Die Bodenfunktionsbewertung wird anhand von 2 Beispielen angewendet:

- Umweltverträglichkeitsprüfungen (UVP)
- Forschungsprojekt DACHBODEN: Kompensation von Bodenversiegelung beim Straßenbau

Beispiel 1 – UVP:

Hierbei handelt es sich um eine Erfassung der Leistungsfähigkeit von Böden basierend auf Bodenfunktionen: Fruchtbarkeit, Lebensraum, Standortpotenzial, Abflussregulierung etc. Darauf aufbauend ergibt sich ein Funktionserfüllungsgrad (5 bester, 1 schlechtesten).

Der dazugehörige Leitfaden (SG Boden und Fläche in der UVP) wurde vom Umweltbundesamt schon erstellt.

In der Einzelfallprüfung gibt es bestimmte „Erheblichkeitskriterien“ je nach Art des Bodens und nach der vermuteten Erheblichkeit. Dabei hilft auch die „BEAT“ Karte des Umweltbundesamts.

Beispiel 2 – DACHBODEN:

Das Werkzeug ist eine Formel für die Bodenfunktionsbewertung. Wesentliche Funktionen werden ermittelt und nach Hektar gewichtet. Am Ende entstehen „Bodenwerteinheiten“, die für Bewertungen und Kompensationsmaßnahmen herangezogen werden können.

Es müssen auch gewisse Rahmenbedingungen für die Anwendung dieses Instruments geschaffen werden.

Fragerunde:

Q: Kann die Bodenfunktionsbewertung auf andere Bereiche (Kraftwerke/Gewerbegebiete) angewendet werden?

A: Das Instrument sollte durchaus modifizierbar sein für andere Anliegen.

Q: Ist die Bodenbewertung in einer Karte erfassbar?

A: Ja, eine Karte zur Bodenfunktionsbewertung steht im Internet zur Verfügung, aber nur amtsintern.

6.) Zusammenfassung Christian Steiner

Die Highlights waren:

- *Landwirtschaftliche Vorsorgeflächen* sind ein starkes Instrument. Gemeinden wollen dabei mehr und nicht weniger solche Flächen.
- *Entsiegelung*: Einzelbeispiele ergeben imposante Summe. Verkehrsflächen und Gewässer bieten hier viel Potenzial. Auch private Entsiegelung ist wichtig. Nicht nur Wasser, auch Lebensqualität allgemein ist betroffen.
- *Flächenverbrauch und Bodenversiegelung*: Definitionen und historische Entwicklung waren ein wichtiger Beitrag. Das Projekt zur Beurteilung der Versiegelung lieferte interessante Ergebnisse, vor allem bezüglich des hohen Anteils der Verkehrsflächen.
- Die Methodik der *Bodenfunktionsbewertung* des Umweltbundesamts ist sehr ansprechend und könnte ein wesentlicher Beitrag für die Zukunft sein.

7.) Abmoderation

Zusammenfassung, Einladung zum Feedback und Danksagung.

ANNEX 5: Program of the national event in France: “Anticipate changes in Alpine biodiversity: how can planning and development stakeholders define, monitor and evaluate it?”, Grenoble on 23 May 2024

Anticiper les évolutions de la biodiversité alpine : Comment les acteurs de la planification et de l'aménagement peuvent la définir, la suivre, l'évaluer ?

Atelier de travail et d'échanges entre acteurs de la planification et de l'aménagement, acteurs de la biodiversité et acteurs de l'ingénierie territoriale à l'échelle du massif des Alpes



23
mai
2024

Grenoble

DDT de l'Isère – 17 bvd Joseph Vallier
Salle J20

Journée organisée par le Cerema et le Commissariat du Massif des Alpes / Groupe de travail sur la biodiversité alpine

Objectifs de l'atelier : réunir des acteurs de la planification et de l'aménagement et des acteurs de l'ingénierie territoriale du massif des Alpes motivés pour agir en faveur de la biodiversité alpine, avec des acteurs qui travaillent sur la biodiversité, afin de :

- **partager les difficultés et ressources**, pour mieux suivre et évaluer l'état de la biodiversité alpine aux différentes échelles de la planification et de l'aménagement, comprendre ses tendances d'évolution en tenant compte des effets cumulés (projets d'aménagement, évolution des pratiques et comportements, changement climatique),
- **identifier ensemble les besoins et pistes d'actions** pour pouvoir évaluer les pressions sur la biodiversité alpine et aider en connaissance de cause les prises de décision des acteurs de la planification et de l'aménagement.

Publics visés : Etablissements publics de SCoT, collectivités, porteurs de projets d'aménagement et maîtres d'ouvrage, conservatoires d'espaces naturels, PNR, parcs nationaux, associations environnementales, gestionnaires d'espaces naturels, chercheurs, chambres consulaires, DREAL, DDT, Agences d'urbanisme, CAUE, bureaux d'études ...

