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MAP Position Paper

LAND USE & CLIMATE CHANGE

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Find out more about the Climate-Friendly VillageMulti-Actor Platform in Czechia!
https://rural-interfaces.eu/maps/czechia-climate-friendly-village/

Summary and key messages

In a democratic society, change is often brought by public pressure, backed by research findings that highlight the need for change, and politicians can then facilitate change. It depends on the maturity of the society what changes it requires. Whether it is interested in longer-term goals and a healthy planet, or more in short-term profit with little regard for environmental impacts.

At first glance, Czech society's attitude to the environment and climate change might seem contradictory. Czechs are nature lovers and are often described as the 'kings' of waste sorting. On the other hand, few Czechs feel personally responsible for tackling climate change. However, addressing climate change is a prerequisite for maintaining the Czech landscape (from the Czech Climate 2021 project).

Most people in society would like to have beautiful nature and a clean environment, but there is also a low willingness to do something about it. In 2022, we took a closer look at two of the ten points defined for a climate-friendly community (see annex 2). The Multi-Actor Platform (MAP) members chose these two activities: comprehensive land improvement and AFS, because these two approaches can most effectively systematically transform the landscape to be more resilient to climate change and excessive land and water degradation in the landscape. Both measures fall mainly under CAP support. Comprehensive land improvement - is a long-term legislative process (8-15 years) that needs to be initiated and can result in transforming the landscape structures of an entire cadastre. In contrast, AFS can be applied within one year on existing crops. But, invariably the results - new landscape structures and tree cover - are not functional for 10 or more years. Both approaches, however, require educated people on the subject and positive public opinion.

The Czech landscape is diverse from lowlands to mountain areas, 33% of the Czech Republic is covered by forests and the country is the watershed of Europe. In the Czech Republic, nature protection is underpinned by the designation of 12 565 km2 of valuable natural environment. Of these, 1,191 km2 are national parks (the highest form of nature protection) and 11,374 km2 are protected areas (high form of protection). The area is not final and new areas or small areas with prescribed protective management are still being created. Other protected areas are for water protection. On the other hand, the protection of other landscapes appears to be weak. Here, climatically inappropriate approaches are created or maintained - large monolithic areas of agricultural land, massive housing developments without appropriate blue-green infrastructure (housing estates, motorways, warehouses, hypermarkets). Soil sealing is a major problem in the Czech Republic. We have been losing about 14 ha every day for decades (VÚMOP).

Monocultures of agricultural land (62% of the territory of the Czech Republic) appear to be a **major problem, creating heat islands** similar to cities, but over a much larger area, where the soil loses its natural biological and biochemical properties and is no longer able to perform its natural functions, including water retention in the landscape. There is a need to change public perception in terms of reducing the notion of meeting unlimited needs and increasing sensitivity to landscape management - especially covering the land with suitable vegetation and limiting land take. The Czech Republic must not become a cultural steppe and a transhipment point for Europe, because this will deprive Central Europe of water.

Land consolidation has a long tradition in the Czech Republic dating back to the Austro-Hungarian Empire. This fact can to some extent act as a facilitator of the adoption of land regulation even today. After accession to the European Union, land consolidation was included in CAP support and is also partly co-financed from national sources.

Land consolidations and AFS are two tools with the potential to increase landscape resilience. Land consolidations is key for land restoration after socialistic system of land use. AFS as an ancient, sustainable form of landscape maintenance that combines the best of agriculture and forestry, and which is remarkable for the many benefits it brings to the natural environment and to farmers. Although common in the past, very little of the country's farmland is currently devoted to AFS. The main reason for this change was the

transition to large-scale farming during the socialist era, and this method of large-scale farming using large blocks of land persists to this day.

Therefore, the theme of MAP CFV focused on finding the causes and possibilities of changes at the level of municipalities, regions and states in landscape management in the Czech Republic, which can also serve as inspiration for other countries.

