

The challenge of land abandonment after 2020 and options for mitigating measures

Annex



Agriculture and Rural Development



RESEARCH FOR AGRI COMMITTEE

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Annex

Abstract

This study examines the phenomenon of land abandonment, its consequences and mitigation options. Using quantitative data, it provides an overview of the possible future evolution of land abandonment in the EU by 2030, its historical evolution and current state of play. Based on desk research and case studies, this research project carries out an analysis of the drivers and effects of the phenomenon, considers mitigating actions to be implemented through EU policies, notably the CAP and outlines different scenarios about land use changes, using as variables climate change, the globalisation of markets and a major health crisis.

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1 QUANTITATIVE STATE OF PLAY WITH REGARDS TO LAND ABANDONMENT

1.1 Change in UAA

Figure A.1: Change in UAA between 2006 and 2012 in EU27 at NUTS 2 level

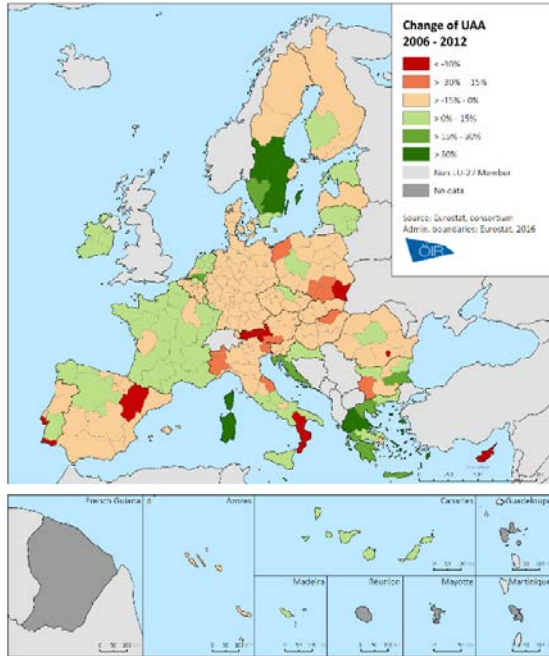
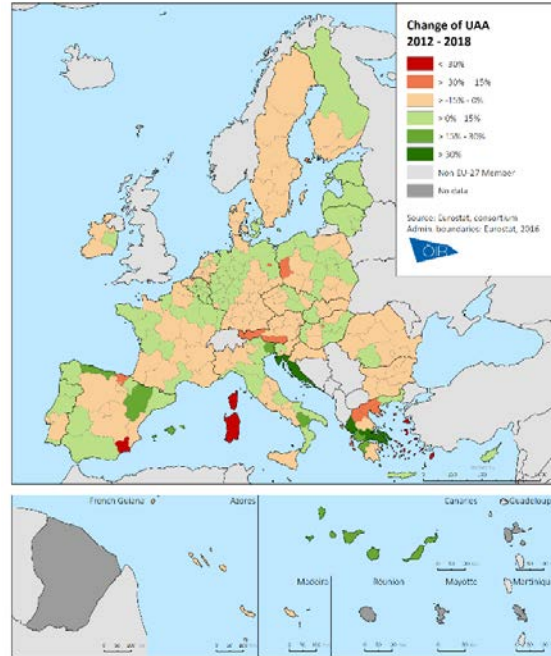


Figure A.2: Change in UAA between 2012 and 2018 in EU27 at NUTS 2 level

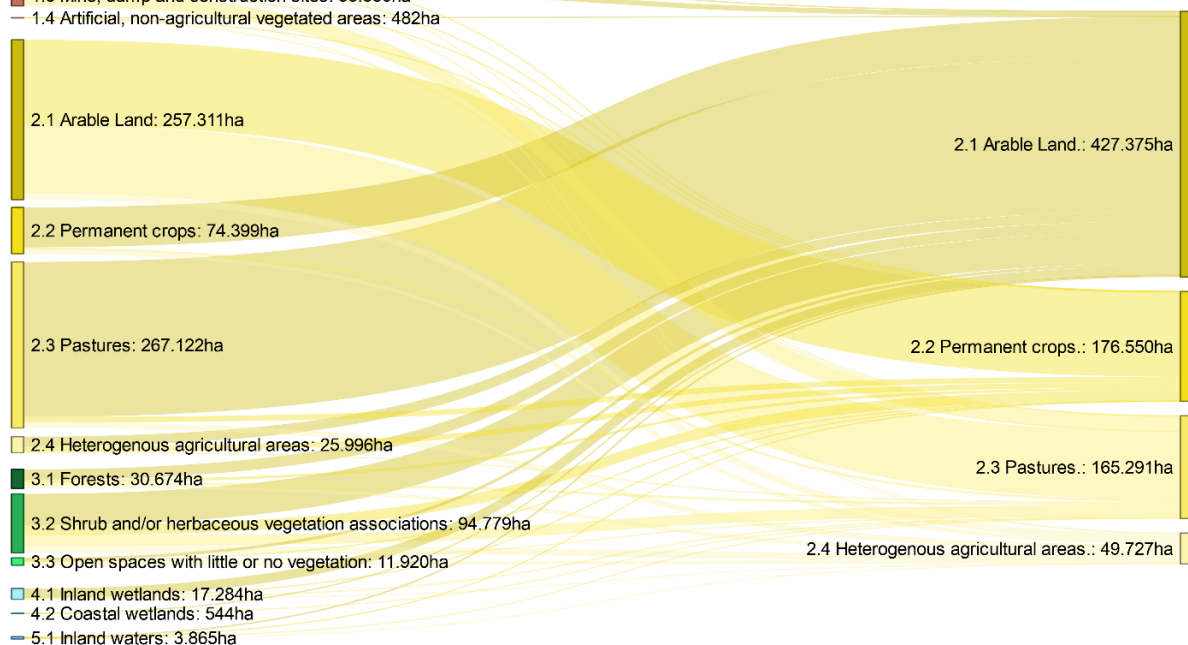


Source: Consortium, 2020, based on Eurostat.

1.2 Change between CLC land covers

Figure A.3: Change between land covers in 2012-2018

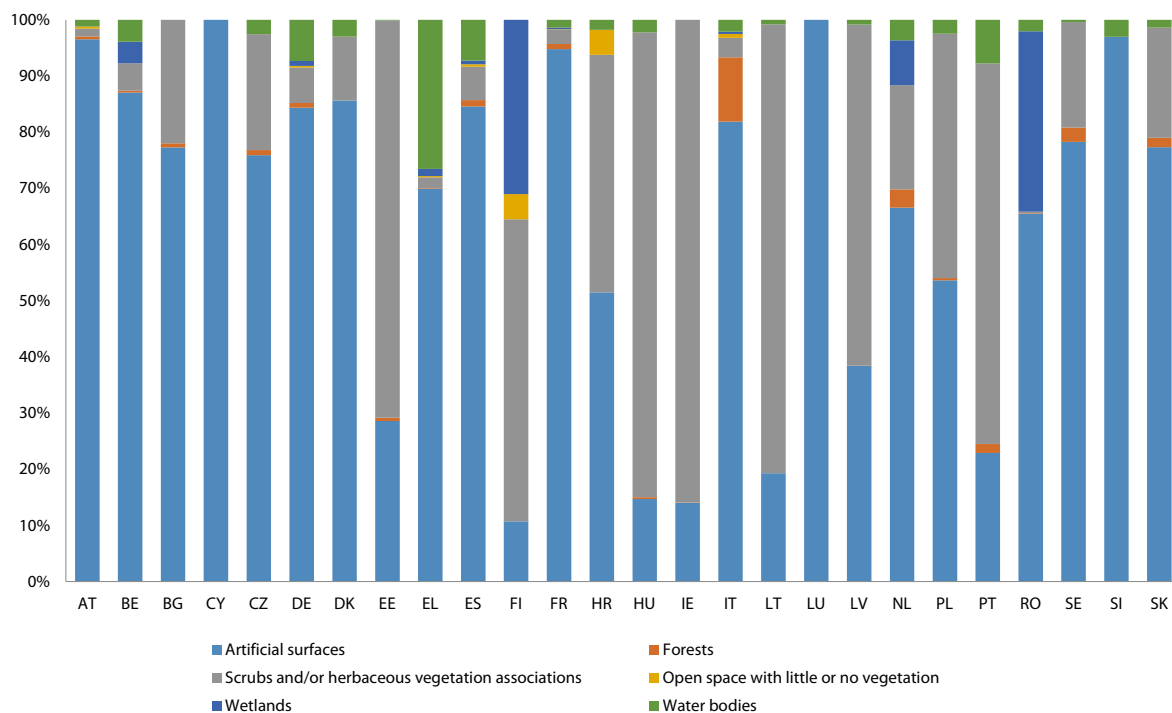
- 1.1 Urban fabric: 9ha
- 1.2 Industrial, commercial and transport units: 702ha
- 1.3 Mine, dump and construction sites: 33.856ha
- 1.4 Artificial, non-agricultural vegetated areas: 482ha



Source: Consortium, 2020, based on EEA (CORINE Land Cover Data).

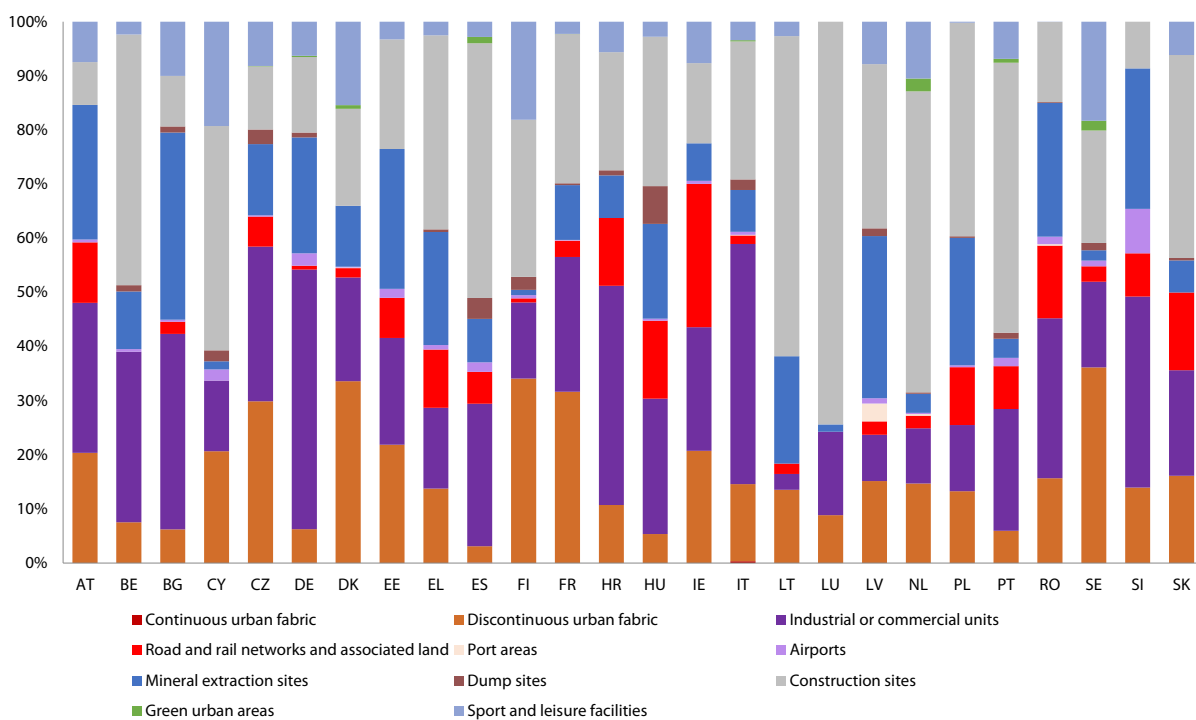
1.3 Land cover change from agricultural areas to other land class covers between 2006 and 2012

Figure A.4: Land cover change from agricultural areas into other land cover classes between 2006 and 2012 at MS level¹



Source: Consortium, 2020, based on EEA (CORINE Land Cover Data).

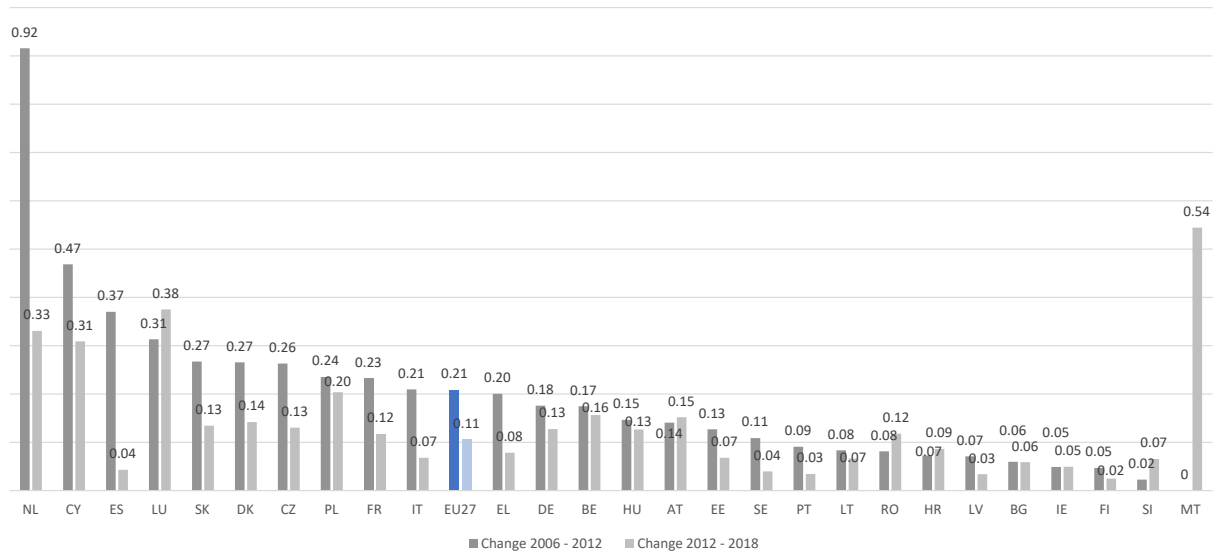
Figure A.5: Land cover change from agricultural areas into artificial surfaces between 2006 and 2012 in EU 27 at MS level (no data available for Malta)



¹ No data available for Malta.

