

The changing face of land use

Land use statistics of Switzerland



Editorial Contents



Statistical observation of land use in Switzerland was initiated at the beginning of the 20th century and was followed by other work in 1923/24, 1952 and 1972. However, it was not until the early 1980s that the SFSO incorporated **ongoing observation** of land use development into its statistical programme, using a scientifically based method which provided results that were comparable over time.

Information about land use is of prime importance for our society which, during the 20th century, developed at a prodigious rate unparalleled in the history of mankind, experiencing a radical transformation affecting all its structures. Land, as the medium for many human activities, was of course in great demand. Economic and demographic growth, the concentration of human activity, increased mobility and the rationalization of agriculture – to name but a few factors – triggered land use unlike any observed in the past. Because land is not an inexhaustible or renewable resource, it is an extremely valuable com-

modity whose future concerns each and every one of us. The State, as the guarantor of national assets, is duty bound to promote a policy that ensures the harmonious development of occupation of the national territory. And to do so, it has to have the information needed **to monitor spatial utilization**. Only a statistical system for observing the national territory can enable it to achieve this aim, in the interests of the Nation as a whole. But policy-making is not the sole prerogative of the State: in the Swiss system of democracy, citizens have the gratifying privilege of being able to contribute to the shaping of public opinion. And to exercise this privilege, they have to have the appropriate information. That is why we felt it was indispensable to brief a wider public on the data collected about the crucial, sensitive topic of **land use and how it is changing**. We trust that, once they are conscious of the changes observed, our readers will realize just what is at stake when it comes to designing a land development policy that is in the best interests of society as a whole.

Carlo Malaguerra, SFSO Director

An overview of changing land use

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How Swiss land use statistics are compiled

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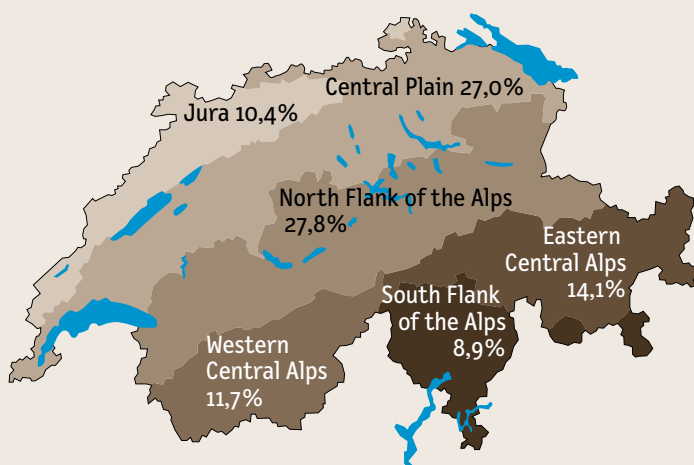
Constructing a bridge between Dangio and Torre (TI): transportation accounts for just under one third of settlement and urban areas.

Intensive construction

On average, almost 400 square metres of settlement area are available to every inhabitant of Switzerland. Within just twelve years, this use has increased nationwide by 327 square kilometres in all. In other words, the newly developed area is larger than the surface area of the Canton of Schaffhausen.

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Biogeographical regions of Switzerland and their percentage areas



The regions of Switzerland

Switzerland has a great variety of different landscapes and habitats, with the Alps as the distinctive dividing line. Similarly, its flora and fauna also vary with the climate, topography and soil composition. On the basis of the typical fauna and flora populations of certain regions, their respective habitats can be demarcated. The Swiss Agency for the Environment, Forests and Landscape (SAEFL) has therefore sub-divided Switzerland into bio-geographical regions for nature conservation purposes.

Because this new regionalization model is also suitable for illustrating regional differences in land use development, key land use statistical findings are presented according to these regions. However, it is also possible to analyze them in terms of administrative or economic criteria, as is frequently done for statistical purposes.



Building of one-family houses in Gams (SG). Expanding settlements explain two thirds of agricultural land losses.

Less and less agricultural land

While farming land still accounts for the bulk of land use in Switzerland in terms of area, agriculture continues to literally lose ground. Over the past 12 years, agricultural land has shrunk by 482 square kilometres. In flat locations, it has given way mainly to new settlement areas, while forests have replaced it in steep and remote regions.

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Woods are gradually re-establishing themselves where mountain farming is on the retreat, in this instance in Liddes (VS).

Advancing forests

Tree and bush land is benefitting from agriculture's withdrawal from marginal areas, with the result that new trees have grown on 170 square kilometres of land, the majority of them with no human intervention. This corresponds to an area the size of the Canton of Appenzel Innerrhoden.

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Balanced results for unproductive areas

Avalanches, thaws, floods and rockslides are continually changing the face of the alpine landscape, with natural forces balancing each other out when it comes to unproductive areas. Their reduction (15 square kilometres less) represents just 1.5 thousandths.

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Flood damage in Ronco in (Bedretto, TI): natural processes leave their stamp on unproductive areas.

Future land use perspectives

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Applications for Swiss land use statistics

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The 4 main categories of land use

Total area of Switzerland: 4 128 476 ha



Settlement and urban areas:
279 095 ha



Wooded areas:
1 271 645 ha

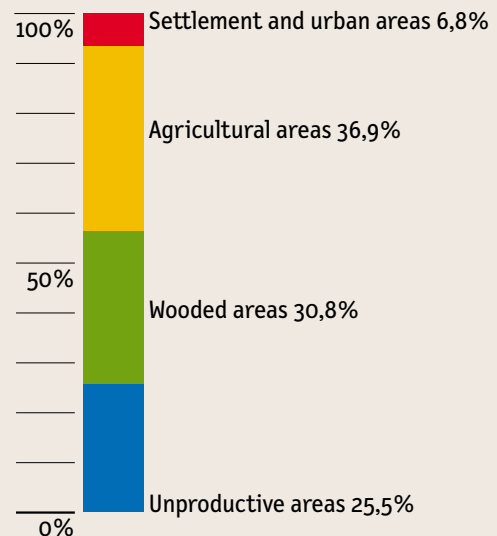


Agricultural areas:
1 525 119 ha



Unproductive areas:
1 052 617 ha

Main categories as a percentage of the total area of Switzerland Status 1992/97



The changing face of land use in Switzerland

Major findings

Eleven hectares of agricultural land disappear in Switzerland every day – ie. nearly 1.3 square metres per second. Approximately two thirds are used for new settlements, especially in the Central Plain, while the rest consists mainly of abandoned meadows and pastures on which woods are gradually (re-)establishing themselves.

Concentration on a confined area

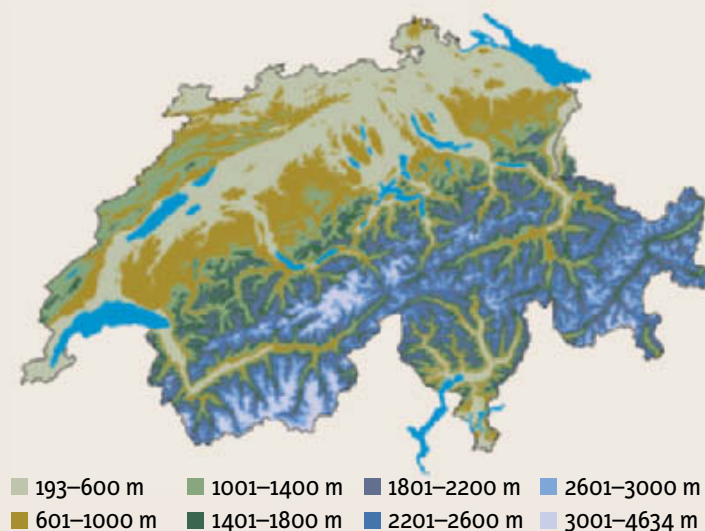
With a territory of just under 41 285 square kilometres, Switzerland is one of the smaller countries in Western Europe. Its landscape is characterized by the Alps which restrict opportunities for land use on much of this territory. Consequently, the fairly flat Central Plain – the country's most productive ecological region – accounts for just 27% of Switzerland's total area. Sandwiched between the Jura mountains and the foothills of the Alps, this plain is a strip between 50 and 100 kilometres wide, stretching from Lake Geneva north-eastwards as far as Lake Constance.

Competition for the best land

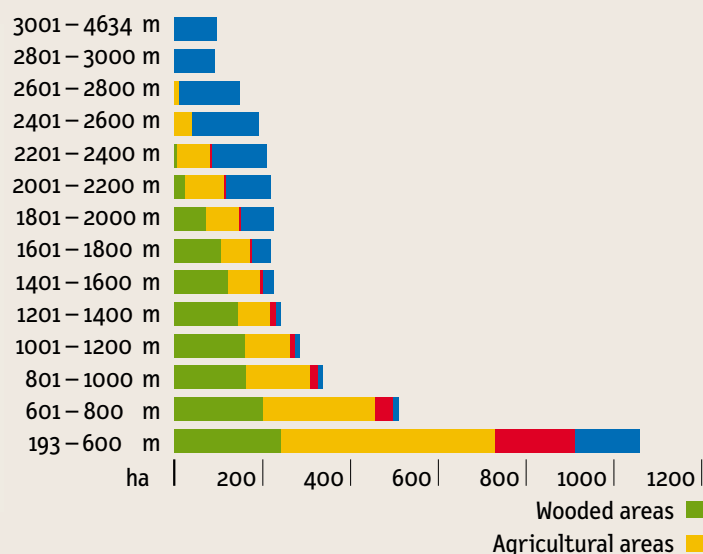
In this confined space, expanding settlements compete with agriculture for the best land. All Switzerland's larger towns with more than 50 000 inhabitants, its industrial production centres, many important service operations as well as the main axes of road and rail and the airports are concentrated in the Swiss Central Plain. Thus, nowhere else in Switzerland is human intervention so obvious when it comes to

Building a school in Murten (FR): spreading settlement areas are agriculture's main rival for land in prime valley locations.

Altitude levels in Switzerland



Land use by altitude level in 1000 hectares



- > Concentration on a confined area
- > Competition for the best land



Arable farming area near Rebeuvelier (JU).



Forest landscape in the Malcantone (TI).



Rhone delta near Villeneuve (VD).



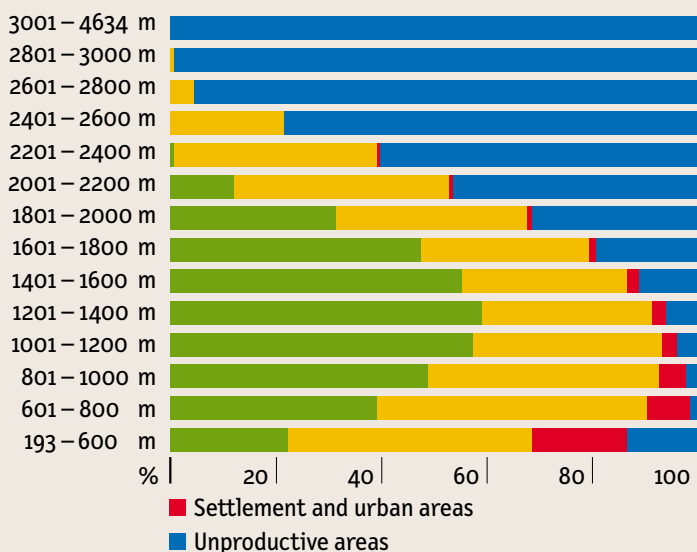
Urban settlement in the Central Plain (Biel/Bienne, BE).

land use and the look of the landscape as in the Central Plain. At 16.2%, the ratio of settlement to productive areas, which include farming land and forests as well is more

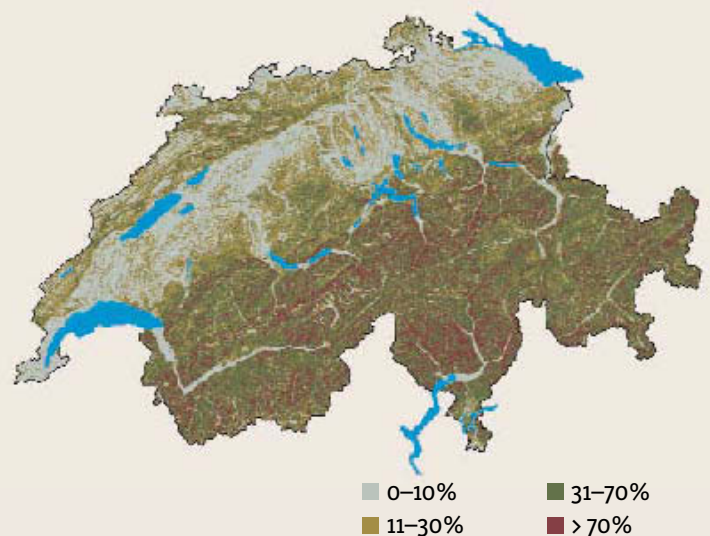
than double compared to all other regions, making the Swiss Central Plain one of Europe's most densely populated areas. At one time, extensive forests of deciduous

trees were the dominant feature of this landscape, but over the centuries, these were cut back to just 25.5% of the productive area, to make way for additional farm-

Share of main land use categories by altitude level



Gradient classes of Switzerland



Major findings



Hilly Central Swiss landscape near Unterägeri (ZG).



Alpine foothills beside the Schwarzsee (Plaffeien, FR).



Scattered settlements dominated by tourism near Nendaz (VS).