Pré-programme

09h45	Accueil
10h15	Ouverture de la journée par le Commissariat du Massif des Alpes, le Cerema et Francis Odier, Référent du Groupe de travail Biodiversité alpine du Comité du massif des Alpes Introduction : La biodiversité alpine, pourquoi s'en préoccuper dans les politiques de planification et d'aménagement ? par Stéphanie Gaucherand, Ecologue, Laboratoire Ecosystèmes et sociétés en montagne, INRAE, Université Grenoble-Alpes 1ère séquence de travail en sous-groupes
12h30	Déjeuner au restaurant administratif (à la charge des participants, à régler sur place)
13h20	Retour en salle et balade de synthèse des travaux de la matinée
14h00	Témoignages d'acteurs de la planification et de l'aménagement en introduction des travaux de l'après-midi avec Yannick Simon, Chargé de mission Biodiversité, SCoT Rives du Rhône, Aline Breton, Responsable Pôle Aménagement, CC des Vallées de Thônes et d'autres témoignages 2 ^e séquence de travail en sous-groupes
16h30	Mise en commun des travaux et clôture de la journée



INSCRIPTIONS

Les inscriptions se font uniquement en ligne, en cliquant sur le lien ci-dessous :

<https://enqueteur.cerema.fr/index.php?r=survey/index&sid=867316&lang=fr>

Date limite d'inscription : 16 mai 2024

Pour tout renseignement :

Claire Faessel-Virole (04 74 27 51 05) ; Maud Jarru (04 74 27 51 75), Cerema Centre-Est
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ANNEX 6: Report of the national event in Germany: “Workshop Bodenschutz und Raumplanung”, Benediktbeuern on 1 – 2 July 2024

Workshop Bodenschutz und Raumplanung

***Zentrum für Umwelt und Kultur Benediktbeuern
01.-02. Juli 2024***



ALPENKONVENTION
CONVENTION ALPINE
ALPSKA KONVENCIJA
CONVENZIONE DELLE ALPI

Impressum

Der hier dokumentierte Workshop ist das Ergebnis einer gemeinschaftlichen Initiative der Arbeitsgruppen Bodenschutz und Raumplanung und nachhaltige Entwicklung im Rahmen der Mandatsphase 2023-2024.

Arbeitsgruppe Bodenschutz

Vorsitz: Christian Steiner (Niederösterreichische Agrarbezirksbehörde)

Delegierte der deutschen Vertragspartei: Dr. Silvia Pieper (Umweltbundesamt), Bernd Schilling (Bayerisches Landesamt für Umwelt), Jochen Daschner (Bayerisches Staatsministerium für Umwelt und Verbraucherschutz)

Arbeitsgruppe Raumplanung

Vorsitz: Dr. Josiane Meier (Bundeministerium für Wohnen, Stadtentwicklung und Bauwesen)

Delegierte der deutschen Vertragspartei: Dr. Josiane Meier (Bundeministerium für Wohnen, Stadtentwicklung und Bauwesen), Dr. Stefan Esch (Bayerisches Staatsministerium für Wirtschaft, Landesentwicklung und Energie)



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ifuplan Institut für Umweltplanung und Raumentwicklung GmbH & Co KG (Claudia Schwarz / Florian Lintzmeyer)



Juli 2024

Hintergrund

Der Workshop ist eine gemeinschaftliche Initiative der deutschen Vertreterinnen und Vertreter in den Arbeitsgruppen Bodenschutz sowie Raumplanung und nachhaltige Entwicklung der Alpenkonvention. Auf Seiten des Bodenschutzes sind dies das Bayerische Staatsministerium für Umwelt und Verbraucherschutz mit dem Landesamt für Umwelt und den Fachbereichen Bodenschutz der Wasserwirtschaftsämter. Auf Seiten der Raumplanung sind dies das Bundesministerium für Wohnen, Stadtentwicklung und Bauwesen, welches den Vorsitz der AG Raumplanung inne hat, und das Bayerische Staatsministerium für Wirtschaft, Landesentwicklung und Energie mit den Flächenmanagerinnen und Flächenparmanagern an den Höheren Landesplanungsbehörden der Bezirksregierungen. Die Finanzierung des Workshops erfolgte durch das Bundesministerium für Wohnen, Stadtentwicklung und Bauwesen.

Der Workshop ist eine Fortführung des alpenweiten Austausches zwischen Bodenschutz und Raumplanung, der im Frühjahr 2022 in Form einer alpenweiten Tagung in München begonnen hatte. Ziel ist die Verbesserung des qualitativen Bodenschutzes im Alpenkonventionsgebiet und darüber hinaus. Der Workshop reiht sich in die auf nationaler Ebene durchgeführten Folgeveranstaltungen ein, die in der Mandatsphase 2023/2024 der Alpenkonvention u.a. bereits in Österreich, Frankreich und Slowenien durchgeführt wurden.



Montag, 01.07.2024

TOP 1 Begrüßung und Vorstellung der Alpenkonvention sowie der AG Raumplanung und AG Bodenschutz (Dr. Josiane Meier (BMWSB)/ Vera Bornemann (Ständiges Sekretariat der Alpenkonvention))

Frau Dr. Meier stellt die Arbeiten der Arbeitsgruppe Raumplanung der Alpenkonvention vor, die der Anlass für den Workshop sind. Die AG Raumplanung hat sich in der jüngeren Vergangenheit u.a. mit folgenden Themen beschäftigt:



- Quantitative Flächensparziele in den Alpenländern,
- Zusammenstellung von Leitfäden zur Innenentwicklung in den Alpenländern
- und einer Bestandserfassung der grenzüberschreitenden raumplanerischen Zusammenarbeit im Alpenraum

In der aktuellen Mandatsphase wurde ein Prozess zur Formulierung einer Raumplanungsperspektive für den Alpenraum eingeleitet.