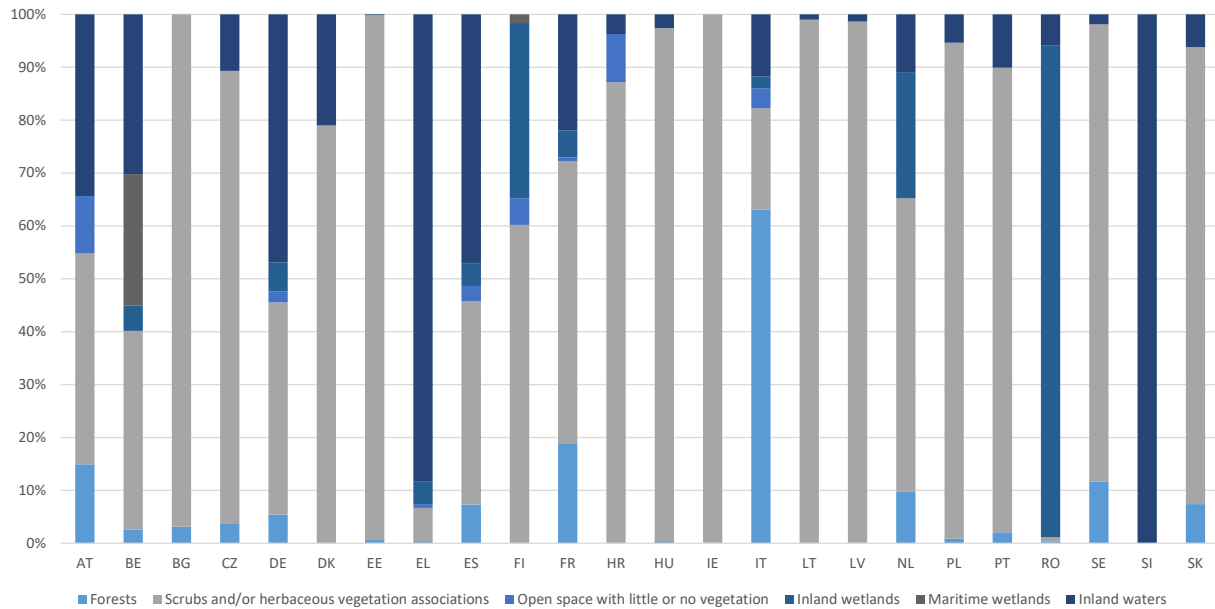
Source: Consortium, 2020, based on EEA (CORINE Land Cover Data).

Figure A.6: Land cover change from agricultural areas into artificial surfaces between 2006-2012 and 2012-2018 at MS level (%)



Source: Consortium, 2020, based on EEA (CORINE Land Cover Data).

Figure A.7: Land cover change from agricultural areas into natural surfaces between 2006 and 2012 at MS level



Source: Consortium, 2020, based on EEA (CORINE Land Cover Data).

1.4 Land cover change from agricultural areas into artificial surfaces

Figure A.8: Land cover change from agricultural areas into artificial surfaces between 2006 and 2012 at NUTS-3 level

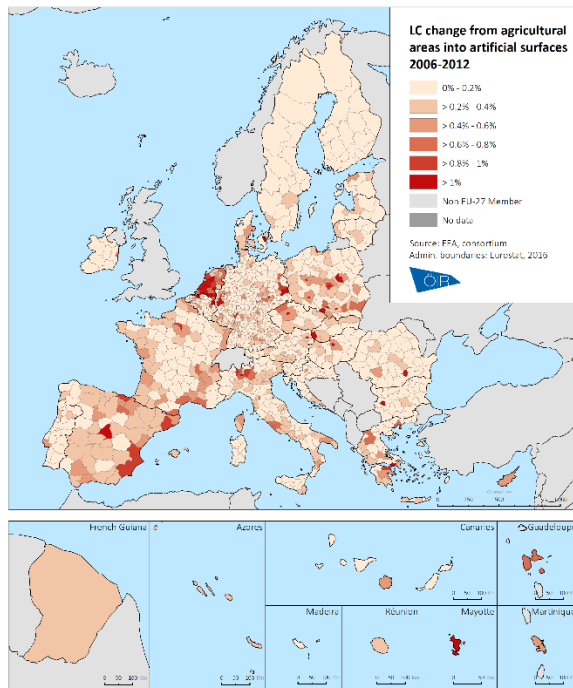
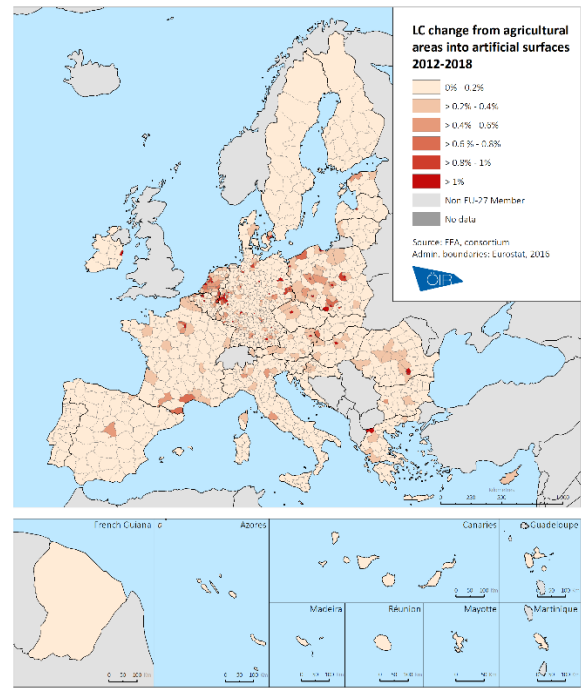


Figure A.9: Land cover change from agricultural areas into artificial surfaces between 2012 and 2018 at NUTS-3 level



Source: Consortium, 2020, based on EEA (CORINE Land Cover Data).

Figure A.10: Land cover change from agricultural areas into natural surfaces between 2006 and 2012 at NUTS-3 level

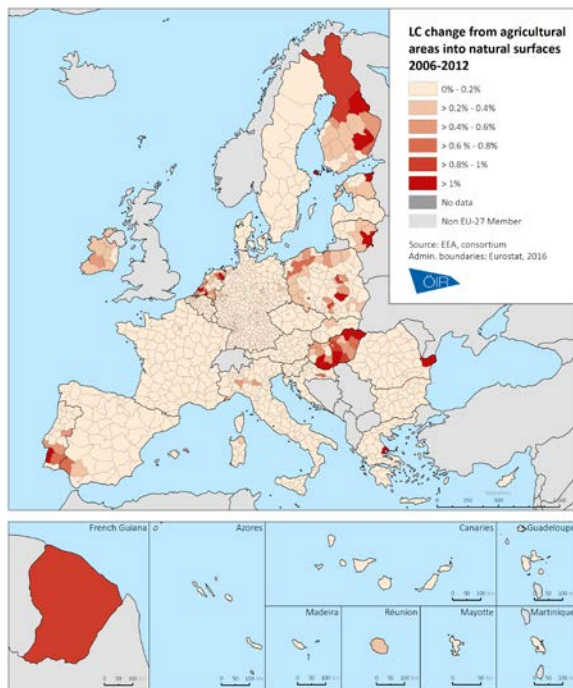
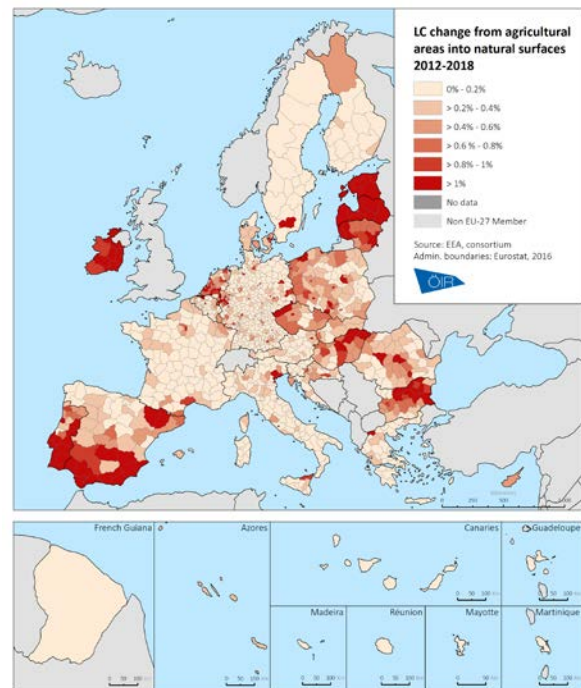


Figure A.11: Land cover change from agricultural areas into natural surfaces between 2012 and 2018 at NUTS-3 level



Source: Consortium, 2020, based on EEA (CORINE Land Cover Data).

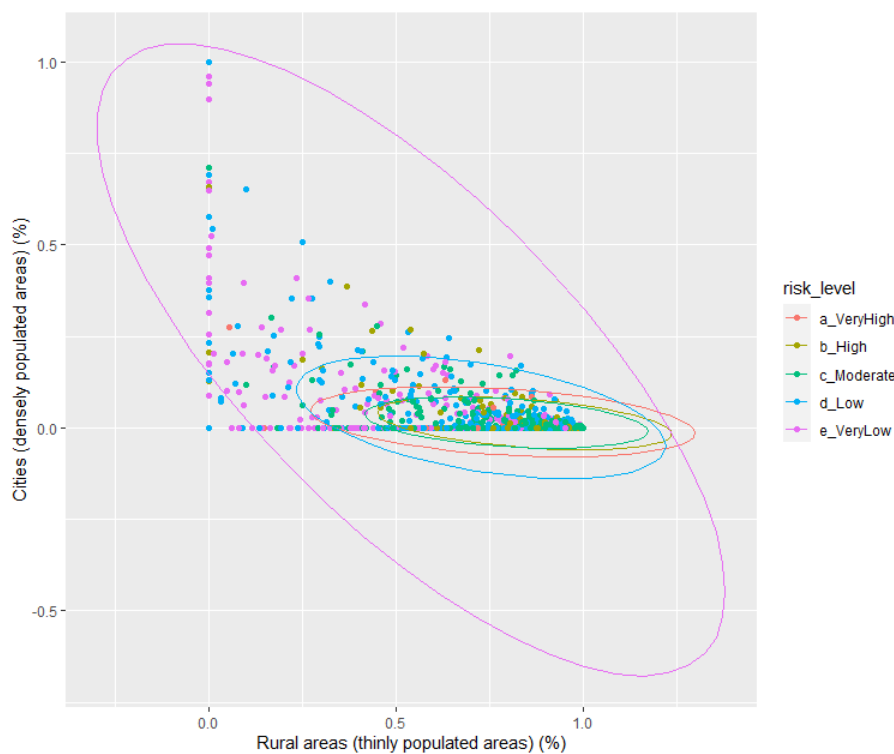
2 SCATTERPLOTS FOR PATTERN ANALYSIS OF THE RISK OF LAND ABANDONMENT

Additional scatterplots were created to show the percentage distribution of the different territorial types per NUTS-3 region grouped by the five risk levels. Due to the two-dimensional representation (x/y-axis), two characteristics of land are always compared. The following results are based on data from DEGURBA (degree of urbanisation) (EUROSTAT, 2019), mountainous versus non-mountainous areas (DG Regio, 2016), and agricultural areas derived from CLC (2018).

DEGURBA (degree of urbanisation) by Area (Source: EUROSTAT, 2019)

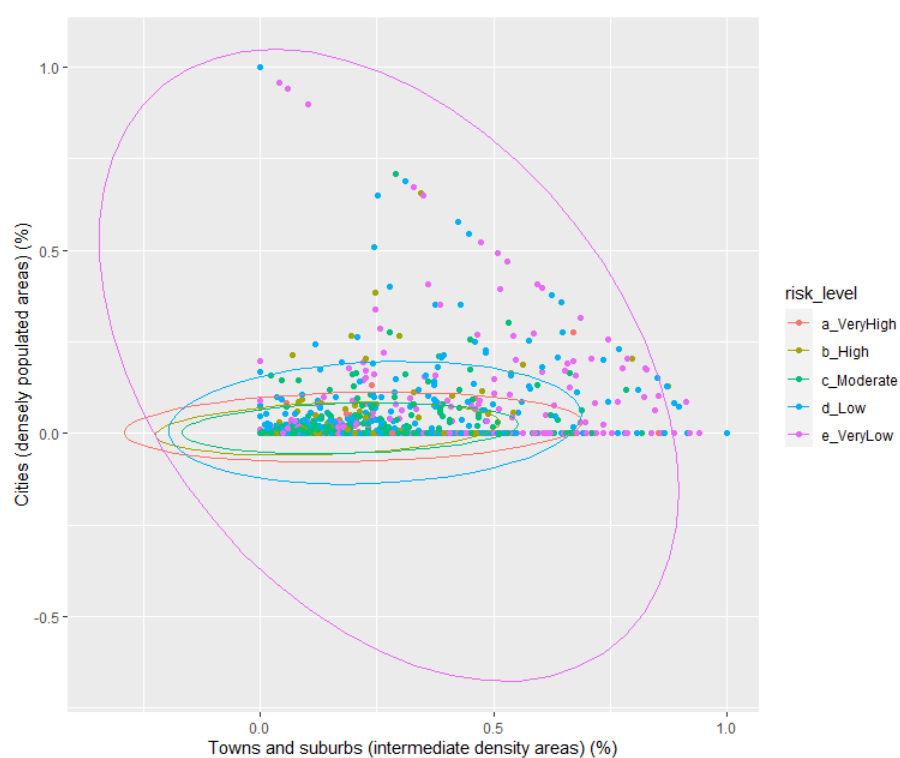
The ellipses in the following three figures show that the “low risk” level extends very far, while the other risk-levels focus on a narrower percentage space, indicating that various combinations of degree of urbanisation are affected by a low risk of land abandonment, whereas other levels of risk are focuses on a more precise combination of varying populated area. A higher concentration of moderate to very high risk levels occur, for instance, where the share of rural areas is comparable high.