1. Introduction

1.1. Introduction to Land consolidation

Land consolidation (LC) especially Complex land consolidation (CLC) is a tool for the spatial and functional arrangement of non-forest land in the cadastre of a municipality, which is divided and consolidated to ensure its accessibility and use for rational management of land owners and also to improve its economic, natural and landscape functions. The result translates into an improved quality of life in rural regions, contributes to maintaining sustainable development of the territory, improving the environment and promoting a sustainable non-forest economy. They contribute to addressing the negative impacts of climate change, particularly in terms of the adverse effects of floods and droughts and dealing with water infiltration and runoff in the landscape. They also define natural areas - elements of territorial system of ecological stability (bio corridors and biocentres, interaction elements). They help to implement spatial planning plans and enable the use of financial support from EU funds. In terms of scale, two types of land improvements can be distinguished, complex on the entire cadastral territory and simple on a smaller scale for the implementation of local anti-erosion or anti-flood measures.

Needs addressed by the CLC:

- Rearrange parcels in the cadastral area in a new and more efficient way, mostly merging historical ownership divisions. At the same time, to remove legal defects caused by land reforms during the socialist era.
- Address the negative layout of land in the landscape and reduce the impacts of climate change (drought, overheating, flooding, extreme weather events, land degradation).
- Improve the overall environment, ensuring protection of the soil stock, increasing the ecological stability of the landscape and providing accessibility to enable rural development and regeneration.

The specific objectives of the CLC for landscape creation are the so-called "Common measures"- restoration of field paths with linear greenery, implementation of nature-friendly flood protection and anti-erosion measures, restoration of other elements of the blue-green infrastructure (woods, small water areas, retention basins), etc. The process, which is carried out by an expert firm under the direction of the State Land Office (SPU), involves the local municipality, which appoints a group to discuss the changes together with other entities - neighbouring municipalities, micro-regions, LAGs and other local initiatives. Collaboration facilitates the negotiation of the change process. A major added value of the CLC process is the new land registry mapping and free land surveying to landowners and the possibility to amend lease and tenancy agreements for landscape management.

The legislation in the Czech Republic is sufficient only the implementing regulations and the conditions for starting LC are restrictive. Act No. 284/1991 Coll., on land adjustments and land authorities, which was replaced by the currently valid Act No. 139/2002 Coll., on land adjustments and land authorities, as amended, to which Decree No. 13/2014 Coll., on the procedure for land adjustments and the details of the land adjustment proposal, was issued by the Ministry of Agriculture. However, since 1991, when KPU and JPU were legislatively approved, **only 25% of cadastres, where 38% of the agricultural land of the Czech Republic is managed,** have been approved and gradually implemented (SLO 2021), see Chapter

3. This means that the process for the whole territory would need about 70 more years at the current pace! This shows a very slow legislation based on the premise that the consent of the owners of 50% of non-forest agricultural land must be obtained. The institute of induced KPUs in terms of high landscape threat is not yet applied. The SLO headquarters argues for the small staff capacity of the offices to implement more KPUs than150 cadastres per year and political instability, where the number of staff and the budget for offices and implementation are alternately limited. The Czech Republic has over 12,000 cadastres suitable for implementation, see Chapter 3 for the status as of 2021. There are also a limited number of companies in the Czech Republic that deal with LCs, as their implementation is specific, professional and long-term. Tenders are often conditioned by the lowest price and not on the quality elements of the outputs. Due to the instability of funding and the complexity of the process, there is also a significant shortage of specialists and designers who are essential to projects of LC.

Land consolidation creates conditions for the rational management of landowners, but it also benefits other persons (water management, transport, farmers, nature conservation). They are financed and managed by the state. Its participation in the implementation and approval process is necessary, as is cooperation with the municipality of the cadastre. The results of the land management also serve to renew the cadastral register and are a binding basis for spatial planning.

1.2. Introduction to agroforestry

Agroforestry – AFS (especially silvopastoral systems), where there is a strip combination of soil blocks for crops and split tree strips. Trees can be grown for timber (harvested for a minimum of 25 years) and also fruit trees with other agricultural production of fruit. Tree planting in an area with livestock grazing increases the food supply for grazing sheep, goats, cows or poultry. Please note, however, that keeping pigs in the forest, as in Spain, is illegal in the Czech Republic.

The benefits of AFS include soil conservation, increased biodiversity, diversification of production and possibly animal welfare. AFS can be considered a long-term investment, as the income comes after a certain period of time. As it is a labour-intensive system and takes a long time to develop, it increases rural employment rates and overall economic prospects, promotes intergenerational farming and a positive relationship between people and their environment. AFS often improves the appearance of rural landscapes and its positive impact on local biodiversity goes hand in hand with supporting pollinators and providing suitable habitat for pest predators. Trees can act as a green corridor and their presence improves the soil and reduces erosion and overheating. Not only that, but trees also mitigate wind events, sequester carbon in their bodies, and harmonise the local climate.