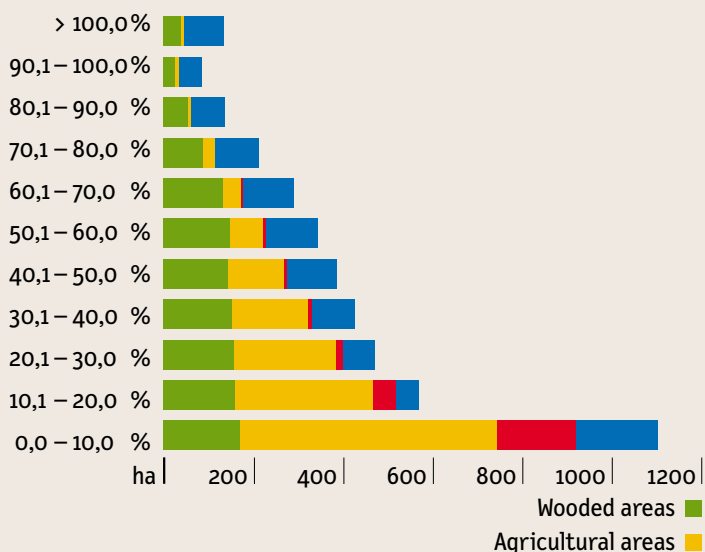


Alpine farming on the Monte Laura mountain meadow in Roveredo (GR).

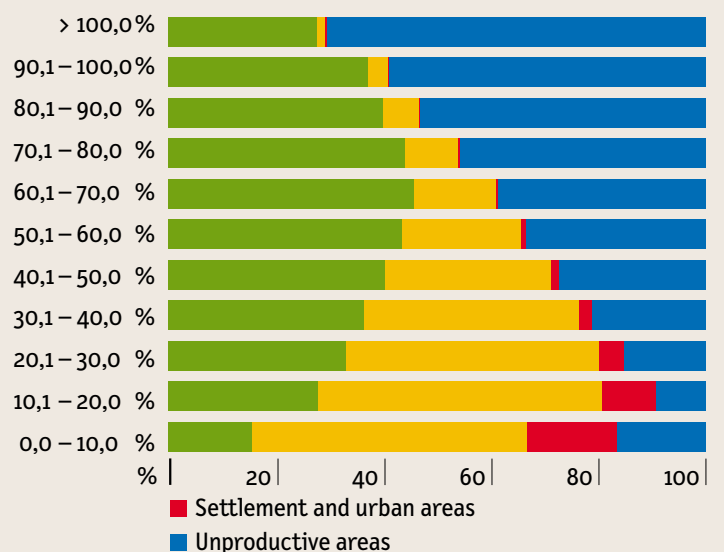
ing land and residential areas for a growing population. However, because legislation has protected the forests for more than a

century, since then virtually all settlement growth goes at the expense of agricultural land.

Land use by gradient class
in 1000 hectares



Share of main land use categories
by gradient class





Farming land is reverting to fallow land near Leiggern (Ausserberg, VS).



Transit axis in the narrow Reuss Valley, near Wassen (UR).

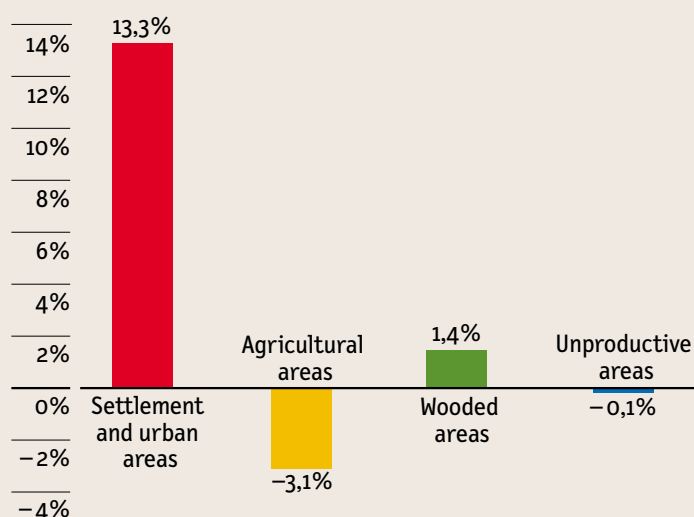
Agriculture as the big loser

Thanks to the 1992/97 survey and for the first time since land use statistics began, there are now two geospatially and chronologically comparable datasets for such statistics available. For the twelve-year period covered, these permit precise statements about the development of land use and show that, during this time, agriculture lost 482 square kilometres (or 3,1%) of its usable land. Eleven hectares of agricultural land are lost in Switzerland every day, an area corresponding to the size of a small farm. Roughly two thirds of this area are used for new settlement and urban purposes. These areas lost consist mainly of fertile

pastures, arable land and field fruit trees in flat, valley locations which are particularly suitable for cultivation. The remaining farming land lost is mainly in steep, remote areas, where new woods start growing on unused meadows and pastures. In this way, the structural change in mountain farming and the resultant exodus from marginal economic areas is gradually changing the look of the landscape, with wooded areas being the main winners (gaining 170 square kilometres or 1,4%).

Human activity with regard to settlements is far more dynamic than nature: settlement areas have grown a staggering 327 square kilometres (or 13,3%) within twelve years.

Evolution of main categories of land use 1979/85 – 1992/97



Key comparative statistics at a glance

- Between 1985 and 1995, Switzerland's resident population rose by 570 300 to almost 7 040 700. This 8,8% increase roughly corresponds to the total population of the four cities Geneva, Lausanne, Bern and Basel. (Source: SFSO, ESPOP)
- In 1995, Switzerland had more than 3 389 900 dwellings – almost 464 800, or 15,9%, more than ten years earlier. (Source: SFSO, Housing Construction Statistics)
- In 1995, 4 120 900 motor vehicles were registered – 78,4% of them private cars. Compared with 1985, the total number of vehicles has risen by roughly 899 300 vehicles, or 27,9%. (Source: SFSO, Transport Statistics)
- Between 1985 and 1996, the number of Swiss farms fell from 98 760 to 79 480, a decrease of 19,5%. Over the same period, the number of people employed in agriculture fell by 25,1%. (Source: SFSO, Farm Census)

Switzerland under the stereoscope

How are land use statistics prepared?

Swiss land use statistics are based on a detailed analysis of land cover and land use derived from aerial photographs. For each hectare of Swiss land, a specific point is investigated and assigned to one of 74 categories.



A bird's eye view

A Federal Office of Topography aircraft equipped with special cameras regularly covers the entire surface of Switzerland with aerial photographs taken from an altitude of about 5000 metres. This Office requires black-and-white photos to periodically update its national maps and organizes flights covering one sixth of Switzerland every year.

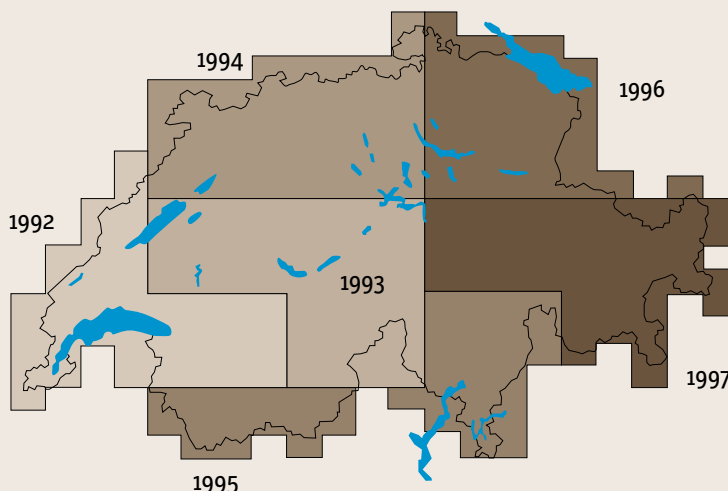
The SFSO's land use statistics are also based on these photographs. The years given for the latest 1992/97 survey reflect the six-year flight cycle. Thus, for example, the pictures for the Geneva region document the 1992 situation, while those for the Grisons, the last canton to be overflown, show land use in 1997.

Federal Office of Topography aircraft.

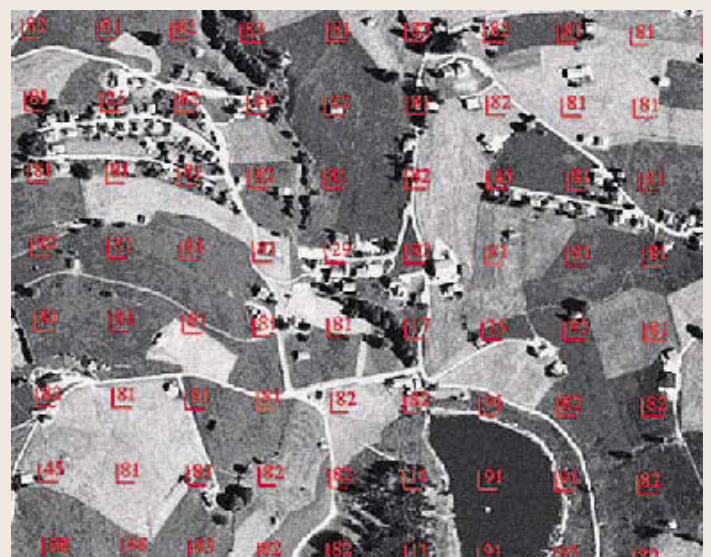


Aerial camera.

Flight years of aerial photos used



Aerial photograph with network of sample points and land use codes



- > A bird's eye view
- > More than 4,1 million sample points
- > Regionally differentiated results

More than 4,1 million sample points

The SFSO overlays the nearly 2900 aerial photographs with transparent sheets featuring a 100x100-metre grid of regularly spaced sample points. For each hectare, the land cover is determined at the intersection of the 100-metre coordinates and assigned to one of 74 possible categories using a two-digit code. Depending on the degree of analytical detail required, these can later be aggregated to a hierarchical series of standard land use classes, starting from the four main categories, or to a variety of different task-specific classes. The most detailed differentiation featuring 37 categories is provided for settlement and urban areas. Thus, the three categories "railway station grounds", "railway lines" and "green railway environs" make up the railway area as a whole, and it in turn is combined with road and air-port areas to make up the next highest hierarchical level of transportation areas.

In assessing settlement areas and land used for agricultural purposes, the emphasis is on function, while the SFSO classifies wooded and unproductive areas by their respective land cover. A stereoscope which permits a three-dimensional observation of the aerial photos is used for interpretation purposes. This method also permits to identify the inclination of the surface, morphological structures and edges as well as the heights of trees and buildings. To eliminate errors wherever possible, each of the 4.1 million sample points is checked by a second person. Any discrepancies are clarified within the study team, and uses which are hard to identify or remain unclear are assigned after a field inspection.

Regionally differentiated results

Once the transparencies have a complete and verified coverage of land use codes, they are entered into the geographical

information system of GEOSTAT. Because the same principle was used for the 1979/85 survey, changes in use can be pinpointed for each point investigated. For instance, the latest land use statistics show a shift within the 74 categories for 5,2% of all sample points. The fine-meshed grid permits a wide variety of analyses with detailed results about the status and development of land use in Switzerland, both by standard administrative units, right down to communal level, and by arbitrary spatial subdivisions, such as river catchment areas or wetlands. The tremendous progress which has been made in electronic data processing opens up a wide variety of analysis options and applications, particularly in conjunction with other spatial information.



Orientation of aerial photographs with a comparator.



Engraving sample points on transparent sheets.



Interpretation under a stereoscope.

Landsat – 5 satellite



Remote sensing by satellite

Depending on the utilization category, land use statistical data can be further differentiated with the help of satellite images. One example is the varying forest composition of deciduous and coniferous trees, an indicator usually recorded in European land use statistics. Based on data taken from the Landsat-5 satellites from about 700 kilometres up in combination with its land use statistics, the SFSO has now made this information available for Switzerland also (cf. graph on page 21).

Like all other objects on the earth's surface, deciduous and coniferous trees also possess certain reflection characteristics which vary according to different wavelengths. Satellite sensors measure the reflections from the earth's surface from outer space and record the information which differs for various objects. Thereafter, the data can be represented visually and transformed into maps.

How are land use statistics prepared?

Land use by main categories

One example of this are the cartographic representations of Switzerland by each main category of land use. In isolation, the illustration of settlement areas shows how the built-up areas are concentrated near the lakes of the Central Plain, around the Alps and in the flat areas along the major rivers Rhine, Rhone and Aare. When it comes to the areas used for agriculture, which take up most space at 36,9% of total land surface area, the limited scope for expansion in the alpine region is particularly striking. The map of wooded land brings out the comparatively heavy wooding of the landscape in the Jura and south of the Alps, as well as the reduction in the area of forests in the intensively used and occupied Central Plain. Most of the unproductive areas are covered by bare rock, scree, ice and permanent snow, unproductive vegetation above the tree line, though lakes, rivers and wetlands are also included in this category.