Die o.g. Dokumente sind entweder bereits verfügbar oder stehen nach Annahme bei der kommenden Alpenkonferenz Anfang 2025 öffentlich zur Verfügung.



Fr. Bornemann stellt die Arbeiten der Arbeitsgruppe Bodenschutz der Alpenkonvention und die gemeinsamen Aktivitäten mit der AG Raumplanung vor. Ein Meilenstein dazu war die alpenweite Tagung zu qualitativem Bodenschutz und Raumplanung, die im März 2022 in München durchgeführt wurde. Anlässlich dieser Tagung wurde vereinbart, analoge Veranstaltungen als Kooperationsprojekt zwischen den Ländervertretern in der AG Bodenschutz bzw. AG Raumplanung durchzuführen.

TOP 2 Vorstellung Flächensparmanager (Katharina Ziegltrum (StMWi), siehe Präsentation im Anhang)



Frau Ziegltrum stellt den Aufgabenbereich sowie die Instrumente der Flächensparmanager an den bayerischen Bezirksregierungen im Rahmen der ressortübergreifenden Bayerischen Flächensparoffensive vor.

TOP 3 Was ist Boden? (Dr. Robert Traidl (LfU), siehe Präsentation im Anhang)



Herr Dr. Traidl stellt zunächst vor, was Böden sind, wie sie entstehen und anhand welcher Parameter sie erfasst, beschrieben und schließlich in Karten dargestellt werden. Wichtige Begriffe wie Bodentyp und Bodenart werden erläutert, da dies die Voraussetzung ist, um Bodenkarten verstehen zu können. Er zeigt auf, dass sich die dabei in Deutschland eingesetzte Bodensystematik zum Teil von anderen Alpenstaaten unterscheidet, so dass eine Harmonisierung über den gesamten

Alpenraum noch nicht in naher Zukunft möglich ist. Es wird erklärt, dass die sogenannte Bodenübersichtskarte im Maßstab 1:25.000 viele Generalisierungen enthält. Gerade in den Alpen sind kleinräumige wechselnde Böden die Regel und Aussagen zu Bodenfunktionen aufgrund der Generalisierung teilweise fachlich nicht sinnvoll. Hr. Daschner weist darauf hin, dass genaue örtliche Aussagen nicht auf der Grundlage der Übersichtsbodenkarte zu treffen sind, sondern einer detaillierteren Untersuchung bedürfen.

TOP 4 Boden einen Wert geben: Wie kann man Böden bewerten und vergleichen? Bodenfunktionen und bodenschutzrelevante Grundlagen in der Planung (Peter Spörlein (LfU), siehe Präsentation im Anhang)

Hr. Spörlein stellt in seinem Vortrag dar, welche Bodenfunktionskarten aus der Übersichtsbodenkarte 1:25.000 abgeleitet werden und wie diese als Grundlagen in der Raumplanung vor allem im vorsorgenden Bodenschutz nutzbar sind. Es werden die vielzähligen und unterschiedlichen Bodenfunktionen vorgestellt, deren Kenntnis für die Planung wichtig sein kann und dafür Beispiele genannt. Hr. Spörlein macht zudem deutlich, dass es keinen aggregierten Gesamtwert gibt, der alle Bodenfunktionen gleichermaßen berücksichtigt und zeigt die Grenzen der Aussagekraft der Bodenfunktionskarten auf. Eine Ausgleichspflicht verloren gegangener Bodenfunktionen stellt einen Ansatz zur Monetarisierung dar, findet derzeit aber nur bei größeren Projekten statt (Bsp. BMW-Werk Straßkirchen).



TOP 5 Bodenschutz in Verbindung mit den PV-Freiflächenanlagen (Petra Wölfel (LfU), siehe Präsentation im Anhang)

Da die Kommunen derzeit sehr viele Flächenausweisungen für Freiflächen-PV-Anlagen tätigen und Unsicherheiten auf Seite der Planer bestehen, wie diese hinsichtlich des Bodens zu bewerten sind, wurde das Thema von den Flächensparmanagern im Vorfeld der Veranstaltung ausdrücklich gewünscht.



Fr. Wölfel zeigt anhand von vielen anschaulichen Beispielen, wie unterschiedlich die Auswirkungen dieser Anlagen auf Böden sind, je nachdem welche Aufstellung der Paneele gewählt wird und wie das Relief (Hangneigung und Exposition) der Fläche ist. In ungünstigen Fällen tragen die Anlagen deutlich zu Bodenerosion bei, während bei gut gemachten Anlagen mit angemessenen Abständen die Wirkungen auf den Boden gering bleiben. Aber: Verbesserungen für den Boden

und die Biodiversität, wie z.B. artenreiche Magerwiesen unter PV-Anlagen sind nicht die Regel (Mangel an Wachstumsfaktoren Wasser und Licht). Agri-PV mit ausreichend Abstandsflächen (Pultmodule) kann hingegen gut funktionieren (Bsp. Weideflächen). Sinnvoll wäre jedoch, vor dem Freiraum zunächst Gewerbeflächen/-dächer, Straßenböschungen, Bahnlinien stärker für PV-Anlagen zu nutzen. Fr. Wölfel zeigt abschließend verschiedene Informationsquellen auf und verweist auf Planungshinweise zur Freiflächen-PV, die sich derzeit in Abstimmung befinden und demnächst im Energieatlas Bayern veröffentlicht werden. Würden Kommunen Bodenschutzkonzepte erstellen, so wäre eine spätere Planung vereinfacht (Bsp. [Bodenschutzkonzept Wetzlar](#)).