Despite all this, there are some disadvantages of AFS, such as the long wait for a return on investment or the high demand for labour. Trees can compete with other crops in their close proximity for water and sunlight and therefore have a negative effect on crops and some tree species are unsuitable for the crop being grown e.g. the non-native Acacia thorn tree has an allelopathic effect on crops and the barberry is an intermediate host for grass rust (puccinia graminis).

The history of AFS can be traced in this country, as elsewhere in Europe, from the Middle Ages - when strips of fruit trees between fields or pastoral orchards were maintained in most areas, which were maintained as communal pastures until about 1950, when the communist regime ploughed most of them into fields or converted them into intensive meadows without trees.

Picture 1 municipality Radějov in 1950 and 2022 without land consolidation and agroforestry.

Why it is difficult to renew or re-establish AFS today was determined by a survey among farmers (Lojka and co.2020).On the farmers' side, the barriers are more in the implementation of AFS interventions. Building an AFS is time consuming and requires considerable effort, but it takes many years to recoup these investments. Land ownership is a major barrier, as many farmers farm on rented land and short-term contracts. Owners often do not agree to plant trees. This is something that land consolidation can change.

AFS, which is more labour intensive, may suffer from labour shortages. Questionnaires conducted as part of the survey showed that AFS requires a great deal of knowledge, but there is a lack of training, information and literature on AFS methods and practices. **Additional services are almost non-existent**. AFS is often perceived by the farming community as incompatible with modern agriculture or the local climate due to poor education. Farmers fear that trees will reduce the amount of usable land or that they will not be able to maintain the AFS.

There is a contradiction between the views of farmers and environmentalists. Farmers and producers are primarily focused on income and their concern for the ecological impacts of AFS or trees is limited, especially in terms of carbon sequestration or water balance. Yet most farmers value the soil conservation and local biodiversity that trees provide and are concerned about managing in this way. There are several reasons for this, for example that farmers working on rented land (about 75% of farmland is rented) are understandably reluctant to establish AFS. Only 24% of farmers with rented land would be willing to start AFS. While 64% of farmers with their own land would consider AFS. The highest tendencies of AFS are among organic farmers and relatively small farmers (Lojka et al, 2021).

Fruit production and improved animal welfare are recognised as natural pest control and the aesthetic quality of the agroforestry landscape. (Lojka et al, 2021) Farmers liked the idea of keeping poultry or cows among trees, but the prospect of pigs is not yet possible because legislation does not allow it (see note above). Fortunately, there has been a slight improvement in access to information in recent years, but there is still a lack of research on AFS. The Society for AFS at CZU has published its first methodology (CZU 2020). A decree is currently being prepared according to EU legislation that will allow planting trees and shrubs on agricultural land in AFS. Besides, a subsidy title for the creation and maintenance of AFS under CAP CR 2021+ is approved, but it is with a very low spatial subsidy and only **1200 ha of AFS by 2027 for all Czech republic.**