Just one type of land use for every point

The SFSO's land use statistics are the most comprehensive, but not the only, survey of land use in Switzerland. In individual fields such as agriculture and forestry, separate area data about corresponding land utilization are collected at federal level since many years. Because the underlying issues and the survey methods sometimes differ, the findings do not always coincide with the SFSO data. These variations are partly explained by the different allocation of areas with overlapping or multiple uses. For

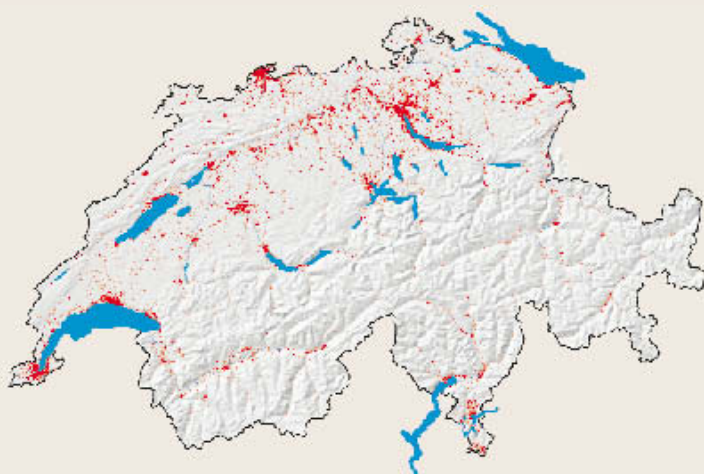
instance, agricultural statistics generally record a wood with pasture as pasture land, while the forestry inventory records the same area as forest. As part of its full area coverage, the SFSO land use statistics assign such hybrid-use areas to a single category according to clearly defined rules.



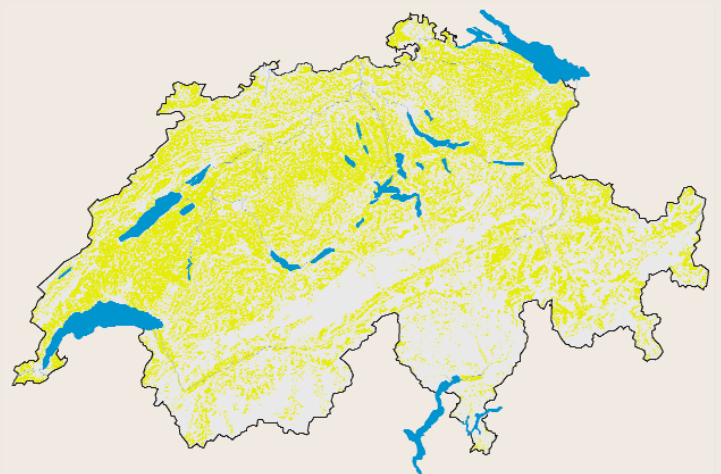
Field inspection.

Cartographic representation of land use as collected by Swiss land use statistics illustrates the spatial distribution of the various types of use.

Settlement and urban areas in Switzerland



Agricultural areas in Switzerland



- > Land use by main categories
- > Just one type of land use for every point
- > Cooperation within Europe



Harmonization of Swiss land use statistics with land cover data of the European Union allows cross-border analyses.

Cooperation within Europe

In its CORINE Programme dating from the mid-Eighties, the European Union (EU) has an environmental information system which collects data about the status of the environment in member countries using criteria that are as standardized as possible. One of its important components is the CORINE Land Cover (CLC) subproject. A total of forty-four land cover categories are identified by visual interpretation of satellite images. Despite of its coarse spatial resolution which tends to suppress small-scale spatial and environmental patterns, Switzerland is highly interested in this European data on spatial observation. Particularly for areas bordering Switzerland, CLC data constitute a valuable supplement to the SFSO's land use statistics and provide additional insights. Because most environmental issues

are of cross-border significance, the Swiss Federal Statistical Office and the Swiss Agency for the Environment, Forests and Landscape have for many years been cooperating closely with the European Environment Agency. The exchange of digital datasets on land use is one aspect of this cooperation. With the incorporation of Switzerland's land use statistics into the CORINE Land Cover system, the gap of 41 285 square kilometres in the centre of the 1997 European Land Use Map has been successfully filled. The LUCAS and CLC 2000 projects currently underway in the EU embody further efforts to standardize, enhance the precision of and update the data. Again, Switzerland is actively involved in this work.

Wooded areas in Switzerland



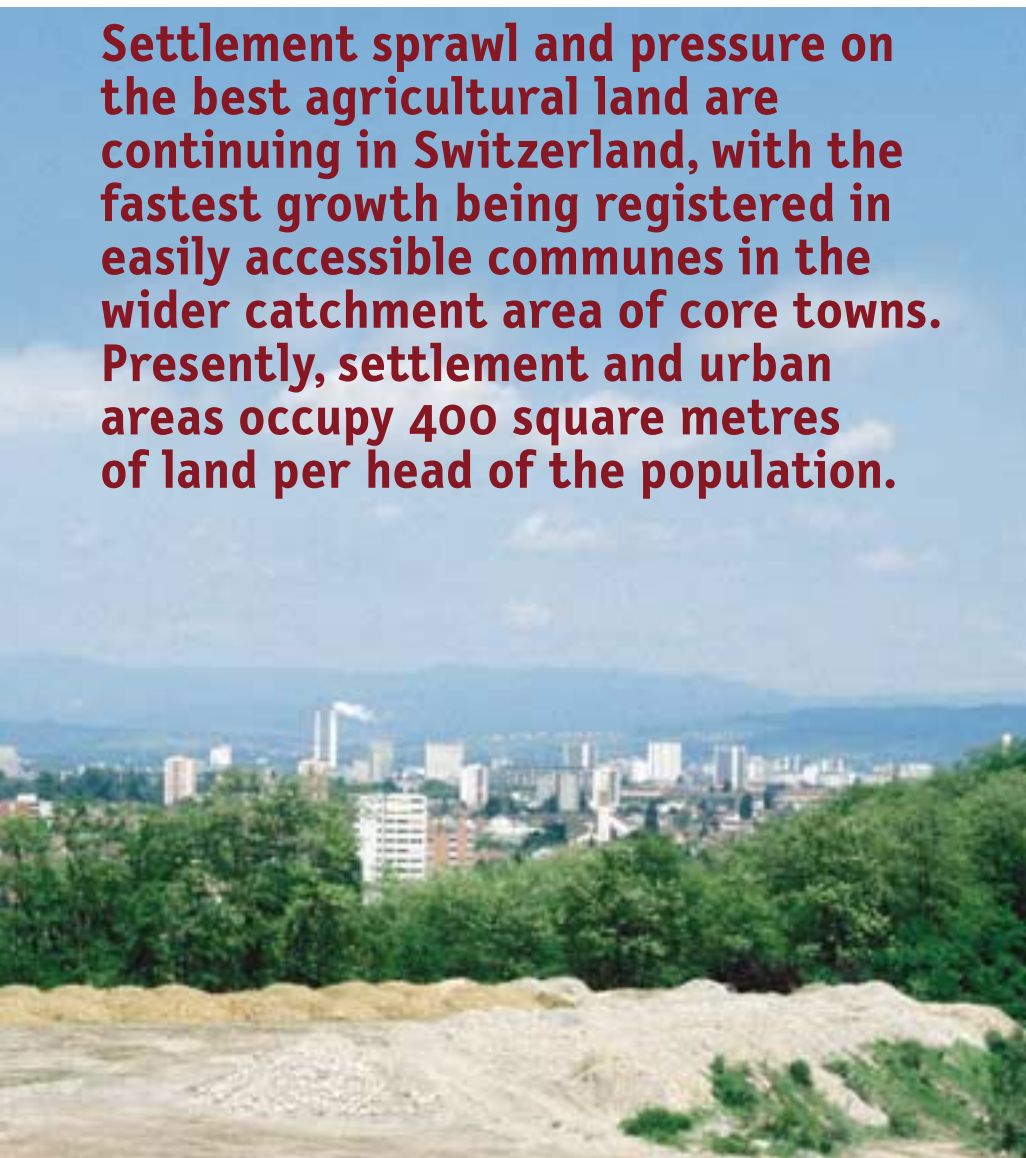
Unproductive areas in Switzerland



Continuing pressure on the countryside

Settlement and urban areas

Settlement sprawl and pressure on the best agricultural land are continuing in Switzerland, with the fastest growth being registered in easily accessible communes in the wider catchment area of core towns. Presently, settlement and urban areas occupy 400 square metres of land per head of the population.



Motorways – a source of economic prosperity

As the capital of Helvetia in Roman times, Avenches (VD) in the Broye Valley once had more than 20 000 inhabitants. Following the collapse of the Roman Empire, the town with its impressive amphitheatre lost much of its importance. However now, the section of the A1 motorway with its Avenches exit is bringing new economic prosperity to rural Canton Vaud. Important urban centres such as Bern, Neuchâtel or Lausanne which used to be fairly distant have suddenly been brought closer. In addition to attractive transport access, land prices in Avenches are quite cheap compared with those in the cities, and these advantages attracted interested companies, commuters and other immigrants even before the motorway was opened.

The 1992/97 land use survey findings for Avenches testify this rapid development. Since the last survey, the commune's settlement area has expanded by 66 hectares, or 42.6%, all of them at the expense of agricultural land. With an increase of 10 to 13 hectares, the areas covered by trans-

Dump of building debris near Allschwil (BL) with the city of Basel in the background.

Settlement and urban areas: 279 095 ha



Building areas:
137 558 ha



Special urban areas:
16 113 ha



Transportation areas:
89 331 ha

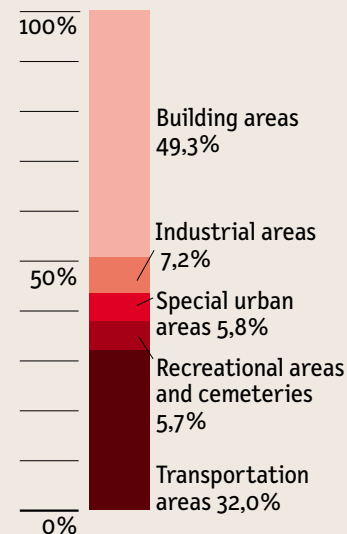


Industrial areas:
20 233 ha



Recreational areas and cemeteries:
15 860 ha

Subdivision of settlement and urban areas Status 1992/1997



- > Motorways – a source of economic prosperity
- > Substantial growth in rural areas



Strip of cleared forest near Kreuzlingen (TG): the trees have to make way for construction of the A7 motorway.

portation areas, industrial estates and construction areas as well as recreational areas and cemeteries have all expanded fairly evenly. Special urban areas – in this particular case, mainly the motorway construction sites – account for the other 21 hectares.

Substantial growth in rural areas

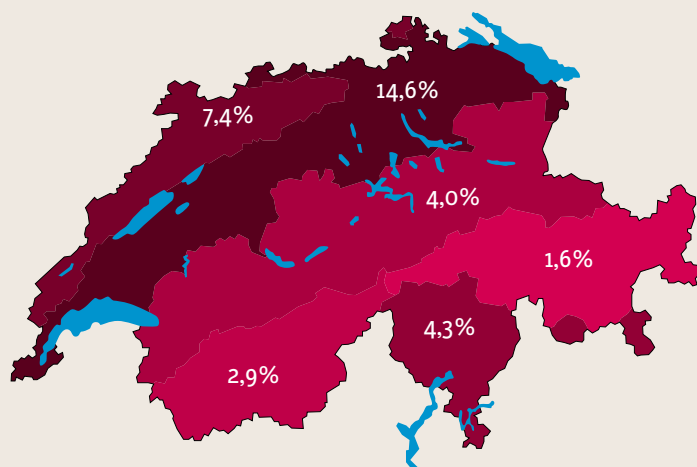
As in Avenches, the percentage area required for settlements is growing faster in many rural locations than in urban agglomerations. The accelerated development of construction in areas which have recently become accessible thanks to a good road network is typical of this trend. More and more people working in larger built-up areas have come to see “nearby” rural communes as an attractive place of



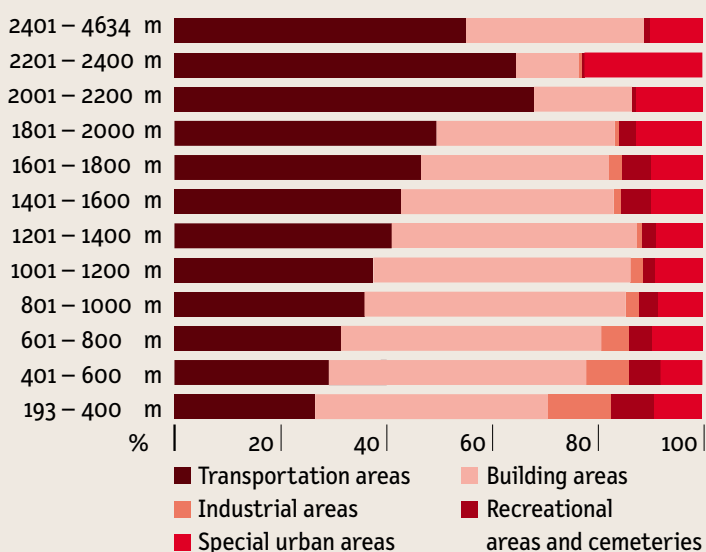
Major construction site: extension of the Unique Zurich Airport near Kloten (ZH).

residence. Besides putting distance between themselves and the social, economic and ecological problems of urban areas, commuters generally find cheap building land and a quiet location there, with the result that 57% of the new area of one-family houses has been created in rural communes. Statistics on newly built flats also confirm this trend of living outside core towns, with two thirds of such developments being found in agglomerations and one third in rural areas.