Figure A.12: Scatterplot of percentage distribution between cities and rural areas grouped by the five risk levels of land abandonment



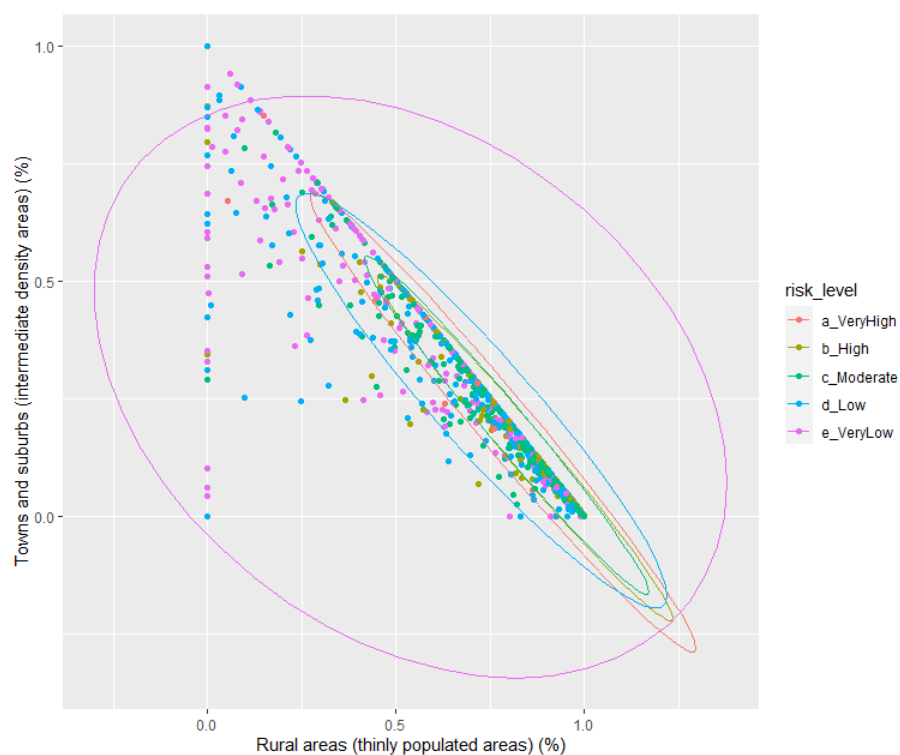
Source: Consortium, 2020, based on Eurostat, 2019 and on Perpiña Castillo C et al., 2018.

Figure A.13: Scatterplot of percentage distribution between cities and towns and suburbs grouped by the five risk levels of land abandonment



Source: Consortium, 2020, based on Eurostat, 2019 and on Perpiña Castillo C et al., 2018.

Figure A.14: Scatterplot of percentage distribution between towns and suburbs and rural areas grouped by the five risk levels of land abandonment.

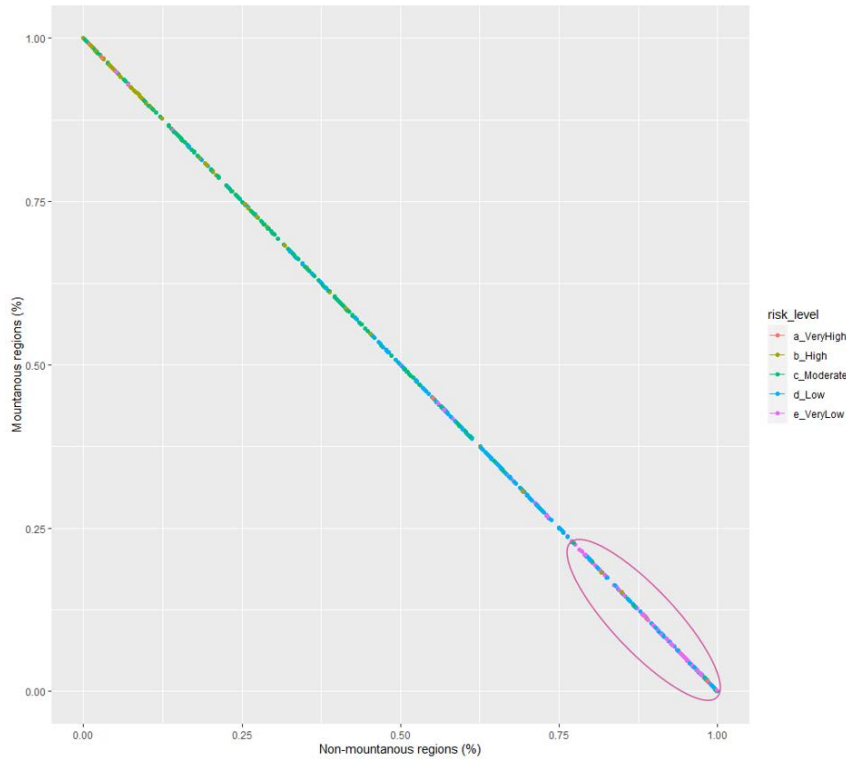


Source: Consortium, 2020, based on Eurostat, 2019 and on Perpiña Castillo C et al., 2018.

Mountainous/Non-mountainous regions by area (Source: DG Regio 2016)

As we compare only two territorial typologies (mountainous with non-mountainous areas), the varying compositions lie on a straight line between 0 and 1 (Figure A.15). The highest number of dots that correspond to a very low risk of land abandonment are located between 75 and 100% share of non-mountainous surface area.

Figure A.15: Scatterplots of percentage distribution between mountainous and non-mountainous areas grouped by the five risk levels of land abandonment

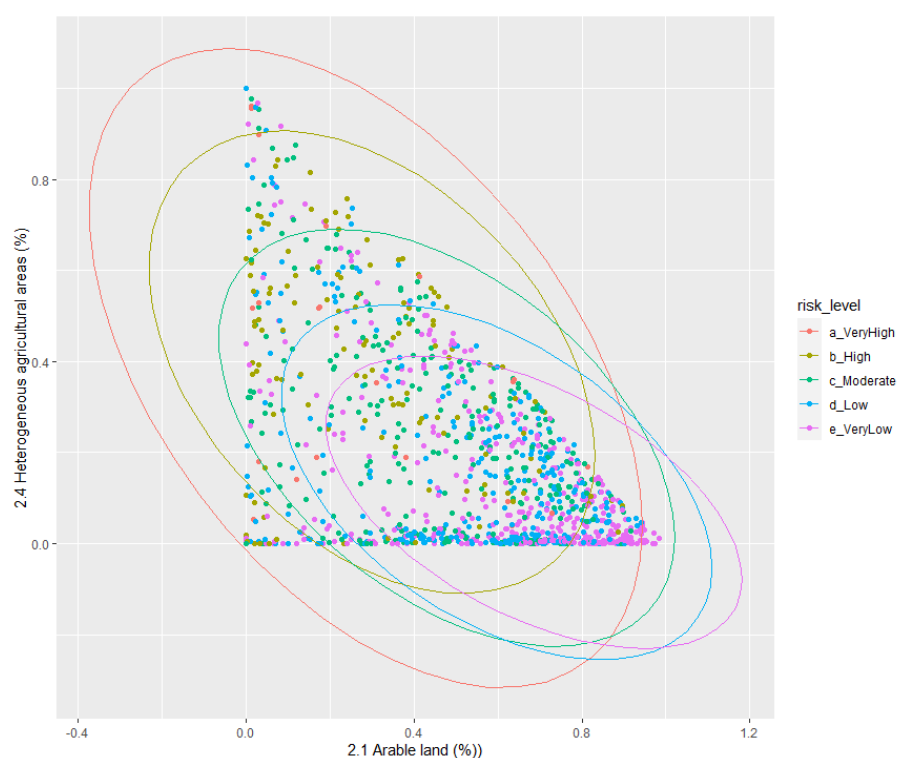


Source: Consortium, 2020, based on DG Regio, 2016 and on Perpiña Castillo C et al., 2018.

CLC (Corine Land Cover) 2018 – class 2 (Agricultural Areas)

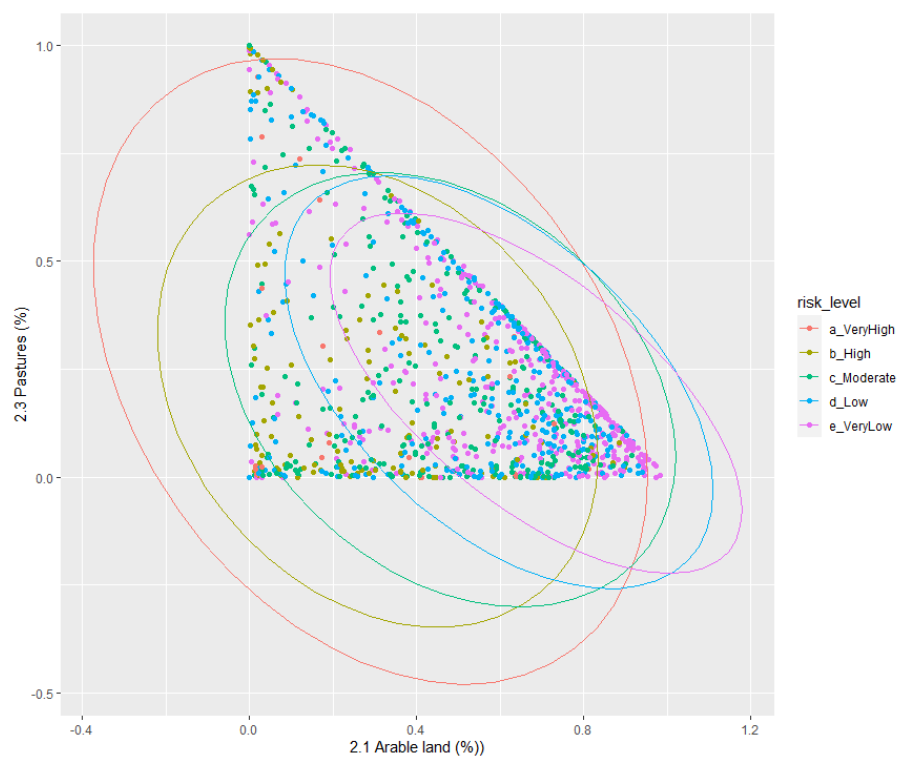
The scatterplots below indicate that NUTS-3 regions with a higher share of arable land and a lower share of other agricultural areas are characterised by a lower risk of land abandonment.

Figure A.16: Scatterplots of percentage distribution between arable and heterogeneous agricultural areas grouped by the five risk levels of land abandonment



Source: Consortium, 2020, based CLC, 2018 and on Perpiña Castillo C et al., 2018.

Figure A.17: Scatterplots of percentage distribution between arable agricultural areas and pastures grouped by the five risk levels of land abandonment



Source: Consortium, 2020, based CLC, 2018 and on Perpiña Castillo C et al., 2018.

3 BRIEF CASE STUDY REPORTS

3.1 Case Study Report: Kainuu (Finland)

Country: Finland

Region: Kainuu (NUTS3 area: FI1D8)

Report by: Thomas Dax and Ingrid Machold

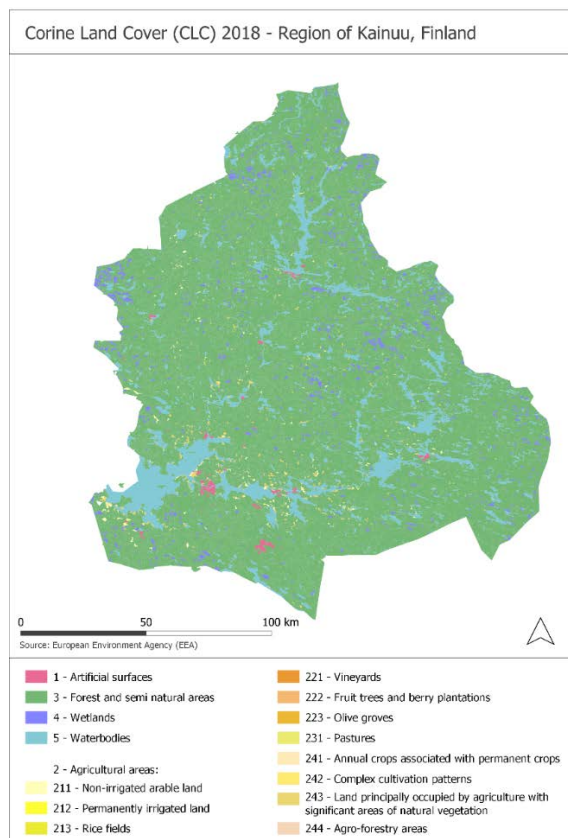
3.1.1 General summary of regional context, overview of land use and land use change

3.1.1.1 Summary of general context information

Kainuu is a NUTS3 region located in Northern and Eastern Finland with a border to Russia on the eastern part (Nuts2 FI1D – North and East Finland). It has an extension of 24.452 km² with a density of population of only 3.1 inhabitants per km² (in total about 72,000 inhabitants). The largest city is Kajaani with about 37,000 inhabitants. The climate of Kainuu is continental with distinct cold and warm seasons ranging from average -8°C in January to 21°C in July. Kainuu is one of the snowiest parts of Finland with an average of 70-80 cm snow cover during winter time. The distance to the capital Helsinki is about 500 km.