3. Current situation based on background research and evidence

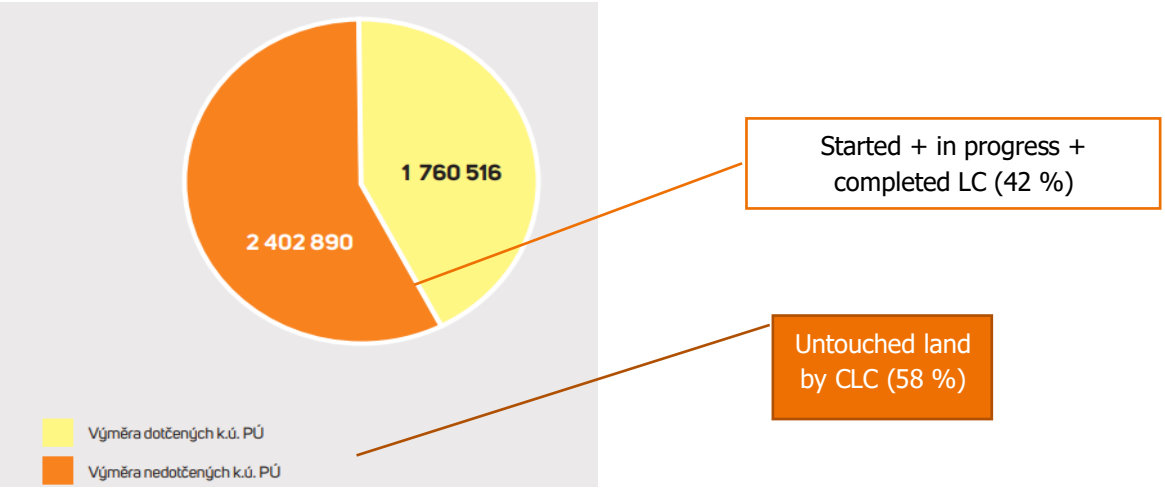
Land consolidation

In 2015, the Strategy of the Ministry of Agriculture of the Czech Republic with a view to 2030 was created, which brings together a set of measures. This also affects agricultural landscapes and land authorities, which are the guarantor and managing body for land improvements. This strategy states that the extent of damage caused by erosion has been estimated for the initial state (2016) at CZK 4-10 billion/year. The target range of damage for 2020 has been proposed as 3-8 billion CZK. The State Land Office (SLO) is working closely with the Research Institute of Land Reclamation and Protection (RILP) to put the 2030 strategy into practice. Without cooperation with planners, surveyors, mayors, owners, municipalities and to a large extent the LAG, implementation is impossible.

There are 13 076 cadastral areas (cadastral districts) in the Czech Republic, of which 12 080 cadastral districts are classified for solution at the Land Office (mountain areas and large cities are excluded from the solution). As of 7 April 2022, 4,326 land areas are affected by land adjustment (started and completed). In addition, there are still 3 273 small-scale land improvement projects.

To give a better overview, this means that currently, complex and simple land consolidation has been carried out on 38.4% of the agricultural land area, with land consolidation currently under way on another 12.5% of this land. For some cadastral units (municipalities), the implementation of land improvements is a direct condition for their further development. However, due to the time and investment intensity of the land adjustment process, the process still does not meet the needs of municipalities, owners, land users and the state administration authorities involved. The situation is complicated in particular by the fact that during the privatisation of state land, in some cadastral areas sufficient reserve of state land was not left for the implementation of common facilities.

Picture 2 Acreage of agricultural land where CLCs have been started, are in progress or have been completed.



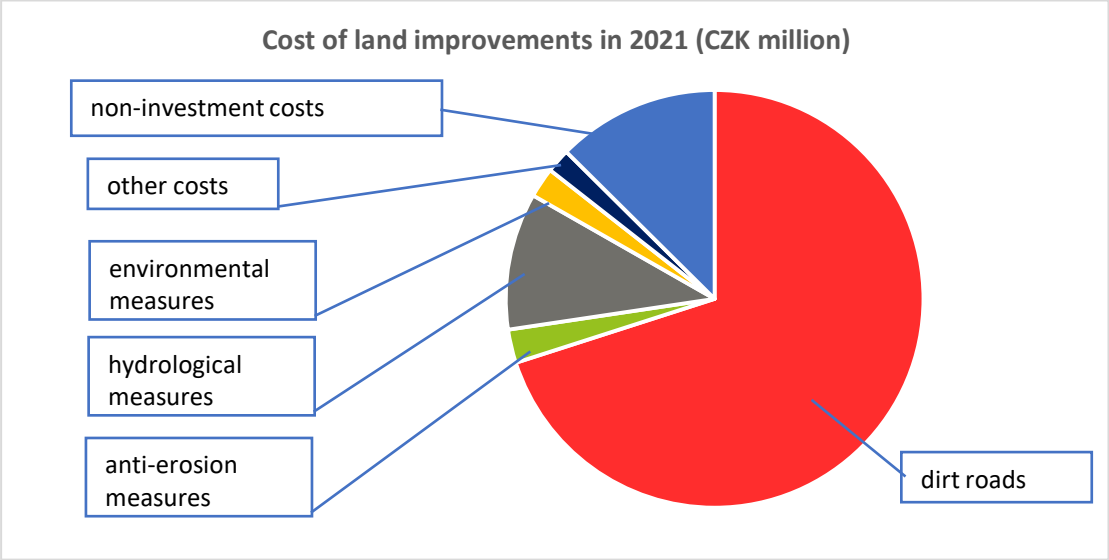
Source: koncepce PU 2021–2025

The data in the graph are expressed in agricultural land area.