Settlement and urban areas as a percentage of the total area by biogeographical region



Share of settlement and urban categories by altitude levels



Settlement and urban areas

Increasing surfaces for residential purposes

At 786 square kilometres, buildings used exclusively for residential purposes and their environs now occupy a good 28% of Switzerland's total settlement and urban area. Within twelve years, this type of use has grown by no less than 25,4%, exceeding the average growth rate for settlement and urban areas (13,3%) almost twice over. The additional space required cannot be adequately explained by a population increase of roughly 9%. After several years of recession in the Nineties, per capita space demands have rocketed once more. The explanation lies in the growing number of small households as well as the fact that one- and two-family houses account for 63,4% of the newly created residential area. Including the buildings and their surroundings, every person currently occupies an average of 112 square metres of dwelling space proper.

397 square metres of settlement and urban areas per person

Mainly because of the growth trend for residential areas, overall per capita land consumption for settlement purposes has risen from 382 to 397 square metres. Admittedly, there are considerable regional differences, with cantonal means ranging



Semi-detached houses in Port-Valais (VS): not all settlement areas are sealed. In addition to the buildings, their environs are also included.

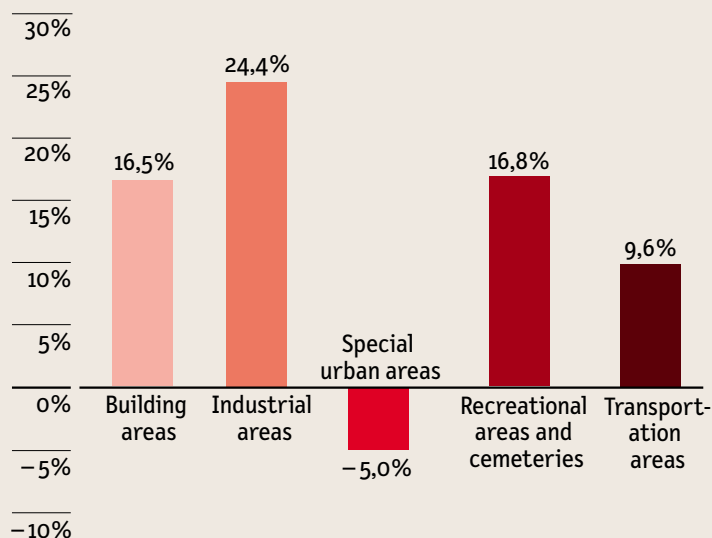
between 131 and 711 square metres. Thus, on average, people in urban areas with a higher settlement density and a spatially concentrated infrastructure take up significantly less settlement area.

For Switzerland as a whole, only transportation requires more space than dwellings – namely 127 square metres per person, 89% of it just for roads. Because Switzerland's transportation infrastructure is extensively developed, growth has since slowed to 9,6%, slightly reducing transportation areas' share of settlement areas. The opposite applies to industrial land requirements which, at 24,4%, chalked up above-average growth despite years of economic recession. Many older and larger industrial areas were, however, not in use at the time of the survey, but will only be available for other purposes after protracted planning processes.

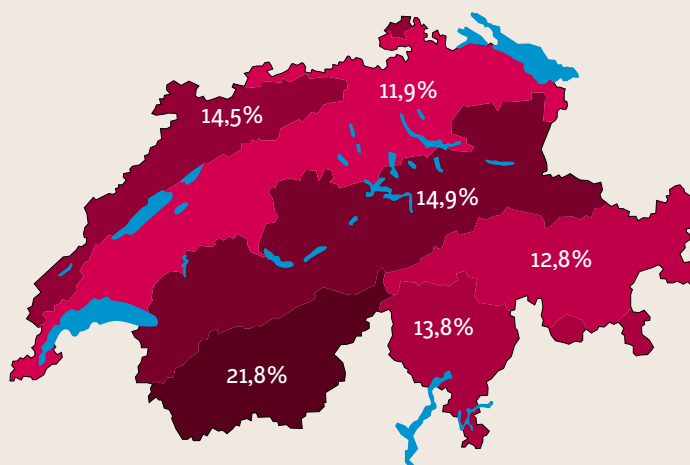
Maximum share of land occupation in the Central Plain

The development is particularly striking in the confined space of the Central Plain where the increase is twice the national average, up from 13,0% to 14,6% of the total area. No less than 58,2% of Switzerland's settlement areas are concentrated here, on just 27% of the national territory. In the twelve years since the last Land Use Statistics alone, 172 square kilometres of new settlement areas have been created in the Central Plain, corresponding to an area one and a half times the size of Lake Lucerne.

Evolution of settlement and urban areas by type of use
1979/85 – 1992/97



Evolution of settlement and urban areas
by biogeographical region 1979/85 – 1992/97



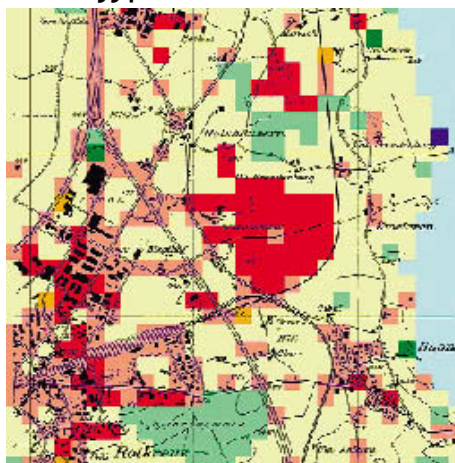
- > Increasing surfaces for residential purposes
- > 397 square metres of settlement and urban areas per person
- > Maximum share of land occupation in the Central Plain
- > Booming settlement development

Status 1982:

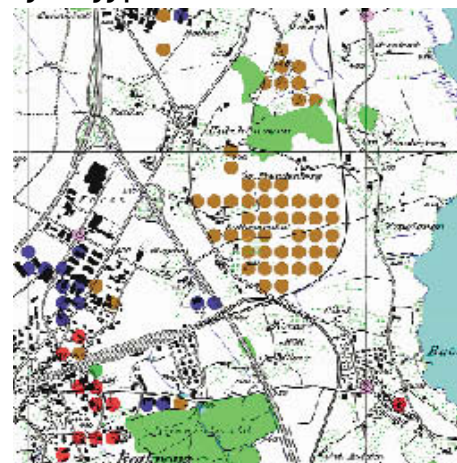


- Wooded areas
- Agricultural areas
- Settlement and urban areas
- Unproductive areas

Status 1994:



- New wooded areas
- New agricultural areas
- new settlement and urban areas
- New unproductive areas

New settlement and urban areas
1982–1994:

- Building areas
- Industrial areas
- Transportation areas
- Special urban areas
- Recreational areas and cemeteries

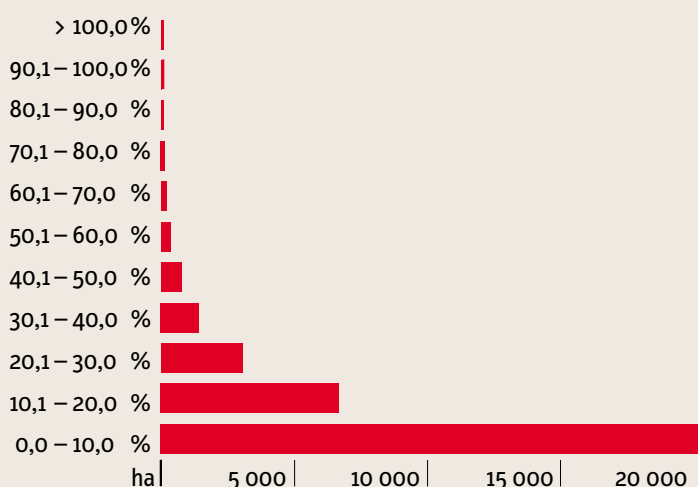
Booming settlement development: an example

The creation of the A4/A14 highway junction in the mid eighties near Rotkreuz (ZG), on the western shore of Lake Zug, considerably boosted its locational potential for economic investments and residential developments. A chronological comparison of land use statistical analyses shows, above-average growth was recorded in the settlement areas of the communes concerned between 1982 and 1994 – with a growth rate of 36,1% in Risch and around 18,8% in Hünenberg. The main driving force behind this development was the area's enhanced attraction as an economic location. As a result, the number of companies and jobs in industry and services in both communes more than doubled overall, with the creation of more than 400 businesses and

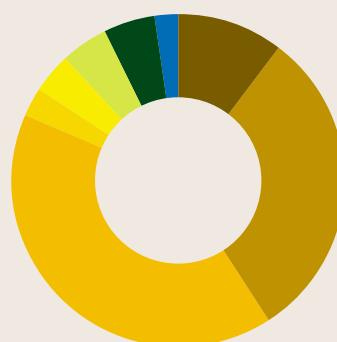
almost 3900 new jobs. This boom automatically affected population development. In the mid-Nineties, some 11 800 people lived in Risch and Hünenberg – 3100 (or just under 36%) more than ten years earlier.

The region's dynamic development and its easy accessibility also attracts additional leisure facilities. A large golf course now occupies the former Kathrinenhof farm. The area in the middle of the map is classified as a special urban area in the category break-down because the course was under construction when the aerial survey was carried out.

Increase in settlement and urban areas
by gradient class 1979/85 – 1992/97



Origin of new settlement and urban areas



- New settlement and urban areas derived from:
- 10,3% orchards, vineyards, horticulture
 - 30,6% favourable arable land and meadows
 - 40,6% other arable land and meadows
 - 2,8% farm pastures
 - 3,9% alpine agricultural areas
 - 4,6% woods
 - 5,0% forest
 - 2,3% unproductive areas

Agriculture continues to lose ground

Agricultural areas

Within 12 years, agriculture lost 482 square kilometres of farming land, almost 62% of it to new settlements, and mostly in prime valley locations. Mountain region losses concern virtually unused and abandoned alpine areas which become unproductive or wooded areas.



Farmers leave their stamp on the landscape

Despite growing pressure from settlements, the appearance of many parts of Switzerland is still characterized by agriculture. This applies in particular to the Jura region, the foothills of the Alps, all major alpine valleys and – far from the main built-up areas – to the Central Plain as well. Different methods for farming the soil, which are generally ideally adapted to the various climatic and topographical conditions, give the landscape its special character and the region its individual features. With a share of 15 251 square kilometres or 36,9% of Switzerland's national territory, agricultural land is still the predominant use of land, despite the 3,1% reduction in area recorded nationwide since the last survey.

Unsolved conflicts of interests in flat areas

In easily accessible areas, there are conflicts of interest between many potential uses of land, which is in short supply. Fast-expanding settlement areas in the form of industrial estates and commercial sites,

Pasture between marker poles indicating a planned construction in Fischenthal (ZH).

Agricultural areas:
1 525 119 ha



Orchards, vineyards,
horticulture: 60 952 ha

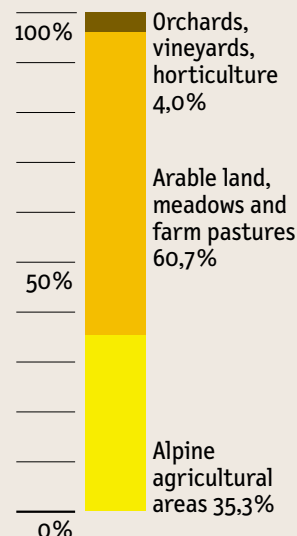


Alpine agricultural areas:
537 801 ha



Arable land, meadows
and farm pastures: 926 366 ha

Subdivision of agricultural areas
Status 1992/97



What is regarded as agricultural land?

Within the meaning of the Swiss land use statistics, agricultural areas also cover alpine agricultural areas but exclude woods and tree clusters on agricultural land. In particular, they should not be equated with the definition for "agricultural areas (LN)" used in the Agricultural Terminology Ordinance.

- > Farmers leave their stamp on the landscape
- > Unsolved conflicts of interests in flat areas
- > Opposite trend in mountain regions



Alpine farming – as near Mürren in the Bernese Oberland in Lauterbrunnen – characterizes the typical look of Swiss mountain regions.

Farmers making hay in the Bergell commune of Castasegna (GR).

shopping malls and retail outlets, leisure facilities or transportation infrastructure are all competing with agriculture for land, especially in prime Central Plain locations. Because forested areas are protected by law, any expansion of settlement areas goes to the expense of agricultural land. As a result, the decrease in flat areas and valleys totals 303 square kilometres, 63% of total agricultural area losses. Of this, 285 square kilometres (or 94%) have been used for settlement purposes, with new building areas definitely accounting for the lion's share.