Diskussion

In der Diskussion wurden u.a. folgende Punkte benannt:

- Die Bodenschutzexperten verfügen über viele Kenntnisse, die in Planungsprozessen vor Ort aber nicht zum Tragen kommen → es liegt daher großes Potenzial in einer engeren Zusammenarbeit zwischen Flächensparmanagern und Bodenschützern am LfU/WWA
- EU Bodenüberwachungsgesetz¹ und Ziel „gesunde Böden bis 2050“ kann Belange des Bodenschutzes in der Planung stärken, bedarf aber noch einer Konkretisierung der Begrifflichkeiten (u.a. was sind „gesunde Böden“?)
- Die Regeneration degradierter Böden bedarf eines Zieles, welche Bodenfunktionen dabei ins Auge gefasst werden, denn alle Funktionen sind in der Regel nicht wiederherstellbar. Davon hängt auch die Durchführbarkeit ab.
- Wenn Bodenfunktionsverluste ein bestimmtes Maß überschreiten, sind Kompensationsmaßnahmen an anderer Stelle erforderlich (Bsp. BMW-Batteriefabrik Straßkirchen, Flächenneuanspruchnahme von 100 ha wird an anderer Stelle zu einem gewissen Anteil als Kompensationsmaßnahme entsiegelt)
- Die Steuerung von Freiflächen-PV ist für die Landes- und Regionalplanung eine Herausforderung mit hoher Dringlichkeit: Das LEP bietet hier lediglich einen Grundsatz der Steuerung dieser Anlagen auf ertragsschwache Böden. Die Fachstellen an den WWA könnten teilweise noch expliziter zu Vorhaben Stellung nehmen. Da es aber nicht

¹ <https://www.consilium.europa.eu/en/press/press-releases/2024/06/17/soil-monitoring-law-eu-on-the-pathway-to-healthy-soils-by-2050/>

an allen WWA Bodeningenieure gibt, ist dies aus Kapazitätsgründen nicht immer möglich.

- Abstimmungsschwierigkeiten mit den Unteren Naturschutzbehörden: Dort steht der Arten- und Biotopschutz gegenüber den Bodenschutzbelangen sehr stark im Vordergrund. Bodenschutz hat gegenüber dem Naturschutz noch einen schweren Stand.
- Freiflächen-PV: Es gibt eine Problematik bei Freiflächen-PV in (Süd-)Hanglagen mit Wasserabfluss/Erosion. Allerdings ist möglicherweise beim Vergleich zwischen Maisanbau in Hanglage ist eine gut gemachte Freiflächen-PV-Anlage mit Grünland unter dem Strich positiv zu werten.
- Fortschreibung der Regionalpläne bzgl. Vorrang- und Vorbehaltsgebiete Landwirtschaft und Klimaschutz: Interesse der Regionalplanerinnen und Regionalplaner an Planungsgrundlagen des Bodenschutzes (z.B. Übersichtsmoorbodenkarten, Karten zu Infiltrations- und Retentionsvermögen)
- Es besteht weiterhin ein Bewusstseinsdefizit bei Entscheidungsträgern



Schlussrunde und Ausblick

Zum Abschluss des ersten Tages wurden die Teilnehmerinnen und Teilnehmer gebeten, ihre Eindrücke des Tages in folgende drei Kategorien unterteilt festzuhalten:

Was war für Sie der interessanteste Aspekt? Was nehmen Sie mit nach Hause?

- Fachlicher Austausch / Austausch verschiedener Fachbereiche und Ressorts: weitermachen lohnt sich
- Wir sind nicht allein, die Anzahl der „Bodenschutzkämpfer“ nimmt zu
- Gegenseitige Verteiler nutzen, um zu informieren
- Dass Flächensparmanager z.T. in der Planung nicht einbezogen werden
- Herausforderungen / potenzielle negative Auswirkungen der Freiflächen-PV auf Böden
- Neue Ideen und Beispiele im Bereich vorsorgender Bodenschutz
- Thema Boden mehr in Sensibilisierungs- und Informationsmaßnahmen integrieren
- Flächensparmanager sind ein weiterer Baustein beim Bodenschutz
- Bodenschützer vereinigt euch: Flächensparmanager, Landwirtschaftsverwaltung, Wasserwirtschaft, ...
- Bodenschutz ist nicht mit Naturschutz gleichzusetzen
- Boden ist vielschichtiger als gedacht. Boden lebt!
- Bodenschutz als gleichberechtigter Fachbereich in der Planung
- Was steckt in/hinter Bodenkarten
- Hoffnung



Interesse an einer Fortführung des Austauschs zwischen den Fachressorts? Ideen dazu?

- Wie kann man Bodenschutz in die Gemeinden bringen?
- Konkrete weitere Zusammenarbeit / weitere Zusammenarbeit lohnt sich
- Zusammenarbeit bei Fortschreibung der Regionalpläne (Klimaschutz, Landwirtschaft,...)
- Vernetzung ist unheimlich wichtig, um mit einer Stimme zu sprechen
- Fortführung ja, Format noch unklar
- Konkrete Ansprechpartner für die Regierungen, um fallspezifischen Austausch zu ermöglichen / Kontakt zu Regionsbeauftragten suchen



Welche Themen sind offen geblieben, über welche würde ich in Zukunft gerne sprechen?