The area is mostly covered by forests and semi-natural areas, like moors and swamps (86% in 2018), lakes and wetland (13%). Agriculture is only of minor importance with 1% of land cover (see map below). Due to the minor relevance of agricultural areas, the absolute amount of land cover change is very minor.

Figure A.18: Corine Land Cover map 2018, Kainuu region



As described above, Kainuu is very sparsely populated. Moreover, the population number declines steadily with an average annual variation (2014–2015) of -0.95% equally due to negative natural and migration balances (AdminStat Finlandia).

Key sectors of regional economy in Kainuu are the bio-economy, IT-sector, mining and tourism. Due to the huge expansion of the forest area all uses connected to forests and wood production are the backbone of the regional economy. In recent years the scope of use of renewable natural resources expanded, but still centers around the key activities related to forest bio-economy development including biofuels, bioethanol, wood construction, paper and pulp technologies (Karjalainen 2016).

3.1.1.2 Specific context information

The remote location of Northern and Eastern Finland and specifically the region of Kainuu provides a case which poses marginalization threats into the center of the discussion of land abandonment. The sector development is hence assessed and influenced from its geographical position and particularly linked to large-scale effects within the EU and global value chains.

Desk research underlined that Finland, and in particular remote places like the CS, are heavily exposed to marginalization processes which is expressed in peripheralization of regions and, with regard to land use development, trends towards land abandonment. However, recent studies in Finland are not very much addressing this issue. Nevertheless, we might assume a strong push factor for ceasing of land use due to agricultural structural change (Kässi et al. 2015), very low productivity of agricultural land, limited options for livestock production and threats for continued nature-based landscape development.

While the general threats were confirmed in the interviews, the policy environment and the strategies of the small remaining numbers of land managers have led to a rather stable use of area (both for UAA and forest area). There is hence hardly an immediate challenge of “decrease” of UAA, but rather a gradual further “elimination” of the very tiny spots of UAA still in management in the area.

In northern Finland and particularly in Kainuu agriculture is primarily oriented at dairy farming, with minor cultivations of cropland being restricted mainly to barely and grassland. These activities seem the only profitable way of farming in the area. Although the extent of agricultural area has been stable over the last years, structural change is ongoing. Small farms tend to be sold or leased out (particularly when there is no successor), but their agricultural areas are still passed on to other farmers and cultivated in some way or other. However, the number of farms is decreasing steadily. Risk of abandonment of (specific) agricultural areas occurs particularly in such cases where the distance of agricultural area to the center of the farm is more than 10 km. These areas will most likely gradually turn to forests.

The biggest problem in the region (but similarly all over Finland) is the loss of the remaining open spaces and linked to that the decline of valuable habitats which are found particularly at the intersection between agricultural land and forest area. These changes may happen very slowly over many years and, at short term periods, only small strips of land between cultivated areas and forests might be affected which might be overlooked by the scale of main observation techniques. In addition, these changes would lead to a substantial decline in biodiversity levels.

3.1.1.3 Overview of land abandonment issues

Over a long time period land management in Finland was rather stable, at least as far as UAA development over the last century is concerned (LUKE 2020). Even if there was a certain peak of UAA in the middle of the 20th century the decline thereafter does not show an alarming signal, and moreover, the development stabilized in recent decades. However, up to 2000 this threat was taken

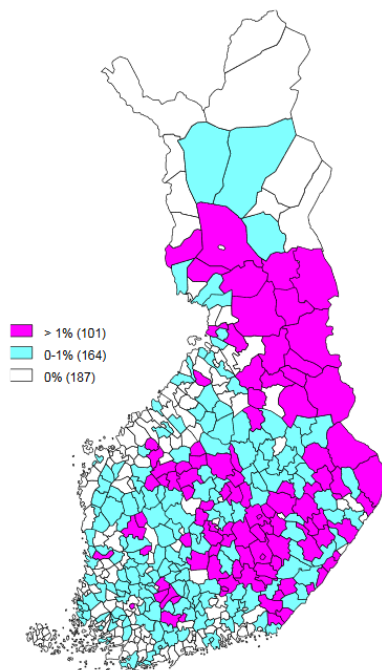
more seriously. A core study by Pyykkönen (2001) analysed structural changes and the issue of arable land threatened to be left permanently uncultivated. In that study marginal arable land was classified as “fields which no one wanted when offered for either sale or hire in the context of early retirement” (cited from Vihinen et al 2005, 17). The extent of those areas at the local scale is shown in the map below, pointing to the specifically high share of marginal land in the CS. This chimes with the risk assessment of JRC which put this area into the category of highest risk for land abandonment.

Table A.1: Agricultural land use regionally in Finland, natural meadows and pastures (Information of the Ministry of Agriculture and Forestry, National Board of Agriculture)

Area (earlier province)	1969	1982	1990	2000
Uusimaa	9,622	7,873	6,657	1,774
Turku and Pori	21,802	16,738	15,385	3,266
Åland	6,151	4,501	4,109	4,683
Häme	16,252	14,933	12,152	1,971
Kymi	7,169	5,844	4,221	393
Mikkeli	13,564	11,388	10,026	1,086
Pohjois-Karjala	13,554	11,316	9,222	643
Kuopio	15,237	12,420	10,330	1,169
Keski-Suomi	12,525	10,963	7,725	782
Vaasa	12,145	11,630	10,037	1,205
Oulu	14,458	18,037	24,707	2,633
Lappi	10,963	12,966	7,687	1,261
Whole country	153,442	138,609	122,258	20,866

Source: Vihinen et al 2005, 35.

Figure A.19: The share of marginal land of all agricultural land per municipality



Source: Pyykkönen 2001, p. 41

Differentiating the changes of land use, it appears that particularly the loss of semi-natural grassland in a boreal landscape is at stake (Aune et al. 2018). In a long-term perspective those issues were already addressed by statistics of agricultural land use at the regional level for natural meadows and pastures which were particularly threatened. As the table below indicates the loss of those areas was particularly

expressed in the 1990s, underpinning the effects of integration and modernisation of Finnish agriculture in that period.

As Vihinen et al. summarize in their national report at that time “(l)andscapes are undergoing further changes although the greatest qualitative changes have probably already occurred with structural and technological change” (Vihinen et al. 2005, 81).

Analyzing the changes in UAA for the years 2005, 2010 and 2019 underpins the spatial concentration of land management problems for the area of Kainuu, as presented in Figure A.19. As the aspect of decline in UAA occurs in temporal waves, we notice a slight increase of UAA in the period 2005-2010, whereas since 2010 the highest decrease for all Finnish regions was observed in Kainuu (Table A.2). Moreover, the structural changes taking place are underlined by the drastic reduction of farms throughout both periods and all over Finland (Niskanen 2020).

Table A.2: Change of UAA in regions of Finland (2005-2010-2019)

	2005-2010		2010-2019	
	Area (p.a.)	Farms (p.a.)	Area (p.a.)	Farms (p.a.)
Uudenmaan	-0.25	-2.49	-0.21	-2.44
Varsinais-Suomen	-0.03	-2.38	-0.10	-3.13
Satakunnan	0.05	-2.80	-0.36	-3.39
Hämeen	0.07	-2.36	-0.29	-2.78
Pirkanmaan	-0.08	-2.62	0.15	-1.87
Kaakkois-Suomen	0.10	-2.67	-0.43	-3.01
Etelä-Savon	0.14	-3.25	-0.23	-2.04
Pohjois-Savon	0.51	-2.50	0.00	-2.79
Pohjois-Karjalan	-0.77	-3.11	-0.07	-2.44
Keski-Suomen	-1.03	-3.25	-0.63	-1.81
Etelä-Pohjanmaan	0.24	-3.20	0.15	-2.70
Pohjanmaan	-0.09	-2.53	0.05	-2.94
Pohjois-Pohjanmaan	0.96	-2.23	0.65	-2.41
Kainuun	0.86	-2.89	-2.24	-4.14
Lapin	0.28	-3.27	-0.08	-2.25
Ahvenanmaa-Aland	-0.58	-1.84	-1.91	-3.65
Finland – Total	0.15	-2.69	-0.09	-2.67

Source: Niskanen 2020 In recent decades, the cultivation of agricultural land is much more strongly connected with subsidies. CAP subsidies have been elaborated and intensified after EU accession which even led to an increase of cultivated land in remote areas like Kainuu. Besides the EU funds provided through CAP, also national top-up payments supported the cultivation of new fields and the enhancement of agricultural areas. However, taking account of the adverse effects, this national support scheme has been stopped for “new” agricultural fields a few years ago and concentrates now on the maintenance of already existing agricultural areas. Nevertheless, it is assessed as a strong stimulus to a stable development of the extent of agricultural areas. But even this positive effect on keeping land in production has its limits, and as a rule of thumb ends at a distance of agricultural areas about 10km from the farm stable.

Due to the majority of land managed as forests, most land use changes occur within forest changes and thus a sound assessment of forest policies, and effects on regional and environmental outcomes is crucial. Similar to agricultural land uses, also forest structural development is of big concern and concentration aspects prevail. The strong focus on exploitation has been superseded by the rising concern for quality enhancement, regional effectiveness and long-term views on climate change implications (Henttonen et al. 2020).

3.1.2 Information on drivers and effects

"In the case of Finland, both social and economic marginalisation of farms can be seen to be results of a drastic structural change due to technological change and partial deregulation of global food market, which excludes certain farms and certain areas from agriculture. Structural change includes both the concentration of production to fewer regions and to fewer farms. The change in production structure affects the economic viability of rural areas even more than the diminishing numbers of farms affect it. Production concentrates on areas where it is already strong, which indicates that the losing areas cannot compete under the present price level. The Finnish state has accelerated this structural change by directing investment aid and setting up young farmers in farms bigger than the average in the country. This is a deliberate choice meant to facilitate the adjusting of Finnish agriculture to the EU context (Ministry of Agriculture and Forestry 2001b, p. 53–54). But it is a choice based on a uniform strategic vision assuming that there is only one economically viable farm type, characterised of large area, high capital intensity and specialised production" (Vihinen et al 2005, 18). This strong dependence on CAP support and substantial impact on stifling land abandonment has even increased over the following programme periods within EU support (Kässi et al. 2015).

That assessment of the situation and challenges about two decades ago has been reaffirmed by the expert interviews who claimed that the strategy had not changed in its main thrust, but probably very recently is about starting to shift and provide space for alternative views and action.

In particular, in Finland the challenge of climate change is an important large-scale driver which might impact on that strategy. So far climate change observation suggest that it already has led and continues to lead to further rapidly increasing temperatures throughout the country. Temperature conditions rapidly move northwards and change production conditions in a comparably short time-frame. This may increase productivity of agriculture on the one hand, but on the other hand there is a natural limit to the cultivation due to season specific features, like limitations of sunshine and periodicity of high temperatures shortening the available vegetation period (short summer and long winter with little insolation). Furthermore, low temperatures also deploy positive side-effects, like protecting fields from pesticides and diseases etc.

Experts are aware of the geographical position of Finland, and the CS region which show a delicate balance between the various land uses and a high vulnerability to changes. As such slight changes in UAA might have a strong effect on risk assessment, and non-agricultural development has important repercussions for agricultural and forest developments.

Furthermore the "heated" discussion on Climate change adaptation, including the aspect of **peatland conversion** poses a huge ecological problem (Greifswald Mire Center et al. 2020). A recent national study commissioned by the Prime Minister's Office (Aakula et al. 2019) points to the crucial role of peat land and the imperative to manage a cautious use in the future in order to achieve positive environmental effects. Similarly, the study calls in its scenarios for a limiting of clearing of peat soil forests for other land use to achieve the objectives for reduction of greenhouse gas emissions from other land use than forest by 2050.

From a regional development perspective, it is also an issue of preserving the remaining UAA in management to avoid the development of the region towards a mono-structural area of woodland which would also be harmful to the attractiveness of the region, well-being for local inhabitants and the destination management for tourists.

3.1.3 Adapting policy frameworks and appropriate measures

Finland is struggling with tackling climate change challenges which already implies continuously and significant increase of temperatures.

As policies mitigating climate change (CC) for farmers are mainly voluntary and therefore dependant on the willingness of farmers, their effectiveness remains limited. Only if measures seem profitable for them in an economic way they are accepted. Furthermore, there is a big discussion about dairy farming because of its contribution to CC (gases of cows – methane emission). Farmers are “blamed” to be highly responsible for CC in public debates and social media, no matter what they do or have done to improve/restrict methane emission (studies on how to feed animals to reduce gases, etc.). However, many of them have invested in the growth and profitability of their farms, which is counteracting current efforts to reduce CC. However, there is a broad agreement that (profitable) farms should be supported when applying environmentally friendly measures.

Peat production is another highly contested issue as its conversion is an important contribution to heating. Due to its high emissions of CO₂ it has severe consequences for CC. Another challenge is the land use after clearing peatland fields which needs a lot of time to recover (either into forests or wetlands).

The current new discussion refers to addressing increasingly the environmental challenges resulting from the intensification and structural adjustment process, and the desire to engage in an alternative support trajectory mitigating marginalization and supporting small-scale and remote land management practices. Although this is of very minor for production (quantity) relevance its local and regional implications for areas under threat of land abandonment would be substantial, and include a wide-set of (positive) side-effects for regions.