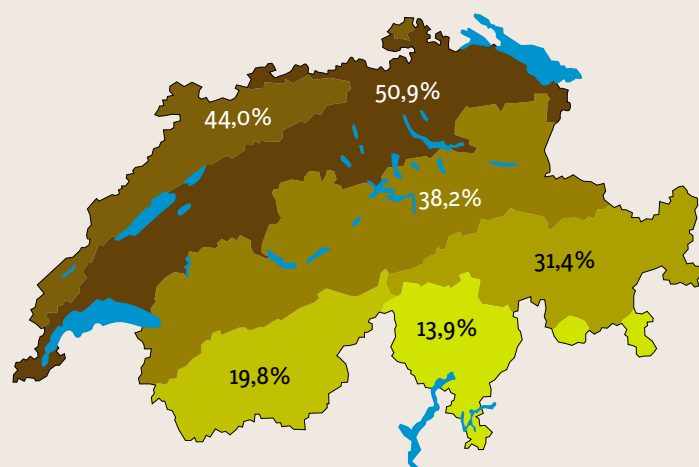
Opposite trend in mountain regions

Whereas there is competition for land in prime locations, large mountain areas – both north and south of the Alps – cease to be used productively to a greater or lesser degree. Mountain agriculture accounts for 5378 square kilometers, ie 35,3%, of all agricultural land. Withdrawal from mountain areas does not generally involve a conscious intention to use the land for other purposes. In particular, less accessible and hard-to-farm rocky areas – roughly 179

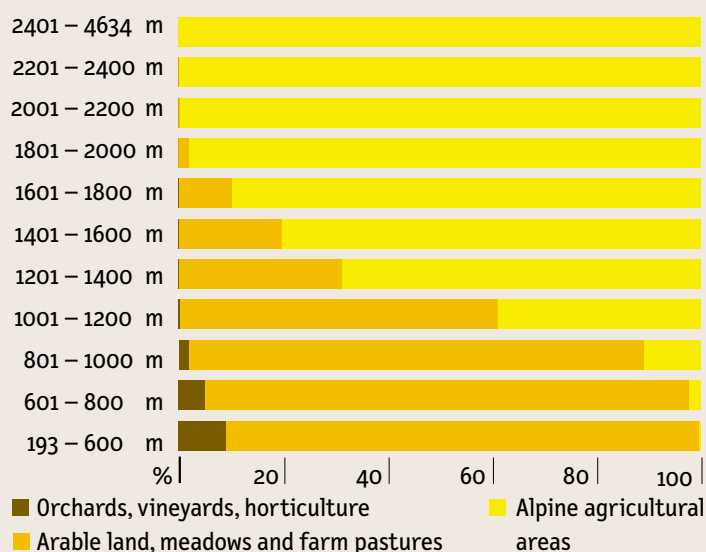
square kilometres, according to the land use statistics – have been totally abandoned, accounting for 37% of all agricultural land losses.

Forest, woods, brush and bushes are now growing on 81% of abandoned alpine meadows and pastures, bringing a fresh increase in biodiversity as agricultural diversity is lost.

Agricultural areas as a percentage of the total area by biogeographical region



Share of agricultural categories by altitude level



Agricultural areas

Reshaping of the agricultural landscape

As a result of the far-reaching structural change, the percentage of people employed in agriculture has dropped from 31% to 4,7% since 1900. Between 1985 and 1996 alone, almost 19'300 farms (= 19,5%) disappeared, leaving the remaining operations to farm bigger and bigger areas. The trend towards rationalization and intensification of agriculture has radically altered the agricultural landscape in recent decades, above all in top Central Plain locations.

Through the constitutional article in effect since 1996, the Swiss government is now striving for agriculture which is as ecological as possible and which promotes sustainable land management. This article stipulates that farmers should not only produce reasonably priced food but that their work should also maintain the natural basis of life, cultivate a typical, regional agricultural landscape and contribute to the decentralized settlement of rural areas. In return, the government compensates farmers in the form of direct payments for their general economic – and more particularly ecological – services in the interests of society as a whole.

The impact of this new agricultural policy line on the various categories of farm land use will be reflected in future land use statistics. To date, the findings point to fairly contradictory developments. For instance,



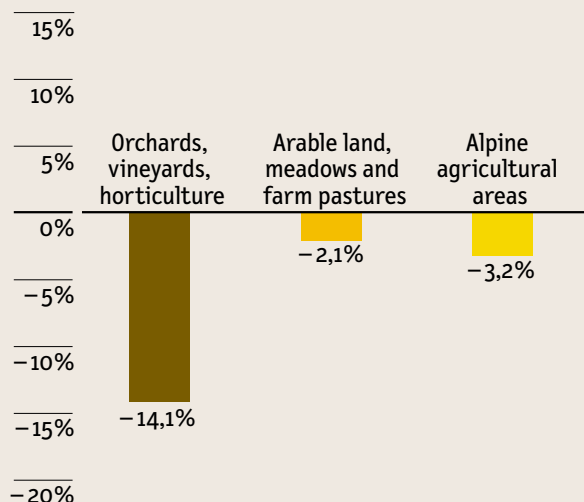
Hilly moraines in Central Switzerland near Neuheim (ZG).

as regards arable land and meadows, there has been a slight shift towards extensively managed pastures. At the same time, there has been a marked increase in intensively farmed areas with high added value, such as vineyards and horticulture.

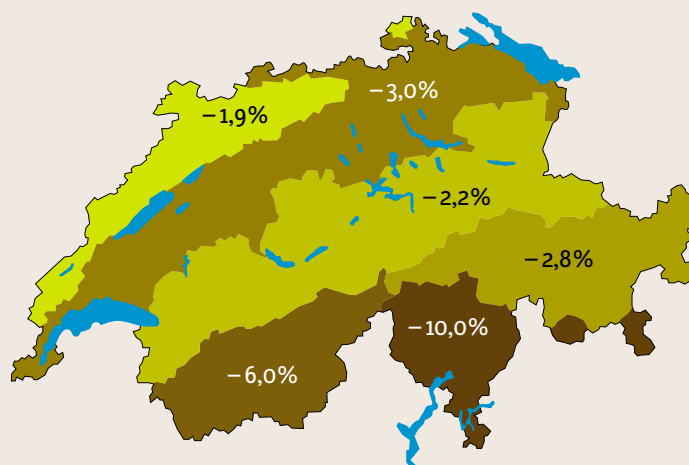


The ruins of the Monte di Cima mountain meadows near Menzonio (TI) testify to the decline of alpine farming.

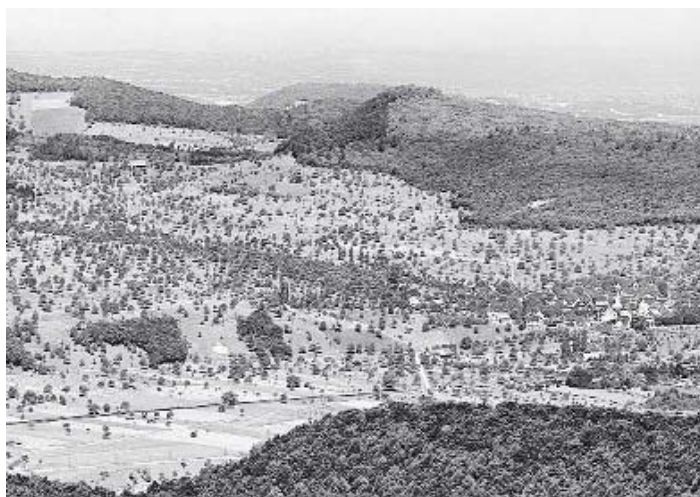
Evolution of agricultural areas by type of use 1979/85 – 1992/97



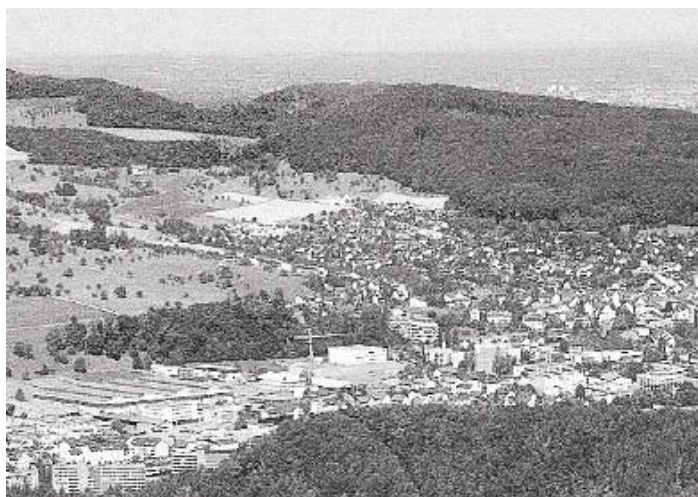
Evolution of agricultural areas by biogeographical region 1979/85 – 1992/97



- > Reshaping of the agricultural landscape
- > Disappearing field fruit trees



1909: Field fruit trees were a predominant feature of the landscape round Frenkendorf (BL).



1999: For the benefit of rationalized agriculture and settlement growth most of the tall fruit trees have disappeared.

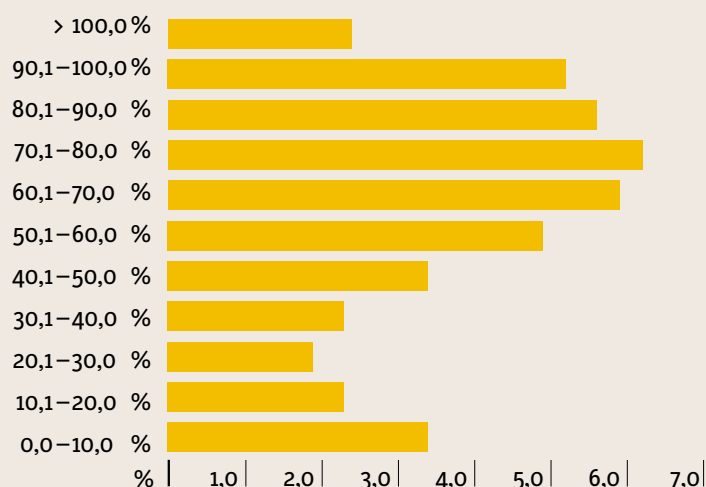
Disappearing field fruit trees: an example

With a surface area of just under 332 square kilometres, field fruit trees represent only about 2.2% of agricultural areas. However, just as the even smaller area occupied by vineyards can determine the character of a whole region – for instance in the Canton of Valais or around Lake Geneva – extensive full-size tree orchards characterize the agricultural landscape around many traditional country villages. Over the last 50 years, however, the number of work-intensive field fruit trees in Switzerland has dropped by 75%. When farmers intensify and rationalize their operations, the tall apple and cherry trees are frequently an obstacle to mechanized farming. Another explanation for their mass felling in major fruit-growing areas is that the trees are located on the fringes of villages where most construction occurs. Within twelve years, more than 11 500 hectares, or no

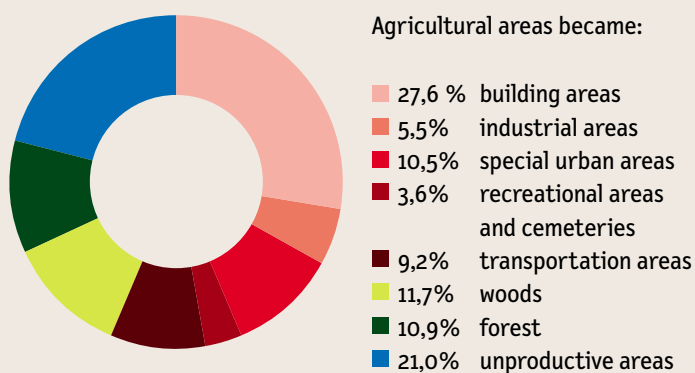
less than 25,8% of all field fruit tree areas, were lost. While 73,5% of these cleared areas are still used for agriculture, new settlement areas sprang up on 25,6% of them.

Frenkendorf (BL) typifies this development. Land use statistics show that, between 1982 and 1994, field fruit tree cultivation plummeted 50%, from 42 to 21 hectares. The losses are divided almost evenly over new settlement areas and additional arable land, meadows and pastures. According to the federal fruit-tree census, some 1200 field fruit trees disappeared in the commune during the Eighties, and with them ecologically valuable habitats for many different bird species.

Decrease in areas used for agriculture
by gradient class 1979/85 – 1992/97



Development of agricultural areas
1979/85 – 1992/97



The forest is regaining lost ground

Wooded areas

Day in day out, new forests the size of five football fields are emerging in Switzerland. Mainly in alpine areas, nature is reclaiming what mountain farmers once won from it through backbreaking land clearance. Man is not involved in the development of 86,8% of the new wooded areas.

More forests despite natural disasters

Natural disasters such as the hurricanes Vivian (1990) and Lothar (1999) or the series of avalanches in February 1999 have dealt Swiss forests harsh blows over the past decade. Lothar, for instance, caused some 46'000 hectares of damage, uprooting and breaking over 10 million trees. Within minutes, whole woods which had taken decades to grow were wiped out. The force of this destruction is typical for sudden natural events such as storms, avalanches or forest fires.

In contrast, the slow process of natural reforestation tends to escape people's notice. Despite considerable damage to forests at local level, which calls for comprehensive measures to protect settlement and traffic ways (especially in mountain regions), the wooded area recorded in the land use statistics is not decreasing. As a general rule, damaged areas are reforested, with the result that they continue to be classified as woods in these statistics. That is why, inter alia, the survey reveals an increase of 17'000 hectares, or 1,4%, in wooded areas within twelve years.

Natural wood growth on alpine meadows (Salouf, GR).

Wooded areas:

1 271 645 ha



Forest without brush forest:
1 102 156 ha



Woods:
108 975 ha



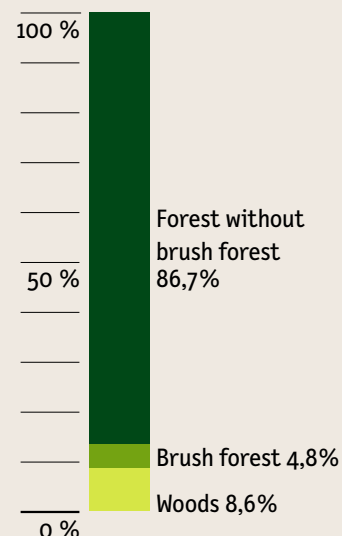
Brush forest:
60 514 ha

What is considered as forest?