- „scharfe Schwerter“ (gesetzliche Vorgaben) diskutieren
- Wie sehr kann man „Anwälte“ für den Boden sein → wenig Grundlagen im LEP
- Gewichtung von Bodenschutzbelangen beim Flächensparen
- Standards zur landes-/regionalplanerischen Berücksichtigung
- Thema Bodenfunktionen an Entscheidungsträger vor Ort kommunizieren

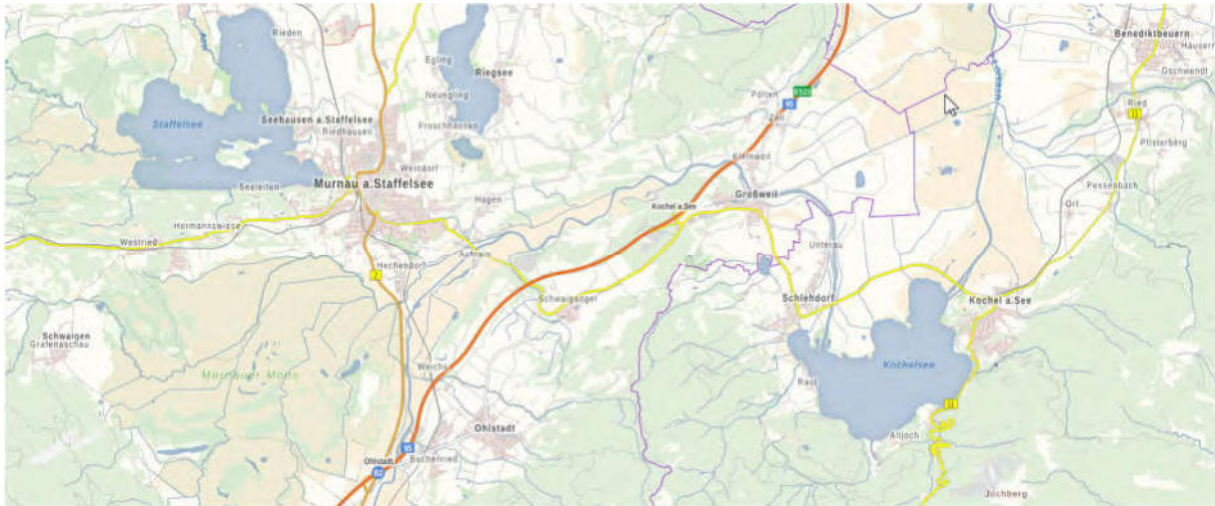
Dienstag, 02.07.2024, 08:30 – 12:30 Uhr

Exkursion "Böden in der Landschaft"

Dr. Traidl (LfU) erläutert auf der Fahrt von Benediktbeuern über Schlehdorf nach Murnau mit Zwischenstopps nördlich von Schlehdorf² und nördlich des Murnauer Moores die Entstehungsgeschichte der Landschaft, deren eiszeitliche Überprägung und die Bodengenese. Anhand von verschiedenen Bodenprofilen wurde die Bodenansprache im Rahmen von Bodenkartierungen und auch die Herausforderungen bei der Erstellung flächendeckender Bodenkarten erläutert.



² Informationen zur angesprochenen Folgenutzung des ehemaligen Klosters Schlehdorf durch die Wogeno eG finden sich unter diesem Link der Initiative Zukunft Kulturraum Kloster zur Transformation ehemaliger Klöster: <https://zukunftkulturraumkloster.de/de/loesungen/best-practice/wogeno-genossenschaft-ubernimmt-das-klostergebäude-in-schlehdorf>



Quelle: Übersichtsbodenkarte Bayern 1:25.000 ([UmweltAtlas Bayern](#))

Anlagen

Programm

Präsentation Flächensparmanager (Fr. Ziegltrum)

Präsentation Was ist Boden (Dr. Traidl)

Präsentation Boden einen Wert geben (Dr. Spörlein)

Präsentation Bodenschutz bei Planung, Bau und Betrieb von Freiflächen PVA (Fr. Wölfel)

Programm

Zeit	Programmpunkt	Referent:in
13:30	Begrüßung, Vorstellung der Alpenkonvention sowie der AG Raumplanung und nachhaltige Entwicklung und AG Bodenschutz	Fr. Dr. Meier, BMWSB, Vera Bornemann, Ständiges Sekretariat der Alpenkonvention
13:45	Vorstellung Flächensparmanager	Fr. Ziegltrum, StMWi
14:00	Was ist Boden?	Hr. Dr. Traidl, LfU
14:45	Fragen zum Vortrag	
15:00	Kaffeepause	
15:30	Wie kann man Böden bewerten und vergleichen? Bodenfunktionen und bodenschutzrelevante Grundlagen in der Planung	Hr. Dr. Spörlein, LfU
16:30	Bodenschutz in Verbindung mit den PV-Freiflächenanlagen	Fr. Wölfel, LfU
17:00 – 17:45	Fragen zum Vortrag und Raum für Diskussion und Austausch	Plenum

02.07.2024, 08:30 – 12:30 Uhr

Exkursion "Böden in der Landschaft"

Workshop on soil protection and spatial planning

Center for Environment and Culture Benediktbeuern
1-2 July 2024



Imprint

The workshop documented here is the result of a joint initiative of the Soil Protection and Spatial Planning and Sustainable Development Working Groups as part of the 2023-2024 mandate phase.