3.1.4 Conclusions and recommendations

With regard to policy implementation there is an ongoing discussion if and how to support non-profitable farms in remote areas. While profitable farms should be supported particularly with environmentally friendly measures there is a big discussion about the relevance of small and non-profitable farms for regional development aspects. On the one hand farms in remote areas are considered important for eco-system services (keep landscape open, biodiversity...), tourism and food security in coming years, on the other hand they need considerable amounts of financial support because the profitability is very limited. Thus, the discussion is mainly focusing along those lines, what kind of support is feasible in the European and national context.

The current national discussion is aware of being at a crossroad and seeking (through recently initiated discussions and studies) to address an alternative view on supporting those farms which cannot be included in the profitable pathways. In particular, for many remote areas and regions affected by challenges of land abandonment this is of particular relevance. This might be influential to the altered discussions of rural living spaces, increasingly addressing “rural” as residential areas, but those would build strongly on the amenity aspects shaped through a basic amount of diversified landscapes and land uses (Hämeenaho 2013).

Recommendations, both at regional and the national and EU level, have to address the balance between agricultural development and rural development opportunities of remote places, that are, like the CS Kainuu, particularly affected by limited production options, yet strive to provide attractive living spaces for their inhabitants (and visitors). The responses to the polarisation trends have to be sought actively and within a framework of cross-sectoral assessment of place-based strategies. Voutilainen and Wuori (2011) point to the specific challenges of this area in Finland and advocate a

specific focus on balanced policies that might affect marginalisation and consider the varying potentials of each rural region.

It should not be neglected that an important threat to natural areas can be seen in “excessive” development towards artificial areas. Though the share of those areas is very restricted in CS Kainuu, governance approaches for mitigation of land abandonment should be taken seriously and balanced as highlighted in the focus on the potential of such an approach in the “Kainuu experiment” (Purkarthofer and Mattila 2018).

3.2 Case Study Report: Murcia (Spain)

Country: Spain

Region: Murcia (NUTS 2: ES62)

Report by: Thomas Dax and Ingrid Machold

3.2.1 General summary of regional context, overview of land use and land use change

3.2.1.1 Summary of general context information

The region of Murcia is located in the southeast of the Iberian Peninsula with an extension of about 11.300 km². The area is quite hilly with plateaus (in the northeast), and plains (in the southeast), the highest peaks are in the northwest (reaching 2000 masl as maximum elevation). The climate is Mediterranean with semi-arid features, with scant rainfall (less than 350 mm p.a.) with the exception of some areas in the upper northwestern area (up to 600 mm). The average annual temperature is between 15°C and 19°C with very low probability of frosts during the short wintertime, while insolation exceeds 2800h per year. As a result of the climatic characteristics aridity of traditional agriculture imposes a clear contrast against rainfed and technologically advanced and irrigated agriculture. In 2018 56% of the region is covered with agricultural areas, mostly fruit trees and berry plantations (30% of the agricultural area), about 40% are forests and seminatural areas (mostly natural grasslands), 3.7% are artificial surfaces (see map).

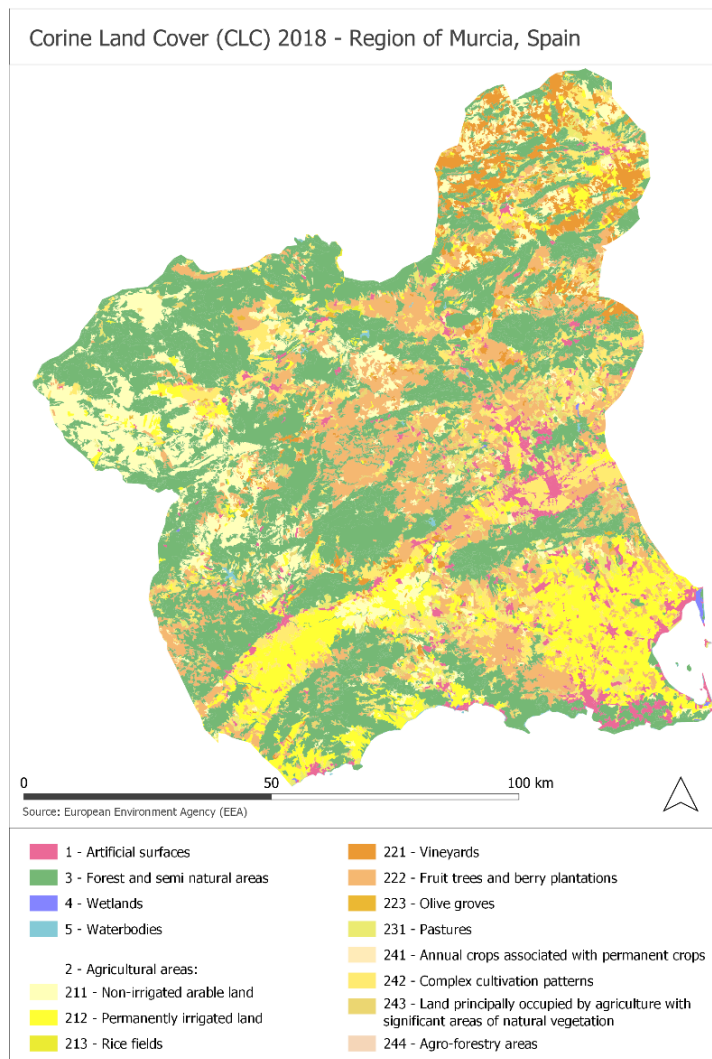
The region of Murcia is rather densely populated with around 130 inhabitants/kms², but with large differences among the municipalities. It is well accessible by road and train infrastructure and does not show substantial signs of remoteness of any kind. The port of Cartagena within the region is of high relevance for the export of agricultural goods, mainly to Central Europe.

Economically, agriculture in Murcia achieves particular importance with 13% of the regional employment (compared to just 4% for all Spain). Agriculture is thus a great motor of the regional economy because beyond farming itself it implies the development of the agroindustry, thus the regional economy is depending to a large degree on agricultural activities. Besides agriculture, tourism (primarily at the coast) as well as oil industry in the port of Cartagena is an economic driving force in the region.

Production conditions for agriculture are very good: good soils (neogene basins) and hardly any frost. The greatest challenge in the area is the low precipitation level, and despite this scarcity of rain irregularly but heavy short-term rainfalls pose a significant threat. This dry climate situation (for modern agricultural cultivation systems) is compensated by highly technified irrigation techniques. Water transfer is organized between the catchment of the river Tajo (in the “inner area” of Spain) and the river

system of Murcia (river Segura) which receives abundant amounts through a river-diversion scheme for irrigation purposes in this region. This allows (combined with the technique of plastic tunnels) 5-6 harvests a year (also during winter season) using also high amounts of fertilizers and chemical products.

Figure A.20: Situation of land cover in CS Murcia (2018)



3.2.1.2 Specific context information

Since the 1980s the water-transfer infrastructure is in function and agriculture gained rapidly in importance and corresponding farm structures “modernized” a lot. Within these natural conditions, agricultural success depends largely on the accessibility to water and/or the financial resources for irrigation technology. In those areas where water transfer works smoothly (and within financial limits) agriculture booms and is able to deploy its productivity capacity. Key to intensive agriculture are therefore large modernised and profitable fields with good irrigation infrastructure. Regional, traditional farmers have to become “business persons”, if they want to succeed. If that is not possible (due to age, missing successor, lack of money, no business vision, lack of skills, including business orientation skills) and in places where those changes cannot be realized land abandonment occurs and can be observed by long-term studies. Land abandonment occurs particularly in those parts of the region where irrigation is more difficult and expensive (in the driest parts of the region, in the North-East).

In this context, the aspect that land abandonment is not always a negative factor is very valid because of environmental advantages due to post-abandonment recovery of farmland. However, land abandonment should not imply land degradation or erosion processes which might turn out to show sometimes problematic developments. All in all, economic effects of land abandonment in this study area are not significant (farmers mostly retire or get another job) in the region.

3.2.1.3 Overview of land abandonment issues

To understand land use change, land abandonment and “land take”, i.e. the process of giving up land for agricultural and forest use and converting land into settlement and infrastructure uses (“artificial areas”), several important changes in the past were key moments to change and the current situation in Murcia (Pérez Morales et al. 2016, Alonso-Sarría et al. 2016). A short summary on these identifies the following crucial elements:

- (1) In the 1960s, when Spain changed from an autarchy system to a liberal economic system with industrial development, urbanisation and rising tourism as key sectors in developing a competitive economy. One of the consequences at that time were increased rural emigration and agricultural land abandonment. Although land abandonment has been a characteristic process in the Spanish agricultural evolution since the end of the 19th century, it reached its highest intensity during the 1960s and 1970s of the 20th century (Alonso-Sarría et al. 2016).
- (2) The establishment of the water transfer system from inner Spain areas (river Tajo) to Murcia (river Seguro) profoundly altered the agriculture in the region. Irrigated agriculture (with a focus on fruits and olive trees) replaced predominantly dryland agriculture and led to reallocation of agricultural production from more humid areas in the north to semi-arid areas in the south and southeast. Thus, for the individual decisions of farmers and choice of a specific management system the disponibility of water is crucial and turned to be the key factor for agricultural success.
- (3) Water from the water transfer system also facilitated construction industry and the expansion of urban-tourism and touristic residents, particularly since the second half of the 1980s.
- (4) In the second half of the 1990s the construction boom in Spain based on the low cost of borrowing money and the expansion of second home ownership (from whole Spain and foreign) led to a new housing boom, lasting until the global financial crisis in 2008. Many farmers sold or rent their former agricultural fields to multinational companies for construction and industrial uses. Starting with tourism facilities predominantly on the coast, construction of new residential properties and resorts expanded later on further inland where it occupies more and more agricultural landscapes. Construction activities (besides residential areas, industrial sites, infrastructure, including also the road network) led to a high percentage of soil sealing in areas where previously traditional agricultural practices used occasional flood water, and increased the exposure and vulnerability of the population to flooding. Soil sealing in the area seems to be a problem of a much bigger dimension since there is a vast increasing area of greenhouses in the case study which is estimated to cover more than 30 km². This leads to a situation that the sealed area represents about 16% of the total area in the coastal zone of the Murcia region, contributing through its location in the riverbeds to a drastic increase in the thread and frequent occurrence of floods in recent years (Pérez Morales et al. 2016, 101f.).

Even if environmental challenges become more and more visible there is no significant discussion and change to alter the predominant intensive agricultural system and/or to achieve a fast change in

settlement and intensive tourism uses. However, due to contamination and ecological harmful trends the need to address these challenges is rising in the mid-term.

Aside from regional and national discussions about intensification and land use changes the risk of agricultural abandonment in the region of Murcia is projected to be high, also compared to other regions in Spain (Perpiña et al. 2020). Together with other semi-arid regions in the south-eastern part of Spain (e.g. Almería, Granada, Málaga) particularly biophysical factors (such as high salinity concentration, low annual precipitation, fragile and poor soils) combined with accelerated urbanization and anthropogenic processes as well as low population densities in the mountain are responsible for this high risk estimation for agricultural abandonment.

3.2.2 Information on drivers and effects

In the region of Murcia two main triggers impact on land use and decisions for stability or change of management systems. These changes either underpin intensification processes aiming at the extension of a highly competitive land management system (with severe harmful environmental effects) or disintensification and land abandonment in areas where framework conditions for intensification are not accessible (see García-Martín et al 2020, for dual development prospects of landscape change across Europe): Huge agricultural productivity due to good conditions for intensive farming competes with housing pressure of second home owners and a strong thriving tourism sector, particularly in the coastal areas, but also in parts of the inner areas of the region.

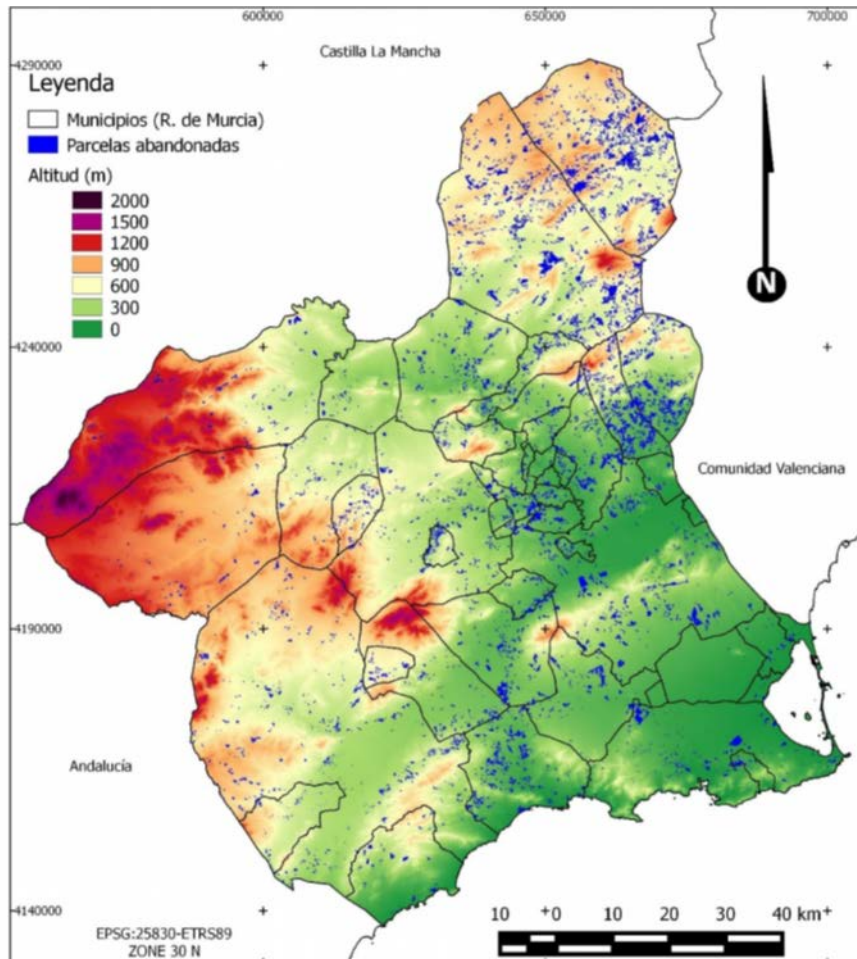
The issue of land abandonment is therefore not in the forefront of discussion in the region. A major driver for agricultural land abandonment or land use change is the increase of sealed areas, changing from agricultural areas into urbanized ones (including houses, industrial sites, roads, etc.): Between 2006 and 2012 about 5.500 ha changed from agricultural areas into artificial surfaces (the loss of 0,9% of agricultural area refers to the second home and residential boom before 2008), between 2012 and 2018 this change almost disappeared (with only 449 ha). At the more distant areas, which are not included in the water transfer system, gradual abandonment occurred due to persistent difficulties of “non-commercial” farm households (particularly in periods of generational change or other basic farm decisions).