Only the forest and brush forest categories are regarded as forest within the meaning of the land use statistics. Together with woods (groves, hedges, groups of trees), they constitute the major category of wooded areas.

Subdivision of wooded areas

Status 1992/97



- > More forests despite natural disasters
- > Forests often grow on steep slopes
- > Afforestation after reckless exploitation



Clearing up operations after the Vivian storm (1990) in Vals (GR). In some cantons, this natural disaster felled whole forests with protective functions, such as above Curaglia in Val Medel (GR).

Forests often grow on steep slopes

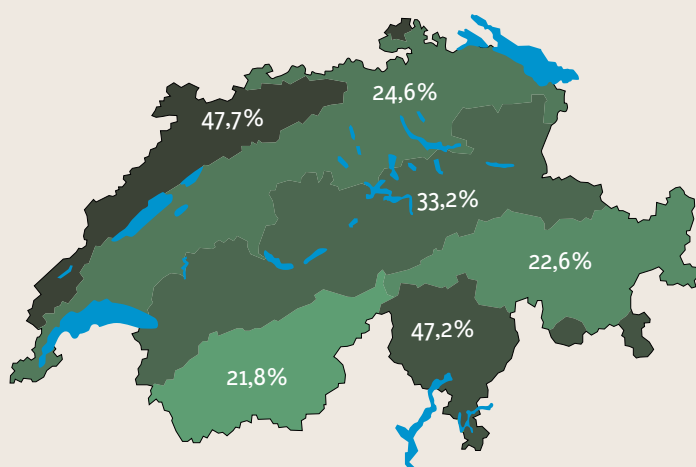
In all regions of Switzerland, the areas which are now most intensively used for settlements and farming land were once mainly wooded. Over the centuries, self-sufficiency agriculture with few natural resources forced the forests back in many places, confining them to marginal locations of little agricultural interest – often steep slopes, shady areas or damp or dry habitats. In the flatter land of the Central Plain, the alpine valleys and high plains, forests on more fertile land often had to yield to new arable land and pastures

needed by the expanding population. Thus, in the densely populated Central Plain, forests account for just 25,5% of productive areas despite the presence of ideal growing conditions, compared with 44,7% in the Jura and as much as 67,3% south of the Alps.

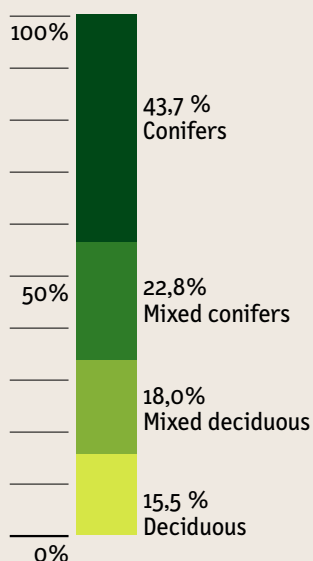
Afforestation after reckless exploitation

In the 19th century, accelerated felling of forests for firewood, construction and industry contributed to an increase in the number of extensive floods nationwide that caused horrendous damage. It was not until 1876, after experiencing repeated natural disasters, that the Swiss government instituted a ban on tree clearance and ordered large-scale afforestation of protective forests in mountain areas. This is one of the reasons that the area covered by forests, brush forests and other woods has been on the increase again in Switzerland for more

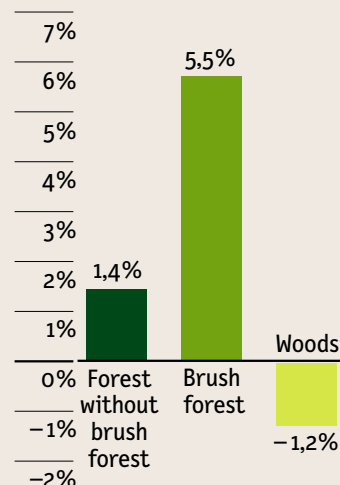
Wooded areas as a percentage of the total area by biogeographical region



Forest composition
Satellite data 1990/92



Evolution of wooded areas
by type of use
1979/85 – 1992/97



Wooded areas

than a century. For the 1992/97 survey period, it covered 12 716 square kilometres or 30,8% of the total territory.

Livestock goes, forests come

However, these new wooded areas are not so much the product of afforestations as of natural regrowth. On 86.8% of the newly wooded areas, trees grow without human intervention, mainly taking over alpine areas below the natural treeline which had been abandoned by mountain farmers or are used only sporadically for grazing. This regrowth varies in intensity and speed, depending on the region and the specific habitat. In the Grisons, the increase is 4.4%, in Canton Uri 3.4%, in Canton Valais 2.4% and in Canton Ticino – where most of the potential wooded surface is already covered by forest – 2.2 %.

Forests and their many protective functions

Within just 12 years, 13,2% of all new wooded areas have been created by afforestations – a figure which also includes afforestations to replace areas cleared for construction sites. Afforestation continues, especially on steep mountain slopes, in order to provide protection against natural hazards. For instance, coniferous forests at high altitudes extending up to the natural treeline are Switzerland's most significant avalanche protection factor. Forests with no major gaps not only stabilize the masses of snow on mountain slope but also provide protection against falling rock, landslides and torrential flooding. Admittedly, forests alone cannot prevent flooding and mudslides after periods of heavy rain, but their roots stabilize the soil, increase its absorption capacity and slow down the water flow-off, thus helping to defuse critical flooding situations and erosion problems. The notorious Höllbach in the Sense region of Canton Fribourg is a good example of this function: here, much of the stream's catchment area has been stabilized by afforestation since the early 20th century.



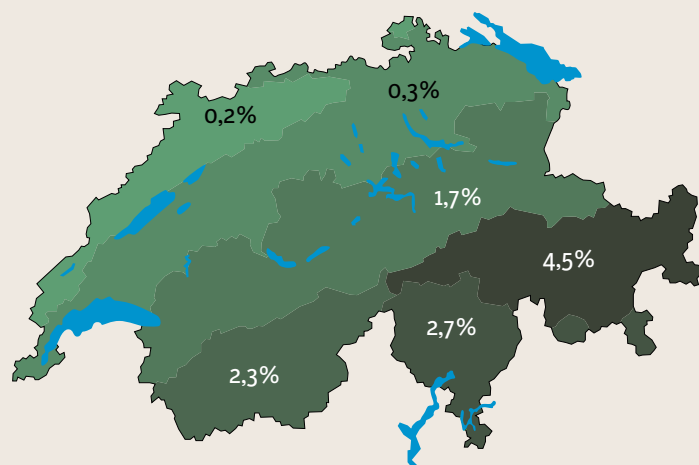
Radical timber felling until the end of the 19th century necessitated large-scale reafforestations to provide protection against natural disasters.



The effort proved worthwhile. After decades, the risk of landslides in torrent catchment areas has been minimized by stabilizing plantations.

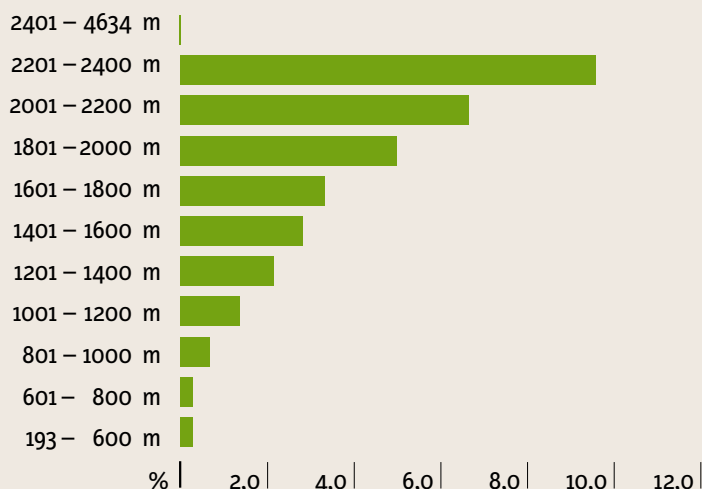
Evolution of forest areas

by biogeographical region 1979/85 – 1992/97



Increase in forest areas

by altitude level 1979/85 – 1992/97



- > Livestock goes, forests come
- > Forests and their many protective functions
- > Natural regrowth of forests



1989: The forest is reclaiming its former territory near the hamlet of Schallas (Schleuis, GR). The clearing in Val de Cafegn is gradually disappearing again.



2000: Eleven years later, trees are overgrowing the house. This extension of wooded areas is particularly prevalent in remote alpine valleys.

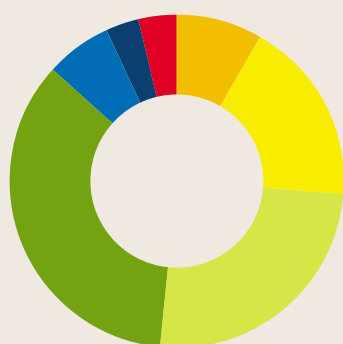
Natural regrowth of forests: an example

Arvigo in the Calanca Valley (southern part of the Grisons) is a typical example of the natural regrowth of forests in the alpine region. For this commune in the Misox region, wooded areas increased 5,3% between 1983 and 1995 to 909 hectares. More than half of this 46-hectare increase was at the expense of agriculture, reducing its productive area by a further 11% to 203 hectares. The remaining forest grew on unproductive areas. Below the treeline, it often takes the form of brush – an intermediate stage in the transition from agricultural land which is no longer used to wooded areas.

This gradual change in land use and the landscape reflects the difficult economic conditions with which mountain farming has been fighting for decades. Many young people have migrated from the remote Calanca Valley because of the lack of job oppor-

tunities there. In the late 1930s, Arvigo still had 28 farms. By 1990, only six remained. Where houses stand empty, mountain meadows lie fallow and no livestock graze on the pastures, more and more bushes and trees encroach on the land. Once, earlier generations of mountain farmers wrested additional hay meadows and pastures from forest land by the sweat of their brow, and now, over the past decades, nature has been reversing the trend. According to the land use statistics, this natural process of rewooding is to be found virtually everywhere in the Swiss Alps.

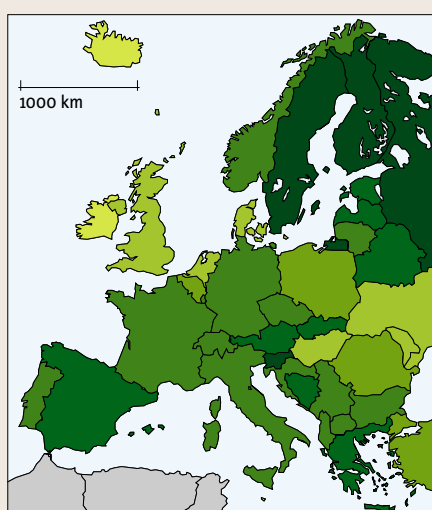
Origin of the new forest areas



New forest areas
derived from :

- 8,3% Agricultural areas (permanently inhabited area)
- 17,9% Alpine agricultural areas
- 25,4% Woods
- 35,1% Scrub vegetation
- 6,4% Other unproductive vegetation
- 3,2% Bare land
- 3,7% Settlement and urban areas (quarries, dumps, construction sites)

Forest as a percentage of the total area of European countries Status 1992/97



- < 10%
- 10 – 19%
- 20 – 29%
- 30 – 39%
- 40 – 54%
- > 54%

A balanced picture despite remarkable change dynamics

Unproductive areas

The surface covered by unproductive areas has decreased by 15 square kilometres or 1.5 thousandths over the twelve years. This virtually balanced picture is deceptive, in that natural processes are changing the alpine landscape over a much larger area.

The natural landscape: protection versus use

Where no forest grows, where agriculture does not seem viable because of low earning potential and where hostile conditions as well as great distances to core settlement and work areas also discourage human occupancy, land use statistics speak of unproductive areas. These cover inshore waters, wetlands, brush, rocks, scree, glaciers and perennial snowfields. The demarcation is not always unambiguous, especially in areas of transition to wooded areas and those used for alpine farming.

As a mountainous country, Switzerland has a fairly large percentage of such natural landscapes which account for a good quarter of its territory and constitute the predominant land cover in individual regions such as the western and eastern Central Alps, giving the landscape its "typical" appearance. Areas once described as wasteland are now intensively used in many places, both for tourism and hydroelectricity. In the plains, lakes, rivers and their

Natural processes – such as the mountain slide in Randa (Matter Valley, VS) – are a major factor in changing the landscape in alpine areas.

Unproductive areas: 1 052 617 ha



Lakes:
142 235 ha



Unproductive vegetation:
263 051 ha



Glaciers, perpetual snow:
134 757 ha

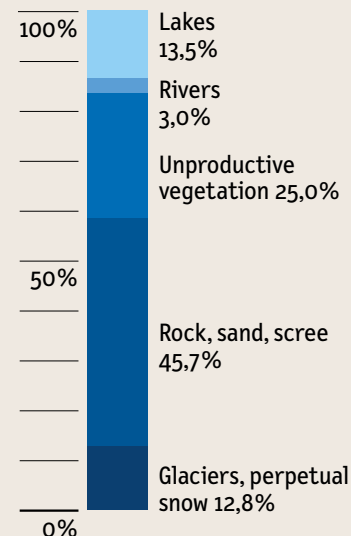


Rivers:
31 732 ha



Rock, sand, scree:
480 842 ha

Subdivision of unproductive areas Status 1992/97



- > The natural landscape: protection versus use
- > Natural processes predominate



Lake Constance near Eschenz (TG): lakes serve a dual purpose, as water reservoirs and recreational areas.