Soil Protection Working Group

Chair: Christian Steiner (Authority of Land Reform, Department for Rural Development, Lower Austria)

Delegates of the German Contracting Party: Dr. Silvia Pieper (Federal Environment Agency), Bernd Schilling (Bavarian State Office for the Environment), Jochen Daschner (Bavarian State Ministry for the Environment and Consumer Protection)

Spatial Planning and Sustainable Development Working Group

Chair: Dr. Josiane Meier (Federal Ministry of Housing, Urban Development and Building)

Delegates of the German contracting party: Dr. Josiane Meier (Federal Ministry of Housing, Urban Development and Building), Dr. Stefan Esch (Bavarian State Ministry of Economic Affairs, Regional Development and Energy)

Permanent Secretariat of the Alpine Convention

Vera Bornemann (Soil Protection Working Group) / Živa Novljan (Spatial Planning and Sustainable Development Working Group)



Funded by the Federal Ministry of Housing, Urban Development and Building



Support, documentation and image rights:

ifuplan Institute for Environmental Planning and Spatial Development GmbH & Co KG (Claudia Schwarz / Florian Lintzmeyer)



Background

The workshop is a joint initiative of the German representatives in the Soil Protection and Spatial Planning and Sustainable Development working groups of the Alpine Convention. On the soil protection side, these are the Bavarian State Ministry for the Environment and Consumer Protection with the State Office for the Environment and the Soil Protection Departments of the Water Management Authorities. On the spatial planning side, these are the Federal Ministry of Housing, Urban Development and Building, which chairs the Working Group on Spatial Planning and Sustainable Development, and the Bavarian State Ministry of Economic Affairs, Regional Development and Energy with the land managers at the higher regional planning authorities of the district governments. The workshop was funded by the Federal Ministry of Housing, Urban Development and Building.

The workshop is a continuation of the Alpine-wide exchange between soil protection and spatial planning, which began in spring 2022 in the form of an Alpine-wide conference in Munich. The aim is to improve the quality of soil protection in the Alpine Convention area and beyond. The workshop is one of several follow-up events held at national level during the 2023/2024 mandate phase of the Alpine Convention, including in Austria, France and Slovenia.



Monday, 01.07.2024

ITEM 1 Welcome and presentation of the Alpine Convention and the Spatial Planning and Soil Protection Working Groups (Dr. Josiane Meier (BMWSB)/ Vera Bornemann (Permanent Secretariat of the Alpine Convention))

Dr. Meier presents the work of the Spatial Planning Working Group of the Alpine Convention, which is the reason for the workshop. In the recent past, the Spatial Planning Working Group has dealt with the following topics, among others:



- Quantitative land-saving targets in the Alpine countries,
- Compilation of guidelines for inner-city development in the Alpine countries
- and an inventory of cross-border spatial planning cooperation in the Alpine region

In the current mandate phase, a process was initiated to formulate a spatial planning perspective for the

Alpine region.

The above-mentioned documents are either already available or will be publicly available after adoption at the upcoming Alpine Conference in early 2025.



Ms. Bornemann presents the work of the Soil Protection Working Group of the Alpine Convention and the joint activities with the Spatial Planning Working Group. One milestone was the Alpine-wide conference on qualitative soil protection and spatial planning, which was held in Munich in March 2022. At this conference, it was agreed to hold similar events as a cooperation project between the country representatives in the Soil Protection Working Group and the Spatial Planning Working Group.

ITEM 2 Presentation of the land-saving manager (Katharina Ziegltrum (StMWi), see presentation attached)



Ms. Ziegltrum presents the area of responsibility and the instruments of the land-saving managers at the Bavarian district governments as part of the interdepartmental Bavarian land-saving campaign.

TOP 3 What is soil? (Dr. Robert Traidl (LfU), see presentation in the appendix)



Dr. Traidl first introduces what soils are, how they are formed and which parameters are used to record, describe and finally depict them on maps. Important terms such as soil type and soil type are explained, as this is a prerequisite for understanding soil maps. It shows that the soil classification system used in Germany differs in part from other Alpine countries, so that harmonization across the entire Alpine region is not yet possible in the near future. It is explained that the so-called soil overview map at

a scale of 1:25,000 contains many generalizations. Especially in the Alps, small-scale changing soils are the rule and statements on soil functions are sometimes not technically meaningful due to the generalization. Mr. Daschner points out that precise local statements cannot be made on the basis of the general soil map, but require a more detailed investigation.

TOP 4 Giving soil a value: How can soils be evaluated and compared? Soil functions and soil protection-relevant principles in planning (Peter Spörlein (LfU), see presentation in the appendix)

In his presentation, Mr. Spörlein explains which soil function maps are derived from the 1:25,000 general soil map and how these can be used as a basis for spatial planning, especially in preventive soil protection. The numerous and different soil functions are presented, knowledge of which can be important for planning, and examples are given. Mr. Spörlein also makes it clear that there is no aggregated total value that takes all soil functions equally into account and points out the limits of the informative value of soil function maps. An



obligation to compensate for lost soil functions represents an approach to monetization, but currently only takes place for larger projects (e.g. BMW battery plant in Straßkirchen).

TOP 5 Soil protection in connection with ground-mounted PV systems (Petra Wölfel (LfU), see attached presentation)

As local authorities are currently designating a large number of areas for ground-mounted PV systems and there is uncertainty on the part of planners as to how these are to be assessed with regard to the land, the topic was expressly requested by the land-saving managers in the run-up to the event.