Furthermore, the intensified agriculture is dependent on modern irrigation techniques and high financial resources per hectare (Alonso-Sarría et al. 2016). So, even if many agricultural areas are overexploited mainly in the Southeast of the region (see Figure A.20) which highlights also the high amount of irrigated areas in the CS, which has increased significantly during the past time periods), other areas show significant signs of land abandonment. In his thorough analysis of the causes and consequences of land abandonment in the region of Murcia, Martínez-Hernández (2017) identified an amount of 4% (24,522 ha) of the total farm land as abandoned (analysis of orthophotos from 1981-2007). See locations of the observed land abandonment process within the CS Murcia in Figure A.21. It appears that most cases of abandonment occur in the North-East of the CS and on the foothills of mountain areas where this process is strongest due to the incapacity of those zones to integrate into the intensive irrigation production system.

For the following period 2007-2013 a rough estimation is available indicating that about 90% of that abandonment land was still abandoned 6 years later (and the gradual process was going on for other areas). This underscores the assessment that abandonment is a very “fixed” situation, in general it is not reversed and it hardly accelerates over time. The underlying assessment is mainly derived from observations over the periods mentioned above.

The causes for abandoning land are related to the scarce rural population and the specific agricultural context with a highly mechanized agriculture that requires well-trained workers, intensification of irrigation and production, business concentration, crop diversification and over exploited soils. These regional causes are affecting the local farming conditions which are furthermore determined by the (non-)accessibility of irrigated water and therefore their dependence on rainfed agricultural systems. The presence of slopes or otherwise land less appropriate for agricultural use (lithological situation and soil conditions) are also mentioned as local drivers for land abandonment.

Figure A.21: Land abandonment in CS Murcia (1981-2007), according to altitude



Source: Martínez-Hernández 2017, 126.

Socio-economic causes refer to the increase of production costs, speculations in terms of land sales or lease, small plot sizes, out-of-date production methods and retirement without professional succession.

3.2.3 Adapting policy frameworks and appropriate measures

In the 1990s there was just one interesting and effective policy instrument applied, i.e. the agri-environmental measures (AEM) that served as incentive for farmers not to continue intensive cultivation of specific areas because of environmental reasons, which showed beneficial environmental effects (though on a rather small scale only). However, the effect on biodiversity recovery was very high in the respective fields because application was targeted at specific natural areas and recolonisation worked according to this very well.

In general, this was hardly an instrument set in the framework of “land abandonment” discussion, but rather aimed at ecological recovery.

The regional discourse is hardly oriented at measures providing support to farms in the context of less-favoured areas and with the aim of halting ceasing of agricultural activities in the process of generational renewal or more generally preserving the extent of land managed in these parts of the region threatened by marginalisation processes.

Hence, even if several of the CAP measures might deploy effects (against land abandonment trends) in the area these are of minor share within the overall support scheme and the policy orientation within the region.

Much more weight has been put on land planning schemes which are the responsibility of the region (of Murcia) set within the framework of general state directives. For the CS we can observe a first set of relevant land management rules starting from 2005 onwards, seeking to limit the rapid expansion of artificial zones to vast areas at the coast of the region (expert interview ES02). However, at that time it did not include any view for sustainable spatial development and implied a continuing of second home development, intensification of agriculture (in certain zones) and brought about increased infrastructural development. All in all, this had no positive effect on protecting endangered areas from flooding threats. Only very recently, since 2018, due to three major flooding in previous years, the policy strategy changed drastically. Now, it is particularly aimed (i) at controlling agricultural activity to respect the water channels that are crucial to cope with flooding situations, and (ii) addressing the issue of contamination in the lagoon which became a rising environmental problem and concern.

In terms of tackling the fundamental causes of land management development, no short/medium term changes are visible. On the contrary, there is hardly any political will to change the predominant production model, and moreover, influential international commercial enterprises support the current situation and are powerful agents for protecting the status-quo. It is hence a lack of awareness for the required changes which is encountered in the CS with regard to the challenges faced by the highly interlinked socio-economic and ecological causes to tackle current threats of land development in the CS.

3.2.4 Conclusions and recommendations

A comprehensive study of the elements and effects of land abandonment is highly demanding and hardly achievable without detailed data and area-specific information. In the CS Murcia, the present study could rely on intensive investigation of both the agricultural land abandonment issue due to marginalisation of small and traditional farmers outside of the intensification zone of the region (expert interview ES01) and the detailed account of “land take” observation through spatial planning experts highlighting the intensive construction boom, tourism intensification and infrastructure development across parts of the region (expert interview ES02).

While existing policies are even assessed as having contributed to the dual development of agriculture, fostering irrigation and competitiveness of intensive land management systems, and spatial planning regulations also (for a long time) favoured settlement and construction to increase economic growth in the coastal zone, environmental concerns over harmful effects are emerging.

Relevant policy recommendations cannot be oriented only to one part of the area or the challenges occurring across the region as trends and future pathways are closely inter-linked. The CS Murcia is in this perspective characteristic for a strong development of land take which requires a radical change from the mainstream production logic to address implied ecological threats. On the other hand, local and regional actors are mindful of more marginalized areas in the region which only might elaborate a more promising development strategy if the dichotomy towards intensive production areas could be

tackled. Emerging discourse and local strategies would be some arguments for a change in this direction, particularly integrating environmental concerns and strategies that favour ecological recovery and biodiversity development.

Expert Interviewee ES01 concludes “that trends should be towards a more sustainable management of agricultural land, promoting abandonment in some particular cases and, when necessary, subsidizing the maintenance of conservations structures” (Martínez-Hernández 2017, 543). This view engages in a very differentiated approach, urging action for “renaturalization” and “soil conservation”, and even in some cases for “natural evolution”. However, aspects of socio-economic effects of abandonment of farm holdings have to be taken seriously and viewed in combination to these environmental effects. In particular, it calls for a “management” of abandonment which is so far non-existent.

3.3 Case Study Report: Podlaskie (Poland)

Country: Poland

Region: Podlaskie NUTS 84 (NUTS 2018 – previously NUTS 34)

Report by: Martyna Derszniak-Noirjean

3.3.1 General summary of regional context, overview of land use and land use change

3.3.1.1 Summary of general context information

Podlaskie Voivodeship is a NUTS 2 region (PL84) located in Eastern Poland, at the border to Belarus. It is characterized by flat lands with a large percentage of rural and green areas. It is famous for Białowieża Forest, one of the oldest unspoiled European forests, located within its territory. Its biggest city is Białystok, with nearly 300,000 residents. Podlaskie is regarded as one of the Polish regions with high quality of the environment; never the less climate change poses significant challenges for maintaining this status.

The region and particularly its rural areas are not well connected in terms of transport network. It is a peripheral region and the authors of the development strategy claim that improving the road network is not a national priority due to lack of particular interest in improving connectivity with neighbouring Belarus. As a result, it can be said that rural areas suffer from remoteness. However, the two biggest cities, Białystok and Łomża, are located approximately 200km from the capital city Warsaw and are relatively well accessible within 2-2,5h by car. It is a relatively sparsely populated region both in the Polish and European context².

Data from Białystok Statistical Office indicates the following characteristics:

- In 2018, the natural increase per 1000 inhabitants was negative and amounted to -1,00.
- In 2018, also the total net migration (including internal and international migration) per 1000 population was negative and amounted to -1,70.
- The forecast for population in 2050 is also negative. According to the calculations of the statistical office, the population will decrease by about 186,000 between 2020 and 2050 which is approximately 16% of the 2020 population (1,168,229).

² See <https://stat.gov.pl/obszary-tematyczne/inne-opracowania/miasta-województwa/atlas-statystyczny-województwa-podlaskiego,23,1.html>

- The unemployment rate in the region for 2018 was 7,7% which was higher than the national average by almost 2% (national average 5,8%). Regions in the northern part of the voivodeship recorded higher numbers reaching 12% or higher³.
- Persons employed in agriculture in Podlaskie amount to 30% of total employed persons, a figure which goes beyond the Polish average of 12% and EU's 5%.
- The tertiary sector is the largest contributor to the regional GVA (62-65%), followed by the secondary sector (30%) and the primary sector (5-8%). The GVA of the region's primary sector lies between €500 million and €600 million.
- In 2015, Podlaskie registered 4th lowest GDP per capita among Polish regions. It also has one of the lowest GVA values as well as numbers of registered enterprises.

3.3.1.2 Specific context information

Particular drivers of land abandonment: remoteness and depopulation which is linked to lack of generational renewal as a result of economic laggardness and unattractive life quality in the rural areas particularly for young persons.

Podlaskie is characterized by dominance of agriculture in the regional economy, low entrepreneurship and innovativeness which contribute to economic laggardness, ageing society and brain drain. These phenomena all contribute to decreasing attractiveness of the region, which translates to lower interest in employment in farming.

From the perspective of farmers, high environmental protection status of many areas in the region and poorer climate than in the South of Poland are big obstacles to farming.

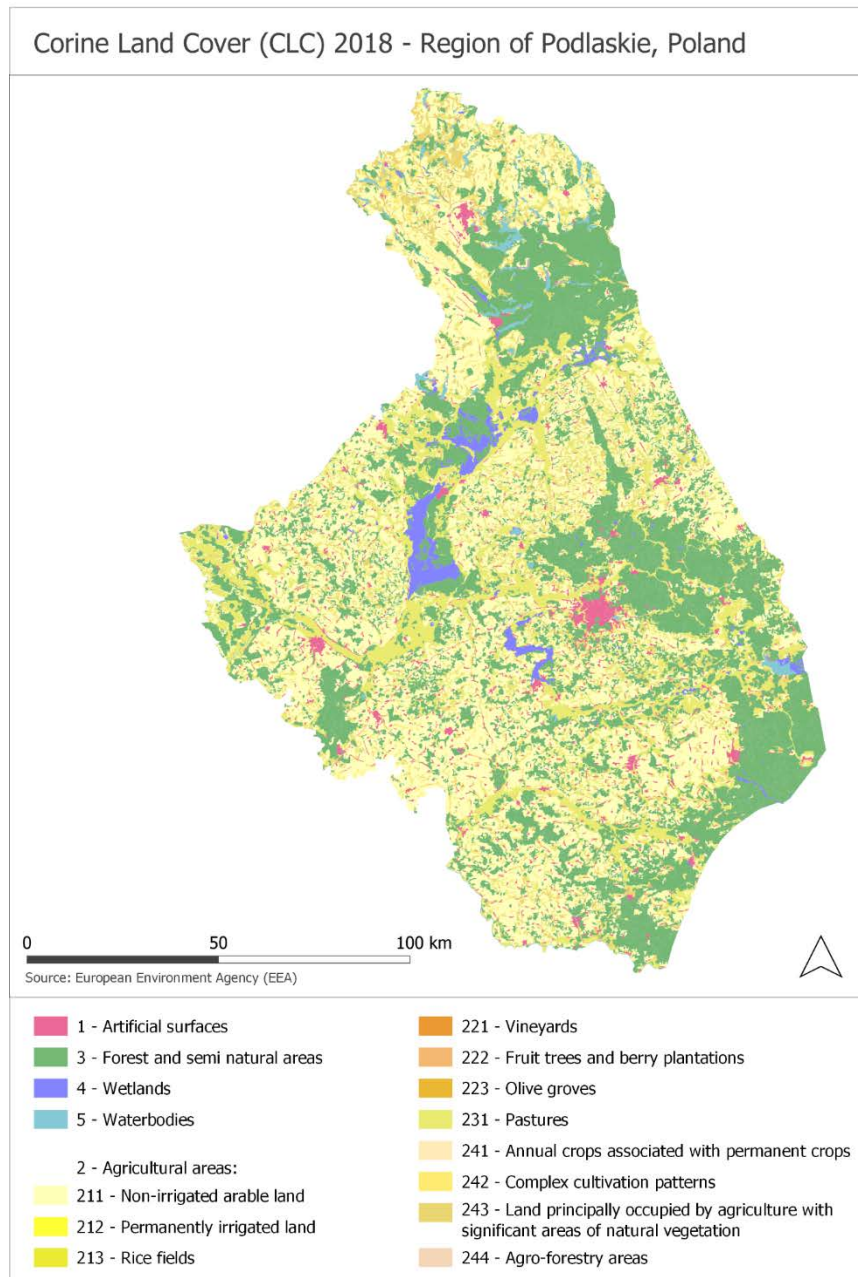
According to interviews, the problem is that farmers "trick" CAP payments and they are only "farmers on paper". They cease agricultural activities only unofficially but they keep official the ownership of the land as agricultural in order to receive CAP payments. In effect, areas are abandoned and turn to wild areas but CAP payments are anyway taken by their owners.