Retreating glaciers: Steingletscher in the Bernese Oberland commune of Gadmen.



1999 avalanche near Gschinen (Goms, VS): the destruction caused by natural hazards often changes local land utilization.

banks have a key recreational function in respect of town/city dwellers. Biotopes and nature conservation areas in dry and wet locations are also vital for preserving biodiversity in this intensively used area.

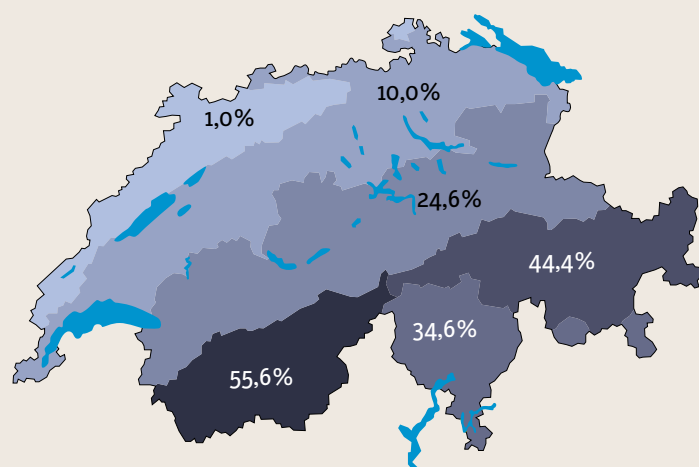
Natural processes predominate

With the construction and operation of dams, traffic ways, protective structures and tourism facilities, our civilization contributes to changing land use in the alpine

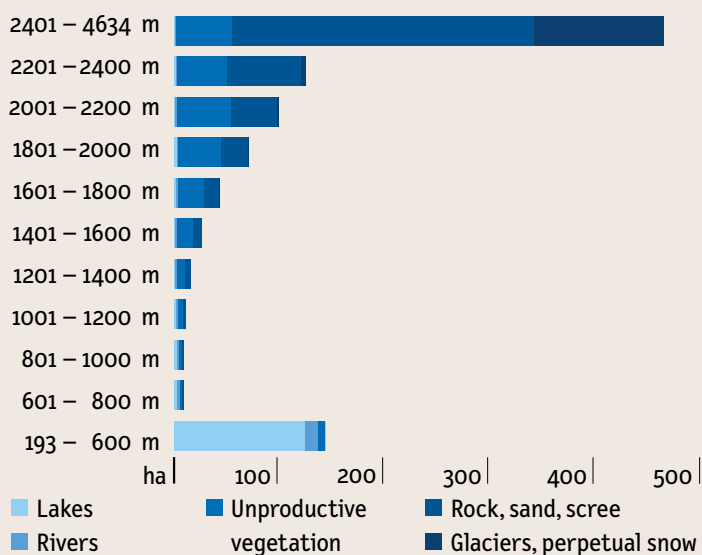
region. In contrast to the Central Plain, where most changes to the landscape are controlled by humans, it is mainly natural processes which determine land cover change in the case of the unproductive areas. Extreme weather conditions and the steepness of the terrain achieve an on-going evolution. For instance, rain and melting snow may penetrate cracks in rocks, freeze and cause whole rockfaces to break away. Shrinking glaciers as well as thawing permafrost may destabilize scree

on steep slopes, triggering major rock and mudslides. Besides abrupt events such as rock falls, floods, landslides or avalanches, slow and hardly perceptible processes also contribute to the changing landscape. For example, mountain streams carve new courses for themselves, whole slopes are eroded away or brush forests grow on scree-covered slopes over the years.

Unproductive areas as a percentage of the total area by biogeographical region



Share of unproductive categories by altitude levels in 1000 hectares



Unproductive areas

Balance despite change

During the period covered by the survey, nearly 159 square kilometres of new unproductive areas were created throughout Switzerland, largely at the expense of alpine meadows and pastures. At the same time, the land use statistics recorded a loss of 174 square kilometres of unproductive areas, most of it brush that originally developed on agricultural land and has since become forest. In this virtually balanced overall picture, the slight decrease of a good 15 square kilometres or 1,5 thousandths conceals the fact that changes are taking place over a much larger area.

Protective structures for settlements and traffic connections

At 0.2%, only a tiny fraction of unproductive areas were "man-made". These are artificial constructions providing protection against natural hazards such as avalanche and flood barriers. They now account for 22 square kilometres in all, ie. an area roughly the size of Lake Murten. Since the last survey, avalanche barriers take up 44,1% more space, and flood barriers 52,4% more space, underlining that increasingly intensive use of the alpine region necessitates substantial investments to protect traffic ways and settlements from natural hazards.

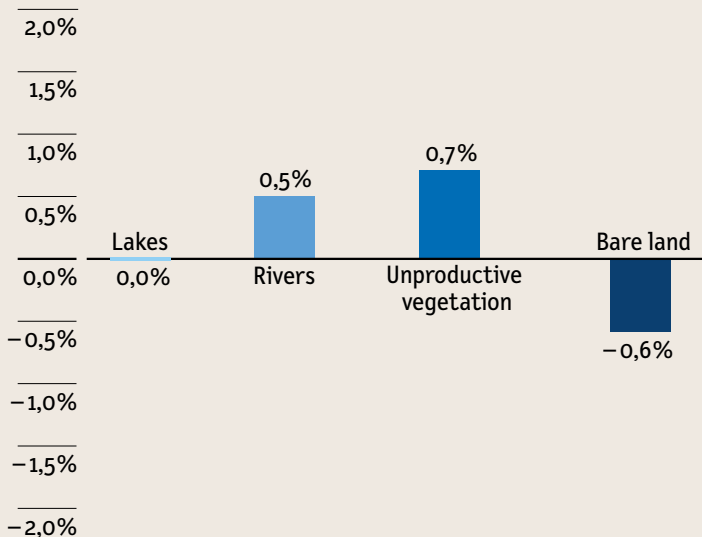


Turbenriet raised bog in Grabs (SG): conservation areas are essential components of natural landscapes.



Installation of an avalanche protection barrier above Airolo (TI).

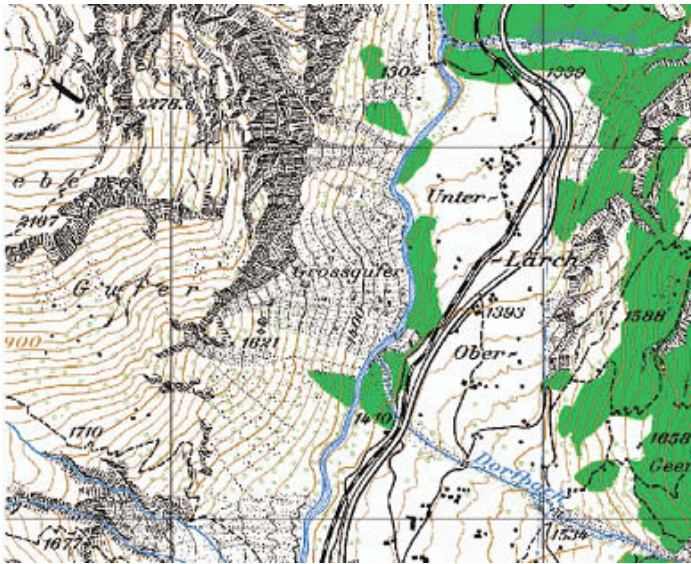
Development of unproductive areas by type of use 1979/85 – 1992/97



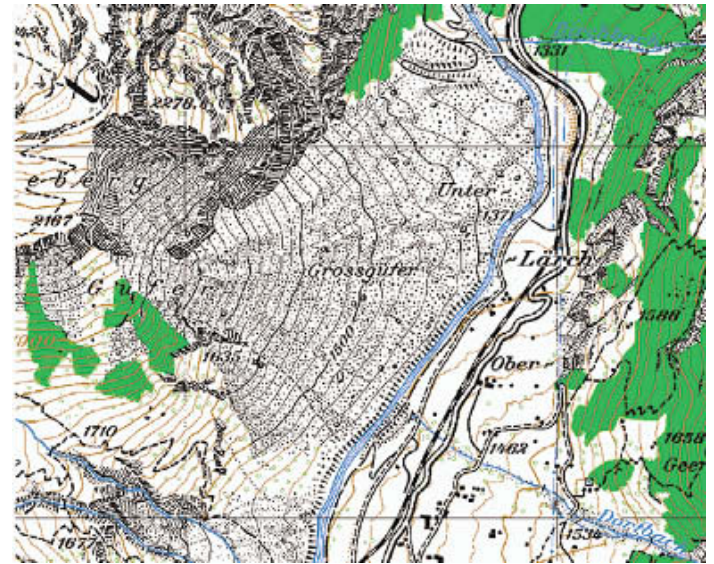
Glaciers and perpetual snow

"Glacier, perpetual snow" was surveyed for the first time as a separate category in the Swiss land use statistics for 1992/97. In the previous survey (1979/85), it was included together with "Rocks, sand, screes" in the former category of bare land. That is why the SFSO cannot yet indicate any change figures for this newly covered category. Therefore, only the planned future updates of the Swiss land use statistics will permit reliable information about surface changes of glaciers at a national scale.

- > Balance despite change
- > Protective structures for settlements and traffic connections
- > A rockfall changes the landscape



This section from the 1:25 000 map of Switzerland shows the Randa area before the mountain slide.



After the event: The break-off point and the gigantic trail of detritus are clearly visible. Smaller sections of forest and the former river bed are buried under metres of scree.

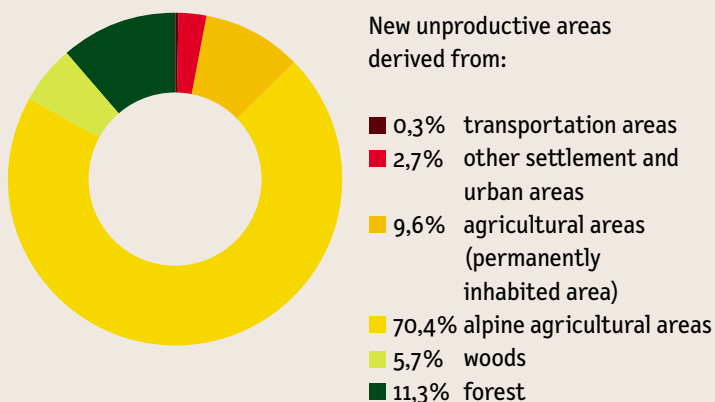
A rockfall changes the landscape: an example

Natural processes in unproductive areas frequently change existing uses below the vegetation line also. In the Swiss Alps, this is particularly true for rockslides, mudslides and landslides. Roughly 6% of Switzerland's territory consists of areas with unstable rock, and in these areas, natural disasters have repeatedly destroyed whole villages, cut off valleys and dammed rivers to form new lakes.

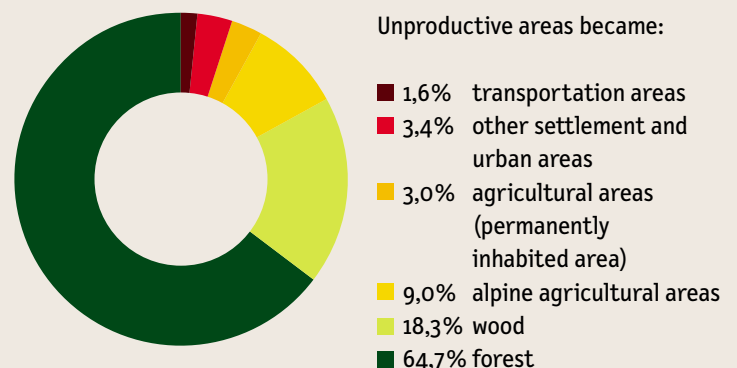
A fairly recent example of sweeping changes to the landscape caused by natural phenomena is the rockslide at Randa in the Matter Valley (Canton Valais). In 1991, more than 30 million cubic

metres of rock broke away in sections and buried the Unter Lärch area, destroying 37 buildings, 20 hectares of farming land and about 15 hectares of forest. The Matternvispa was dammed, requiring the construction of a new river bed, and both the cantonal highway and the Brig-Visp-Zermatt railway line had to be moved. In consequence, access to Zermatt was hampered for a long time. Comparison of the appropriate national maps at the scale of 1:25 000 before and after the rockslide highlights the radical alterations to the landscape and how natural phenomena may challenge cartographers too.

Origin of unproductive areas



Development of unproductive areas



Settlement growth is reaching limits

Future prospects

Within 12 years, 76 square metres of agricultural land a minute were lost in Switzerland, giving way to settlement areas (two thirds) and to forest (one third). Whether this trend will continue in future also depends on many factors. Further surveys will reflect any such developments.