Ms. Wölfel uses many illustrative examples to show how different the effects of these systems on soils are, depending on the chosen positioning of the panels and the relief (slope inclination and exposure) of the area. In unfavorable cases, the systems contribute significantly to soil erosion, while in well-designed systems with appropriate spacing, the effects on the soil remain low. However, improvements for the soil and biodiversity, such as species-rich rough pastures

under PV systems, are not the rule (lack of growth factors water and light). On the other hand, agri-PV with sufficient spacing (desk modules) can work well (e.g. pastures). However, it would make sense to first use commercial areas/roofs, road embankments and railroad lines for PV systems before open spaces. Finally, Ms. Wölfel points out various sources of information and refers to planning guidelines for ground-mounted PV, which are currently being coordinated and will soon be published in the Bavarian Energy Atlas. If local authorities were to draw up soil protection concepts, subsequent planning would be simplified (e.g. [Wetzlar soil protection concept](#)).

Discussion

The following points were mentioned in the discussion:

- Soil protection experts have a lot of knowledge that is not used in local planning processes → There is therefore great potential in closer cooperation between land conservation managers and soil conservationists at the LfU/WWA
- EU Soil Monitoring Act¹ and the "healthy soils by 2050" target can strengthen soil protection concerns in planning, but the terms still need to be specified (e.g. what are "healthy soils"?)
- The regeneration of degraded soils requires a target as to which soil functions are to be considered, as all functions cannot usually be restored. Feasibility also depends on this.
- If soil function losses exceed a certain level, compensation measures are required elsewhere (e.g. BMW battery factory in Straßkirchen, new land use of 100 ha is unsealed elsewhere to a certain extent as a compensation measure)
- The control of open-space PV is a highly urgent challenge for state and regional planning: The LEP only offers a principle for controlling these installations on low-yield soils. In some cases, the specialist departments at the WWA could comment more explicitly on projects. However, as there are not soil engineers at all WWAs, this is not always possible for capacity reasons.
- Coordination difficulties with the lower nature conservation authorities: There, species and biotope protection is very much in the foreground compared to soil protection concerns. Soil protection is still in a difficult position compared to nature conservation.

¹ <https://www.consilium.europa.eu/en/press/press-releases/2024/06/17/soil-monitoring-law-eu-on-the-pathway-to-healthy-soils-by-2050/>

- Open-space PV: There is a problem with open-space PV on (south-facing) slopes with water runoff/erosion. However, when comparing maize cultivation on slopes, a well-designed open-space PV system with grassland may be a positive factor.
- Updating regional plans with regard to priority and reserved areas for agriculture and climate protection: interest of regional planners in planning bases for soil protection (e.g. overview maps of peatland soils, maps of infiltration and retention capacity)
- There is still a lack of awareness among decision-makers



Final round and outlook

At the end of the first day, the participants were asked to write down their impressions of the day, divided into the following three categories:

What was the most interesting aspect for you? What will you take home with you?

- Professional exchange / exchange between different specialist areas and departments: it pays to keep going
- We are alone, the number of "soil protection fighters" is increasing
- Use reciprocal distribution lists to provide information
- The fact that space-saving managers are sometimes not included in the planning process
- Challenges / potential negative impacts of ground-mounted PV on soils
- New ideas and examples in the field of preventive soil protection
- Integrate the topic of soil more into awareness-raising and information measures
- Land conservation managers are another building block in soil protection
- Soil conservationists unite: Land conservation managers, agricultural administration, water management, ...
- Soil protection is not the same as nature conservation
- Soil is more complex than you might think. Soil is alive!
- Soil protection as an equal specialist area in planning
- What is in/behind soil maps
- Hope



Interested in continuing the exchange between the specialist departments? Any ideas?

- How can soil protection be brought into the communities?

- Concrete further cooperation / further cooperation is worthwhile
- Cooperation in updating regional plans (climate protection, agriculture, etc.)
- Networking is incredibly important in order to speak with one voice
- Continuation yes, format still unclear
- Specific contact persons for the governments to enable case-specific exchange / seek contact with regional representatives



Which topics have remained open, which would I like to talk about in the future?

- Discuss "sharp swords" (legal requirements)
- How much can you be an "advocate" for the soil → Little basis in the LEP
- Weighting of soil protection concerns when saving land
- Standards for consideration in state/regional planning
- Communicate the topic of soil functions to local decision-makers