Environmental effects of such abandonment are rather negative, according to the interviewee.

³ Data from Bialystok Statistical Office:
https://bialystok.stat.gov.pl/files/qfx/bialystok/pl/defaultstronaopisowa/1395/1/1/w_stopa_bezrobocia_rejestrowane_go_3.pdf

3.3.1.3 Overview of land abandonment issues

Figure A.22: Corine Land Cover map 2018, Region of Podlaskie



With regards to UAA change, unlike in many other Polish regions, the UAA decrease has not been reduced in the period 2012-2018 as opposed to 2006-2012. In both periods, it remains at the -15-0% level.

With regards to CLC change from agricultural areas into artificial surfaces, in Podlaskie there has been little change in period 2006-2012 and 2012-2018. However, there is an increase observable in the period 2012-2018 as opposed to 2006-2012 with regards to CLC change from agricultural to natural surfaces. This suggests that land abandoned in Podlaskie is not utilised or turned into artificial surfaces but turns into natural areas.

According to JRC calculations of the risk of land abandonment, Podlaskie is one of the most affected regions. Its sub-regions have high to average risk of land abandonment. This is likely due to poor socio-

economic indicators included in the calculation of the risk of land abandonment, particularly poor agricultural viability and population and regional context (such as life quality in rural areas, depopulation and low income levels in agricultural activity linked to economic laggardness of the region).

3.3.2 Information on drivers and effects

Drivers⁴

Marginalisation is feared to lead to economic polarisation tendencies. With an increased focus on knowledge economy and knowledge society, agricultural regions such as Podlaskie struggle to find support for making use of their particular strengths and economy structure. The regional development strategy suggests that the national policies is unfavourable for the region as it does not prioritise better connections and exchange with neighbouring Belarus.

Economic laggardness: The regional development strategy observes that Podlaskie belongs to one of the poorest EU NUTS2 regions and it is also one among worst-performing Polish regions in terms of socio-economic indicators. Total GVA is well below Polish average, except for the agricultural GVA. The Voivodeship has one of the lowest brutto salaries compared to other Voivodeships as well as an unemployment rate above the national average. The regional OP suggests that the negative situation of the regional labour market is due to the dominance of agricultural jobs as persons. Its focus on agriculture and lack of diversified economy leads to low incomes, increasing unemployment and lack of attractiveness of the region. In order to counteract economic laggardness, the region invests in diversification of the economy which may potentially contribute to abandoning agricultural activity. At the same time, the region is aware of its agricultural potential and simultaneously aims to strengthen employment in farming by increasing life quality in rural areas, investing in innovation in agriculture, promoting branding of local products and culture, organic agriculture and agritourism.

Life quality in rural areas is affected by poor transport network and deficiencies in the provision of services of general interest (SGIs). There is a poor overall attractiveness, employment and quality of life in Podlaskie's rural areas both for young and elderly population.

Depopulation and generational renewal: There are negative trends in terms of natural increase, internal and international migration and the projected population numbers are negative as well. The projections are based on a continuously decreasing number of residents of the voivodeship. This phenomenon reflects that young people decide to leave rural areas and relocate to cities both within and beyond the voivodeship. According to interviews, generational renewal problems also have to do with generational conflict as sons have to wait too long to take over from fathers. In many cases, parents discourage children from becoming farmers.

Environmental and climate threats: Bialowieza Forest, which is one of last remaining parts of primeval European forest, as well as other protected areas including many NATURA 2000 sites are located in the region. The region has one of the highest shares of NATURA 2000 and one of the highest shares of protected areas among Polish Voivodeships. Running agricultural activity in surrounding of highly protected areas can be challenging due to restrictions and presence of wildlife. For example, bison or wolves that attack cows which is a more and more frequent problem. This is particularly important because the voivodeship is famous for milk production. Frequently, due to the danger from animals,

⁴ Adapted from European Parliament (2019) The EU farming employment: current challenges and future prospects, Annex B, Case studies.

farmers cease agricultural activities. Also the climate is less favourable for agriculture: vegetation period is shorter by 21 days as compared to southern regions

Bankruptcies have to do with changing economic situation (making debts when there is money) and lack of managerial skills. Farmers are encouraged by advisory services and CAP measures to make huge investments, e.g. for buying machines (instead of buying cheaper or sharing with other farmers) and develop extensive depts. Then, they have debts that they cannot afford.

Effects

Environmental effects are rather negative. Abandoned areas, even in farms where farmers still take payments, are becoming wild and unproductive. They are sometimes, once at the end of summer, taken care of when controls take place. But such land becomes neither truly wild, nor good and fertile for agriculture. Such land takes much time and effort to be used for farming again.

This is also the case when land is not used at all (not taken care of even yearly) but becomes forest. In order to become truly wild and to become habitat to species and to foster biodiversity, it needs to stay wild for decades. Plants that are growing in abandoned areas are good neither for people nor for ecosystems. Animals do not eat it and birds do not want to settle there. It does not contribute to ecosystems.

Lands that were previously cultivated by humans cannot be suddenly left on their own because they have already been modified by humans. In such cases, humans have to take the responsibility to make them suitable for ecosystems again.

3.3.3 Adapting policy frameworks and appropriate measures

Strategies and measures at the regional level, i.e. ERDF Regional Operational Programme Podlaskie, RIS3 Podlaskie, Regional Development Strategy (regional policy document), aim at supporting technical innovations in agriculture and the agri-food sector, export of processed foods, supporting development of organic agriculture, food processing and eco-innovations, supporting professional activation and vocational conversion of persons leaving agricultural employment.⁵

Strategies and measures at the national level: Rural Development Programme (CAP Pillar II), Strategy for Sustainable Development of Rural Areas, Agriculture and Fishing 2030 (national policy document). These aim at: restructuring, productivity and effectiveness of agricultural businesses; Measures supporting restructuring of small farms; Bonuses for young farmers who expand or open farms (Young Farmer); Supporting of agriculture-related activities and pluractivity, diversification of income sources; Support of non-agricultural investments, such as entrepreneurship; Supporting quality of life in rural areas, adjusting employment and job market to demographic changes, counteracting brain-drain; Supporting training and professional activation.

The most important measures of the Rural Development Programme funded by CAP Pillar II are listed below⁶:

- Young Farmer: until the end of 2018, there were as many as 988 beneficiaries of the project in Podlaskie Voivodeship, which is the fourth highest number among all voivodeships
- Assistance in opening non-agricultural business activities in rural areas (Measure 6.2 of the RDP) applies to farmers who have sold or otherwise disposed of their agricultural land, ceased

⁵ Adapted from European Parliament (2019) The EU farming employment: current challenges and future prospects, Annex B, Case studies.

⁶ According to The Agency for Restructuring and Modernisation of Agriculture data (2019).

agricultural activity and opened a non-agricultural business. Until the end of 2018, there were 62 beneficiaries of this measure, a value which is not particularly outstanding in the context of other Voivodeships (8th place among 16 voivodeships).

- Assistance for opening activities that support development of small farms (Measure 6.3 of the RDP) supporting farmers who undertake activities that contribute to modernising small farms that will contribute to farm growth or agricultural specialisation. Until the end of 2018 Podlaskie has had 495 beneficiaries of this measure, which is a 7th place out of 16 voivodeships.

Similarly, ANC is very important but the region has been “punished”, according to the interviewee. The amount was reduced because of improved soil quality. The soil quality has improved because farmers have been using manure for soils and because of this, instead of being rewarded in some way, the ANC payments were reduced.

According to interviewee, agri-environment-climate actions are promoting leaving land alone which does not have any good environmental or biodiversity effects. It also encourages farmers to cease agricultural activity.

Advisory services were evaluated to encourage too much risk that promotes lack of prudent planning among farmers. Interviewee suggested that they should not be advising farmers to invest irresponsibly and make debts which they may not be able to pay off if the economic situation changes. Investments should be smart- for example for sharing machines or not buying most expensive machines.

In general, the effect of EU policies has very mixed impact. On one hand they slow down land abandonment because they allow those who want to continue farming. On the other hand, they encourage others to benefit from payments without undertaking agricultural activities. They should be designed in a smarter way. For example, they should not only be paid out based on the size of the farm but also favour those who produce more. Also, they should promote local value chains, farmers who produce and sell locally, irrespective of their size. Moreover, CAP allocations should be better adjusted to regions and regions should decide more on these allocations.

3.3.4 Conclusions and recommendations

Valid for local, regional, national and EU authorities

Since many farmers cease agricultural activities because they do not want to invest into farming, despite taking CAP payments for their land, viable alternatives should be provided for such persons. The region should find the balance between maintaining and supporting agriculture and other activities that support other economic sectors as well as supporting farmers and rural population. In this context, it is perhaps important to make sure that payments should be clearly and transparently separated for farmers who actually contribute to agricultural productivity and for those who do not but depend on such money. Payments should not be entirely stopped even in cases when farmers do not undertake agricultural activity as such payments, even if not alleviating land abandonment, significantly increase the wealthiness of rural population. This finding calls for a more transparent and smarter allocation of CAP funds that actually meets the reality. This requires that regional and local authorities should be more involved into the process of deciding on the allocation rather than all decisions being taken at the national level.

The effectiveness of specific CAP measures/instruments can be improved. For example, advisory services are also said to encourage too much risk that leads farmers to bankrupt.

Valid for mostly local and regional authorities

Land abandonment can have positive effects when there is low agricultural productivity. In such cases, it may indeed be smart to support other economic activities and, for example, encourage larger and more productive farmers to take over this land. Such cases have to be identified by local authorities, managed and supported respectively.

Investments into rural areas and SGIs maintain high life-quality standards which may encourage continuation of agricultural activities as opposed to leaving land and moving to urban areas.

Environmental effects of land abandonment do not necessarily have positive effects on biodiversity. The interviewee has argued that land that has previously been altered by human cannot simply be left alone. It requires human intervention to rebuild ecosystems, control settling of species and alien species, etc. "Rewilding" of abandoned areas can only have positive environmental effects if it is controlled by humans.

3.4 Case Study Report: Tyrol (Austria)

Country: Austria

Region: Tyrol (NUTS 2 area: AT33)

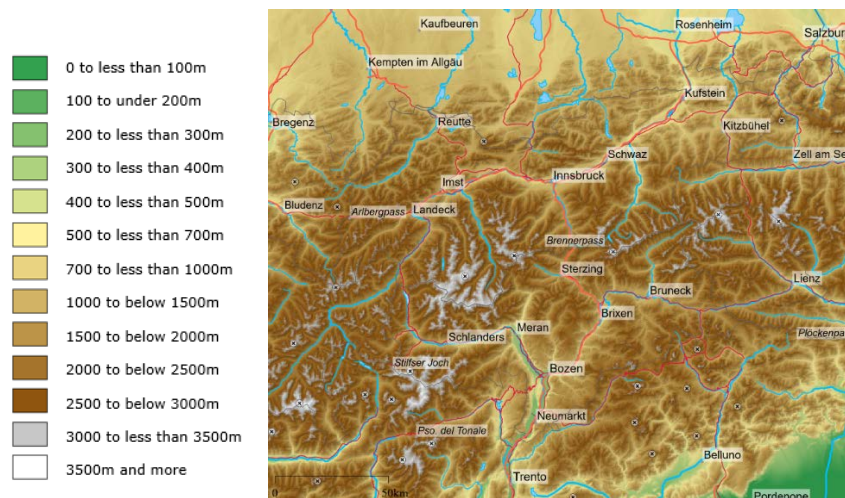
Report by: Mailin Gaupp-Berghausen

3.4.1 General summary of regional context, overview of land use and land use change

3.4.1.1 Summary of general context information

The Austrian federal state Tyrol is characterised by alpine climate and terrain. Most of the area lie over 500 meters above sea level (Tyrol Atlas, 2019).