Reserves of agricultural land are shrinking

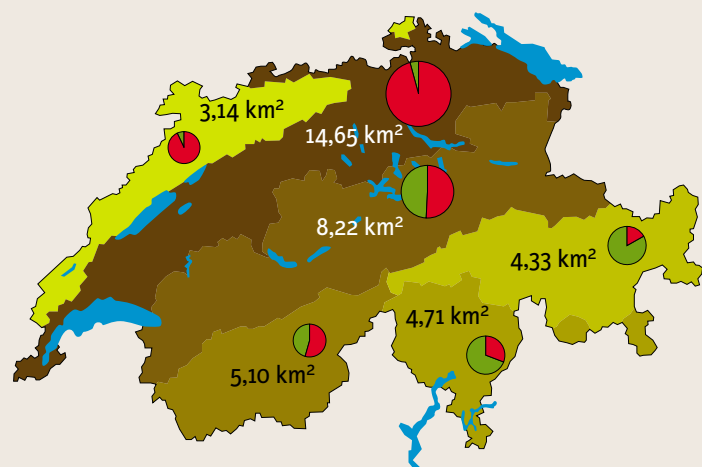
For the first time, comparison of the 1979/85 and the 1992/97 land use statistics makes it possible to accurately document land use dynamics. Within twelve years, an average of 1.27 square metres of farming land was lost every second, ie. about 40 square kilometres a year. Settlement development is the main cause of these losses, with additional settlements taking over just under two thirds of the agricultural land which has disappeared. Settlement expansion varies from region to region, but is highest in the already densely populated Central Plain. On slopes in hilly and mountainous areas, a third of remaining agricultural land losses is accounted for by abandoned meadows and pastures which have gradually been reclaimed by forests.

Extrapolation of losses of agricultural land

Unadjusted extrapolation of development trends from the fairly brief period of twelve years between the two surveys would show that agricultural land reserves, averaged out over the whole of Switzerland, would be exhausted in about

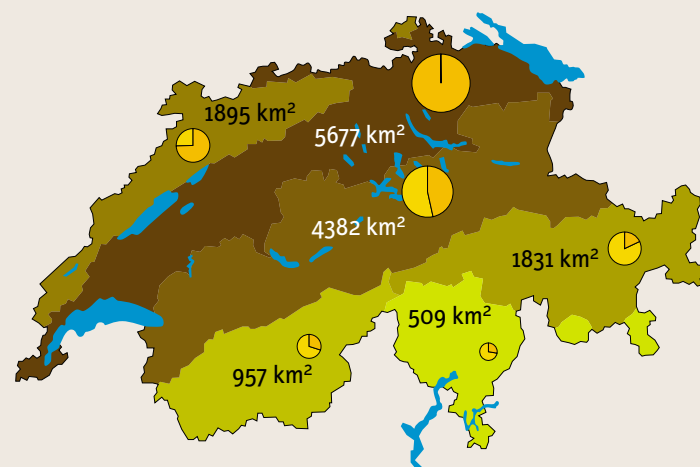
The Thyon 2000 holiday development in the Valais Alps above Vex.

Annual loss of agricultural area
1979/85–1992/97 by biogeographical region



Increase in settlement and urban areas
 Increase in forest areas

Presently available agricultural areas
1992/97 by biogeographical region



Agricultural areas in the permanently inhabited area
 Alpine agricultural areas

- > Reserves of agricultural land are shrinking
- > Extrapolation of losses of agricultural land
- > The objective: sustainable spatial development
- > Changes in land use as an indicator

380 years. According to this extrapolation, individual regions would have used up all their available reserves of farming land within the next century already. This applies in particular to the south Flank of the Alps as well as the western Central Alps, where the mountain farming exodus started much earlier, owing to the difficult conditions, and where a high percentage of wooded and unproductive areas limit settlement development. Matters will probably never deteriorate this far because federal policy plans point towards better husbandry of agricultural land in future.

The objective: sustainable spatial development

The Swiss Federal Council has made it quite clear on several occasions that Switzerland's growing urban sprawl runs counter to sustainable development principles. Land is a limited resource which should also be available to future generations in sufficient quantities. In its "Fundamentals of Town and Country Planning in Switzerland", published in 1996, the federal government set out its policies for countering the proliferation of undesirable land use and achieving sustainable spatial development. According to this report, existing settlements are to develop inwards more in future, to spare the landscape from fresh construction whenever possible. This involves rejuvenating and building up towns



Concentration and redevelopment within the bounds of existing settlements: demolition of a house in Neuchâtel (NE).

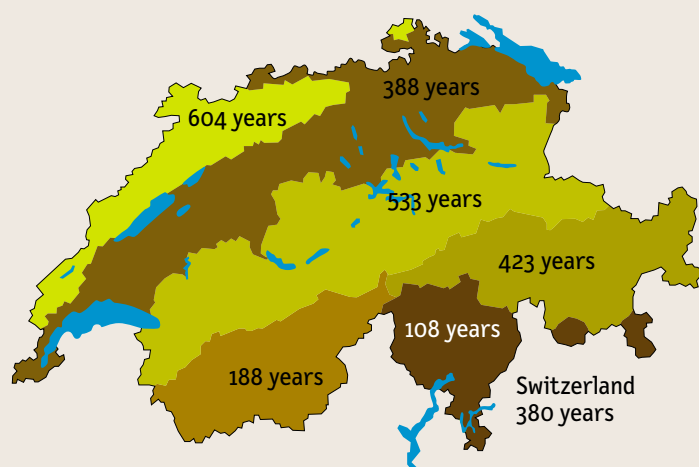
as places to live and work. At the same time, the Federal Council wants to limit the spill-over of built-up areas into neighbouring rural ones and to structure them more appropriately. In future, urban centres are to be better networked with rural areas too, and not just with each other. Finally, with an eye to decentral settlement of Switzerland, the aim is to preserve and develop rural regions also as living and economic space. In addition to planning and transport policy, the government's new agricultural policy plays a key role with its direct payments to compensate public and special ecological services rendered by agriculture as part of preserving and fostering a varied agricultural landscape.

Changes in land use as an indicator

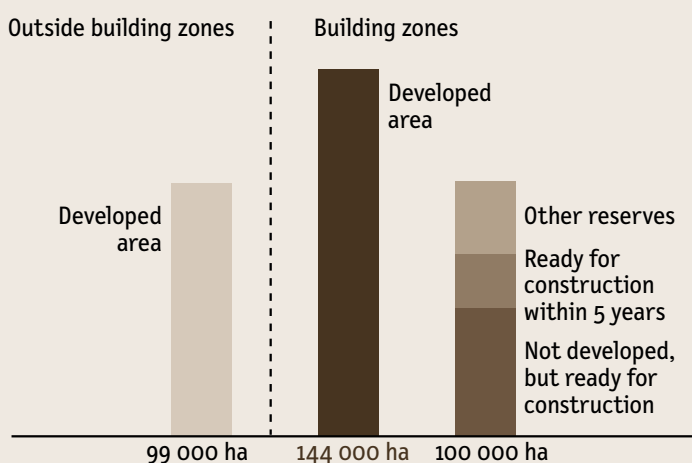
In "Agenda 21", the international community adopted a joint action plan for the 21st century at the 1992 Rio de Janeiro United Nations Conference on Environment and Development. The main objective of the comprehensive programme is to achieve development which is ecologically, economically and socially sustainable worldwide. One important focus is the sustainable management of land resources, with countries being called on – inter alia – to legislate to curb the use of productive arable land for other purposes.

The UN has suggested a standardized international system of valid indicators that measures and allows comparison of the progress made by individual countries on the way to sustainable development. The compilation of statistical data about changing land use is also regarded as a crucial indicator which, in Switzerland, will be directly derived from the presented land use statistics.

Years to the point of exhaustion of agricultural areas if the annual loss of agricultural land remains at the same level



Developed area and building zones



Services for planning and research

Applications for land use statistics

As a core instrument in long-term spatial observation, Switzerland's land use statistics provide precise, regionally differentiated data about the status and evolution of land use. In combination with other geographical information, they are also suitable for a wide range of planning and research tasks.

Efficiency review of town and country planning

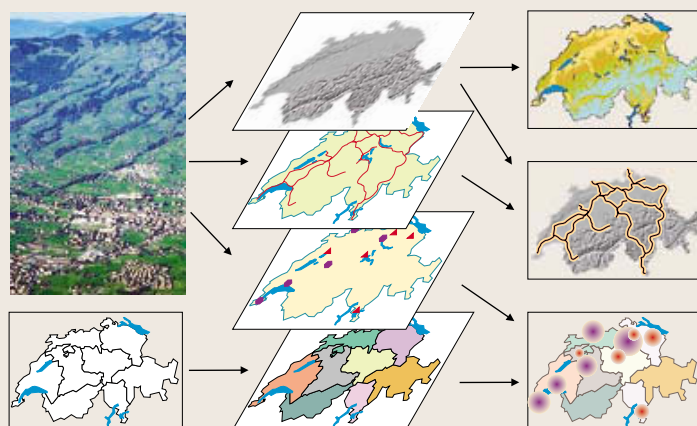
The purpose of town and country planning policy is to obtain careful husbandry of the land available and sustainable spatial development that directs settlement growth into controlled channels. But just how are these objectives achieved? To answer this question in sufficient depth, a monitoring tool which compiles thematically detailed information about land use over a longer period is mandatory. Nationwide changes can only be documented and regions differentiated by comparing such "snapshots". The findings then provide policy-makers and government bodies with the information they need to assess the effectiveness of past measures.

In the interests of research and planning

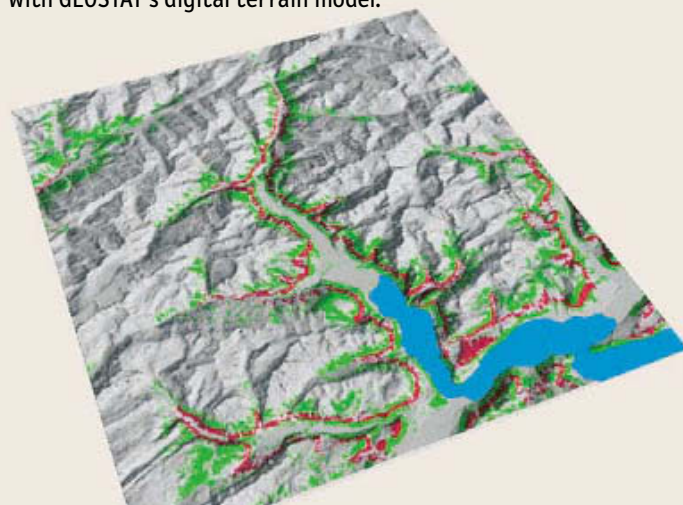
In addition to their spatial observation function, land use statistics offer a wide spectrum of potential applications, mainly in the fields of planning and environmental

Satellite image of central Switzerland: when combined with supplementary data, the Swiss land use statistics offer virtually unlimited potential applications.

Operation principles of a geographic information system (GIS)



GIS application: Representation of the forest level at an altitude of 800 to 1100 metres which is frequently in mist in the Canton of Uri. Combination of the forest areas from the Swiss land use statistics with GEOSTAT's digital terrain model.



Reality → GIS data (layers) → Combination → Result

- > Efficiency review of town and country planning
- > In the interests of research and planning
- > Land use statistics products

research. Depending on requirements, the data can be compiled with additional geographical information, such as slope inclination, altitude, exposition or population density. Combining them with a digital terrain model, for instance, makes it possible to demarcate avalanche risk areas on steep slopes with unfavourable land cover. The same method can be used to simulate precipitation flow-off in chosen catchment areas, allowing the calculation of flood torrents and thus indirectly helping to prevent and ensure protection against natural hazards. Land use data were used to highlight which mountain forests at critical altitudes were most exposed to fog—and hence to high pollution levels—in the Canton of Uri. In addition, spatially detailed land use information supplies an invaluable basis for long-term monitoring of conservation area development, determining suitable habitats for flora and fauna or establishing substance-flow analyses, such as the effect of fertilizer leaching on water resources. Depending on the research objective, professionals can obtain fresh information and know-how without conducting time-consuming surveys of their own, simply by targetting and linking existing datasets derived from various fields.

Land use statistics products

The digital geographical datasets of land use statistics are continually updated and can be obtained from the SFSO's GEOSTAT service as standardized products or wholly customized solutions. The products on offer include datasets on the requested types of use, generalized datasets featuring different resolutions for cartographic purposes and data aligned on European land use statistic standards (CORINE Land Cover).

Inter alia, the main land use statistical findings also feature in the following SFSO publications:

- **Die Bodennutzung in den Kantonen/ L'utilisation du sol dans les cantons (Land use in Swiss Cantons)**; set of eight volumes: 1: VD/GE, 1996; 2: FR/NE/JU, 1996; 3: BE/LU/OW/NW, 1997; 4: SO/BS/BL/AG, 1997; 5: VS, 1998; 6: ZH/ZG/SH/TG, 1998; 7: UR/SZ/GL/AR/AI/SG, 1999; 8: GR/TI, 2001
- **Swiss land use statistics in the European context**; brochure, 1998
- **Land use in Switzerland**, map with 18 types of use, scale 1:300'000, 1994

From 2002, publications about land use status and evolution down to commune level, as well as information about the survey method, will be published for the whole of Switzerland in the Swiss land use statistics series.

About GEOSTAT

GEOSTAT brochure, 1999

Download as pdf document under www.statistik.admin.ch/dienstle/elektron/dgeostato1.htm (available also in German, French and Italian version)

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Cover photographs: Wind damage to forests near Heimenschwand (Buchholterberg, BE). Transjuranne motorway tunnel entrance near Paquaille (Saint-Ursanne, JU). Building of new holiday homes in Ftan-Grond (Ftan, GR). Fallow land and terraces with scrub growth near Raft (Ausserberg, VS). The closed railway station at Niederlenz (AG) on the Lenzburg-Wildegg line. Protective reafforestation above Tschamut (Tujetsch, GR).

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