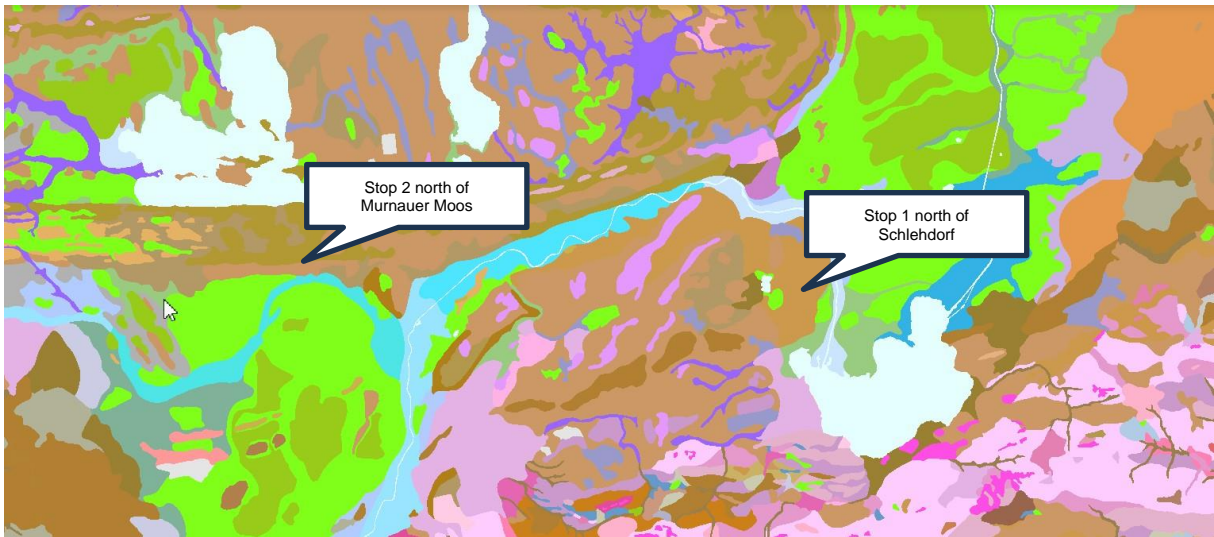
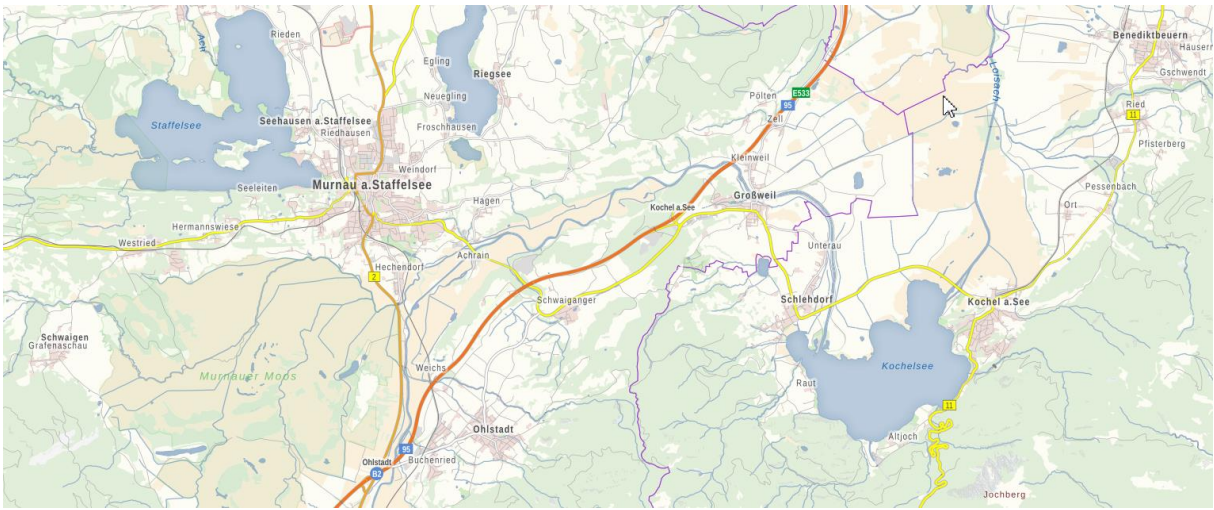
Tuesday, 02.07.2024, 08:30 - 12:30 a.m.

Excursion "Soils in the landscape"

Dr. Traidl (LfU) explained the history of the landscape's formation, its glacial influence and soil genesis on the journey from Benediktbeuern via Schlehdorf to Murnau with stops north of Schlehdorf¹ and north of the Murnauer Moos. Various soil profiles were used to explain the soil approach in the context of soil mapping and the challenges involved in creating comprehensive soil maps.



¹ 2 Information on the aforementioned subsequent use of the former Schlehdorf monastery by Wogeno eG can be found at this link from the Zukunft Kulturraum Kloster initiative for the transformation of former monasteries: <https://zukunftkulturraumkloster.de/de/loesungen/best-practice/wogeno-genossenschaft-ubernimmt-das-klostergebäude-in-schlehdorf>



Source: Overview soil map of Bavaria 1:25,000 ([Environmental Atlas of Bavaria](#))

Attachments

Programme

Presentation by the space-saving manager (Ms. Ziegltrum)

Presentation What is soil (Dr. Traidl)

Giving presentation soil a value (Dr. Spörlein)

Presentation Soil protection in the planning, construction and operation of open spaces PVA (Ms. Wölfel)

Programme

Time	Programme item	Speaker
13:30	Welcome, presentation of the Alpine Convention and the Spatial Planning and Soil Working Groups	Dr. Meier, BMWSB, Vera Bornemann, Permanent Secretariat of the Alpine Convention
13:45	Presentation of the space-saving manager	Ms. Ziegltrum, StMWi
14:00	What is soil?	Dr. Traidl, LfU
14:45	Questions about the presentation	
15:00	Coffee break	
15:30	How can soils be evaluated and compared? Soil functions and soil protection-relevant principles in planning	Dr. Spörlein, LfU
16:30	Soil protection in connection with ground-mounted PV systems	Ms. Wölfel, LfU
17:00 - 17:45	Questions about the presentation and space for discussion and exchange	Plenum

02.07.2024, 08:30 - 12:30

Excursion "Soils in the landscape"