Figure A.23: Altitude (metres)

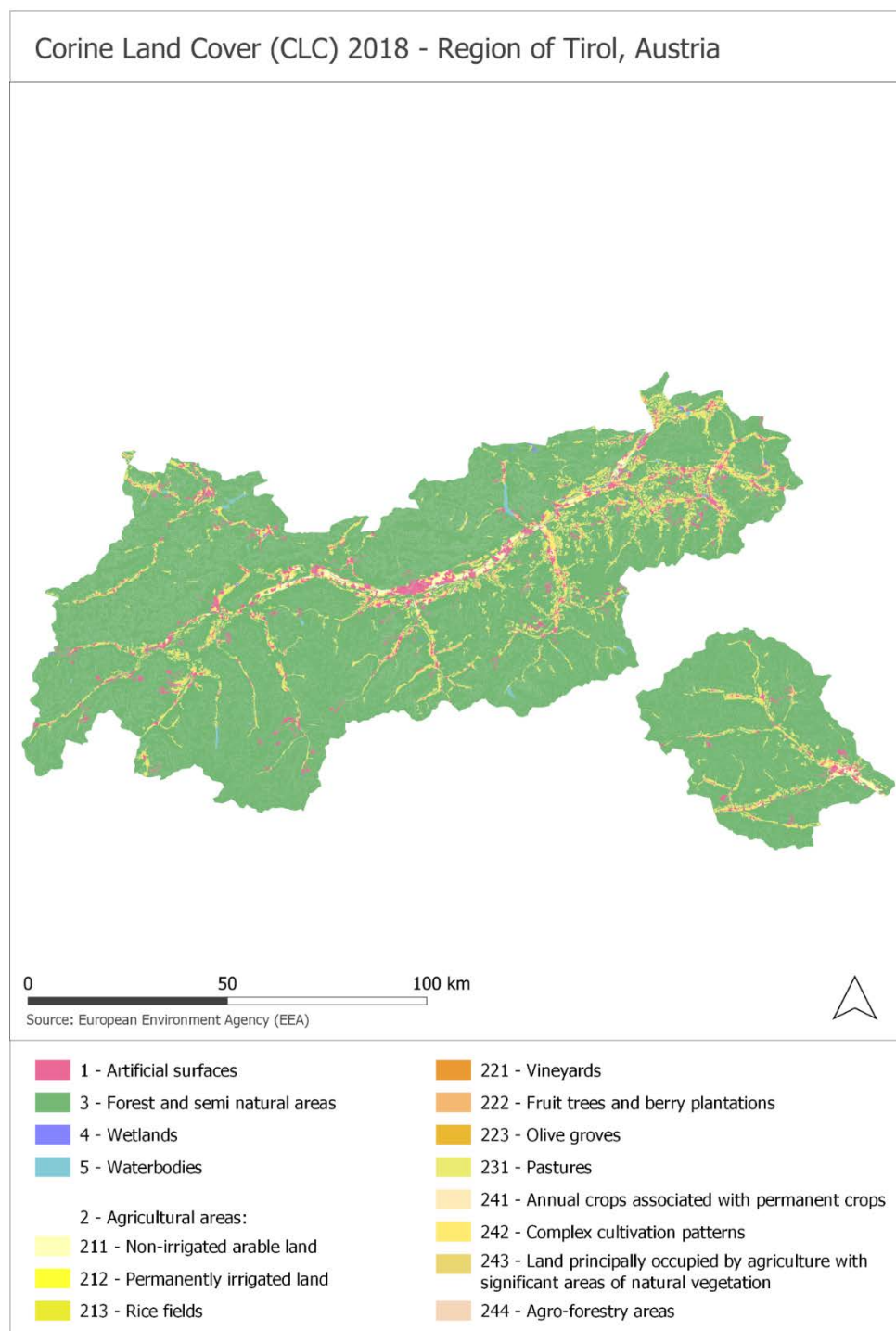


Source: Tyrol Atlas, 2019

Tyrolean farmers are confronted with various natural production difficulties such as steep slopes, and a short vegetation period especially in the mountains and remote locations of Tyrol. Only 12.7% of the total area is well settleable (Interview, 2020).

The following map shows the land cover (CLC, 2018) for Tyrol. As can be seen from the map, most areas are characterised by forests and semi natural areas.

Figure A.24: Corine Land Cover, 2018 – Tyrol, Austria



The state of Tyrol is a transit land for trans-European trade over the Alps. Innsbruck, the capital city of Tyrol, is located along the highway corridor and has the most important railway station in the state of Tyrol. More than 40% of the Tyrolean population lives in and around the provincial capital. (Tyrolean regional government, 2019)

By the end of 2018, 754.705 people lived in Tyrol (share of female: 50.7%, share of male: 49.3%). Most people live and work in the NUTS-3 regions AT332 (Innsbruck) and AT335 (Tyrolean Unterland).

Whereas Tourism plays an important role in Tyrol, only 5.7% of the Tyrolean workforce is employed in the agricultural sector. GAP instruments (Pillar I) and measures (Pillar II) are important sources of income. Especially, the Single Area Payment Scheme (SAPS) and the Green Payment make up a large part of the funding amount. Under Pillar II, payments such as the “Austrian programme for the promotion of an environmentally-compatible and extensive form of agriculture that protects the natural living spaces” (*Österreichisches Programm für umweltgerechte Landwirtschaft, ÖPUL*) with organic farming and animal welfare measures and the compensatory allowance (Ausgleichszulage, AZ) for farms in disadvantages mountain areas play also an important role. (Tyrolean regional government, 2019)

3.4.1.2 Specific context information

Management of Tyrolean agricultural area is, according to the interviewee of the Tyrolean government, more or less stable. However, with regard to (potential) land abandonment or loss of agricultural areas, a distinction must be made between agricultural areas located in mountainous regions (alpine pasture) and those located in favoured locations. Farmers situated in mountainous areas are confronted with various locational constraints (such as steep slopes, remote fields, high share of part-time employment, increasing occurrence of predators – especially wolves, poorer access to social and economic infrastructures, etc.). As only extensive farming practices are feasible, managing of these areas are not efficient in economic terms (i.e. low yield versus high (personal) management costs). Farmers, on the other hand, located in favourable locations are less confronted with the risk of land abandonment. Due to the very small amount of land in favourable locations, however, they are in strong competition with other forms of use (especially settlements, industry, roads).

3.4.1.3 Overview of land abandonment issues

A variety of socio-economic reasons has influenced the high share of part-time employed farmers (especially in the mountainous regions of Tyrol), which are mainly confronted with the risk of land abandonment. Different regional hereditary habits had considerable effects on the rural economic structure, which can still be seen today. Whereas in the East of North Tyrol, the entire farm was handed over to just one heir, partition of real estates (especially farms) was mainly a phenomenon of the western parts of Tyrol (e.g. in Außerfern). This different inheritance situation resulted in different large property areas of cultivable land among Tyrol. As a result of the economic growth after the 2nd World War, many farms were transformed from full-time to part-time managed farms, as additional job opportunities emerged. The structural change was particularly noticeable in the 80s of the last century, as disparities (especially among mountain farmers) became increasingly visible. Under the Kreisky government special national subsidies were established to support farmers in mountain areas. (Schermer, 2020 – personal interview).

Farmers who work on a part-time basis are, according to the interviewee of the Tyrolean government, confronted with a “double burden”. It is doubtful whether future generation will takeover the family farm.

3.4.2 Information on drivers and effects

Drivers

Various drivers might lead to land abandonment in the future:

One of the most important factors in **favourable locations** is the pressure, which occurs due to conflicting land-use interests (agriculture versus settlements, industry and roads).

In **mountainous regions** various drivers exist, which endangers the continuity of agriculture:

- As only extensive farming is possible, the agricultural productivity is very low. Farmers are therefore dependent on additional income sources (e.g. funding schemes).
- Typical agricultural structures are characterised by part-time farming. This leads to lower labour productivity on the farm itself.
- The modern employment systems demands a high degree of flexibility. This is difficult to reconcile with the structured work flow of agriculture.
- Even if there is a rising number of people with no-farming background who are interested to manage or take over a farm, they are still facing many problems (e.g. financial issues, prejudices).
- The accessibility of public services (e.g. post offices, doctors, grocery stores) is a general problem in rural and remote areas. In addition, there is often a lack of social meeting points (such as bars and restaurants, facilities for young people), which would make these areas more attractive.
- The regional economic performance (especially triggered by other sectors – such as tourism) is an important factor. Especially, if those in part-time farming are able to find work in the surrounding area. Summer farming and winter tourism can be well arranged with each other.
- Various policy support schemes play an important source of income. Especially measures comprised under ÖPUL (especially M10, M11, M12) and Payments for areas facing natural or other specific constraints (M13) of the GAP are perceived as important (Schermer, 2020 – personal interview).

Effects

Ecological effects: The ecological consequences of land abandonment are perceived by the interviews as serious – especially in a mountainous region like Tyrol. The vulnerability to natural hazards would increase (e.g. increase of landslides, higher water loss).

Economic effects: The pressure on land-use in favourable location endangers the food production. To prevent a loss of good agricultural soil, a good spatial planning policy is essential. Tyrol as a tourist destination depends also on the landscape (e.g. alpine pasture). Tourism (one of the most important economic sectors in Tyrol) could therefore also be negative affected from land abandonment.

Social effects: (Building) land has become very expensive due to the competition for space in the favoured locations. Young people (including farmers) can almost only obtain land through inheritance.

3.4.3 Adapting policy frameworks and appropriate measures

Only a small share of Tyrolean's work in the primary sector. Compared to many other regions in the EU, farmers in Tyrol are confronted with a number of natural production difficulties such as steep slopes, a short vegetation period – especially in the remote mountainous regions – , and a very small share of areas located in favourable locations.

As mountain farming protects the area from scrub encroachment, their work has been recognised to preserve the typical alpine landscape. For this reason mountain farmers receive support within the framework of the promotion of landscape conservation measures.

The following list of policy measures are described as being effective:

- **Common Agricultural Policy (CAP):** most important support derived from CAP Pillar I are the instruments Basic payment scheme (BPS) / Single area payment schemes (SAPS) and the

Voluntary Couple Support (VCS), and from Pillar II measures comprised under ÖPUL (especially M10 – agri-environmental-climate, M11 – organic farming, M12 – Natura2000 and Water Framework Directive payments) and the so-called compensatory allowance (M13 – payments to areas facing natural or other specific constraints). The VCS is relevant to maintain the livestock population on the alpine pastures. The compensatory allowance are – especially for mountain farmers – an important source of income. Payments derived from CAP are further essential to address other objectives such as climate change mitigation, biodiversity enhancement, and soil protection. Further, Tyrol use the LEADER/CLLD method as an integrated approach, which means that all EU and national programmes related to local development are managed through local action groups (“one-stop-shop”). LEADER fosters regional cooperation, inspire innovations and prevent people from “feeling left behind”. Also the Austrian master plan (BMLFUW, 2017) for rural areas (financed by CAP) supports people in remote areas by improving the economic and living conditions for these people.

- Other EU policies and instruments relevant for the Case Study of Tyrol in this regard are:
 - the European Regional Development Fund (ERDF) and the European Social Fund (ESF). ERDF supports social and economic cohesion and therefore reduces disparities between regions.
 - the INTERREG-programmes that promote cross-border cooperation with Germany and Italy, as well as transnational cooperation’s in the Alpine Space (Tyrolean regional government, 2020)

3.4.4 Conclusions and recommendations

The following list summarises the recommendations mentioned by the interviewed experts:

- Change in terminology is needed. If farmers protect alpine areas from scrub encroachment they should receive a payment for their “service” and not a “fund”.
- For farmers to “survive” in the long run, a certain settlement density is essential. Other income opportunities must be available in the local area (especially for part-time farmers).
- Part-time farmers have a double burden. Part-time work should increasingly be converted (back) into full-time work.
- Predators (especially wolves) pose an increasing threat to pasture animals in mountains. The problem is already very emotionally charged. Objective scientific opinions are necessary. This should also be considered in the FFH guideline.
- More studies are needed to assess land abandonment. Farmers should be actively involved in various processes (such as monitoring and development measures).

Negative development factors that affect land abandonment are summarised by the interviewee of the university as market and technological changes, and also stricter regulations for biological farming. Especially regulations that increase animal welfare (like the provision of daily access to pasture) or intensification processes (due to technological changes) force especially part-time farmers to reduce alpine management. Part-time farmers are further very much dependent on the development in other sectors (like tourism or industry). If these sectors decline they will lose an important source of income. To benefit from the entire value chain it is therefore important to close the regional production chain. The interviewed experts agreed that the CAP is important for farmers as they provide a stable income source. Especially the area-based payments (from Pillar I) that are paid out on an annual basis provides a stable income-source. However, as this support is based on the size (i.e. hectares of fields), mainly large farms located in favourable locations benefit from it. In contrast, measures from Pillar II are described by the interviewees as being better designed to reach the needs of farmers in mountainous

regions, where only extensive farming is possible. In general, farming in Tyrol (especially small farms located in mountains) depends largely on financial support. Especially in regard to generational renewal, financial support signals to young people that their decision to work in the primary sector is appreciated. Cutting the funds could either result in downsized farms or a shift of work into other sectors – which would both have a negative effect on land abandonment.

4 CASE STUDY INTERVIEW GUIDELINE

Country: _____

Region (NUTS 3 or below): _____

Interviewee (name and institution): _____

Interviewer: _____

(short reports of interviews should be prepared for internal use; max. length about 3 pages)

Part I: Regional context and the overview of land use and land use change

1. Introductory question:

How do you perceive the location of the Case Study, in terms of location, accessibility, territorial specificity, remoteness; economic performance, natural resources, agricultural productivity, institutional setting and policy support?

2. Specific context information

Are there specific geographical features of the CS relevant for continuing/abandoning land management?

Which are the main influencing aspects for land abandonment in the CS?

What are the particular challenges of land abandonment and expected effects?

3. Please provide a brief overview of the **situation of land abandonment** in the CS

For how long have effects of land abandonment been visible in the CS?

What specific regional factors have favoured/reduced trends for land abandonment (in the past, currently, and in future)?

Part II: Discussion of drivers and effects

4. Analysis of land abandonment drivers and effects

Which are the main drivers for land abandonment in the CS?

- agricultural productivity (weak potential, ANC situation)
- land use system / agricultural structures
- location factors
- accessibility of public services
- regional economy performance
- policy support (CAP, ESI funds, environmental policies, other relevant policies)

What are the main effects of land use development in CS?

(social, economic, environmental, with particular emphasis on environmental effects), considering both positive and negative or mixed effects.

Part III: Adapting policy frameworks and appropriate measures

5. Mitigating measures

What policy measures are/would be particularly effective?

CAP (ANC, AECM, “territorial dimension” measures, like LEADER/CLLD, cooperation, etc.); EIP-programmes

ESI funds (EFRE and ESF programmes; INTERREG)

Green Deal, Just Transition Fund (JTF)

In what direction would effects of measures go (positive/negative; mixed)? And how to secure policy reforms towards more beneficial measures (mitigating land abandonment)?

6. Conclusions and recommendations

Do you have any specific policy recommendations (or general socio-economic development recommendations) to tackle land abandonment issues in the CS?

What is the role of national, EU level in dealing with land abandonment challenges?

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This study examines the phenomenon of land abandonment, its consequences and mitigation. Using quantitative data, the possible future development of land abandonment, its historical evolution and state of play are outlined. Desk research and case studies are used to determine the drivers of the phenomenon, its effects and mitigation options among European policies, particularly the CAP. Three scenarios of future land use change are developed based on the findings of an internal workshop to help formulate conclusions and policy recommendations.