LCs are covered both by the state budget (General Treasury Administration, Budget of the State Land Office and the Road and Motorway Directorate) and by funding from EU funds (RDP 2014-2020 and Operational Programme Environment). Funds from the state budget are earmarked for the preparation of LC proposals as well as for the implementation of common facilities within the approved LC proposals (dirt roads, anti-erosion, water management and ecological measures). The EU funds mainly finance the implementation part

of the land improvement process. The total amount of funding for LC support in 2021 reached CZK 3 billion (EUR 115 million), of which more than CZK 2.6 billion (EUR 100 million) was used for the implementation of common facilities. In 2021, approximately 87% of the funding was used to implement elements of the common facilities plans and 13% was used for non-investment activities, primarily land development proposals and land delineation following land consolidation. The total cost of the activities of the land authorities since their launch in 1991, including the cost of complex and simple land consolidations, reached 38.7 billion CZK (1,488 million euro) by 2021.

Picture 3 Cost of land improvements in 2021 (CZK million) according type of investment in 2021



The chart of types of land improvement costs shows that **dirt (mostly asphalt) roads predominate**. Anti-erosion measures and biodiversity protection measures - ecological measures - remain poorly implemented.

Innovative LC practices and targeting are planned in order to adapt the landscape to the climate conditions projected for 2050+. LCs still contribute significantly to changes in the spatial-functional relationships of the landscape. In particular, the aim is to better cope with climatic and hydrological extremes such as drought and floods, while avoiding accelerated soil erosion and water quality degradation in agricultural catchments.

The direction of land management in 2030 is to develop a maximum of 150 PUs per year, which will strengthen the implementation of the proposed measures in the landscape.

The estimated volume of financial resources for the implementation of LC in the Czech Republic over a ten-year period is expected to be in the range of 1,500 LCs, which represents a total of EUR 6,000 million. CZK (231 million euro) of funding for non-investment activities and 20 000 million CZK (231 million euro) for investment activities. CZK (EUR 769 million) for planned investments for implementation. The SPÚ made this calculation of needs at a time before the increase in inflation. It is therefore likely that fewer activities (projects and implementations) will be carried out for the same amount of financing.

The use of funds for non-investment (planning) activities and the implementation of proposed measures in the landscape is not and has not been a problem in the past. As of 31.12.2021, 97.4% of the allocated RDP 2014-2020 funds have already been used. Other projects are committed. The evaluator of RDP 2014-2020 (Naviga 4 s.r.o.) states: the LC financed from RDP contribute to the improvement of the landscape condition and environmental protection, however, to a less than expected extent, while the evaluator considers the set target values mainly for ecological, anti-erosion and thus overall area measures to be the expected level. This can be seen in Table 2.

Table 1 Implementation of RDP 2014-2020 indicators in the land improvement measure

Additional outcome indicators	Value in 31.12.2021	Target value	% rate of achievement
94301 Total length of roads (providing access to land, increasing permeability and diversification of the landscape)	462	768	60,1
94100 Total area of implemented area measures	332	660	50,4
94103 Total area of implemented ecological measures	106	247	42,9
94102 Total area of implemented water management measures	135	49	275,4
94101 Total area of implemented anti-erosion measures	92	364	25,1

The reality shows that we are more successful in preparing the project and less successful in implementing the measures. This reshaping of the landscape requires close cooperation and involvement of municipalities and other local initiatives. Under the law, the plan for common facilities is approved by the municipal council and the land designated for the location of common facilities is usually transferred to the municipalities. Upon completion of implementation, the constructed measures are also transferred to the municipality, which in effect means that the funds invested in the implementation of LC measures become the property of the municipality in their final value.

Agroforestry systems

AFS in the Czech Republic have their tradition in pastoral orchards, field orchards, mesas and other elements of small-scale farming until 1950, and covered over 30% of agricultural land. Today, AFS in the Czech Republic cover only about 1% of cultivated agricultural land, much less than the European average of 8%. The most common forms of AFS in the Czech Republic are silvopastoral orchards, silvopastoral tree plantations on farmland boundaries and remnants of small-scale agriculture around settlements and in gardens. Most AFS plots are located in the peripheral and foothill areas in Central Bohemia and the White Carpathians.

The development of AFS in the Czech Republic is complicated by various obstacles, the most pressing of which are legislative ones. There is no clear legal definition of AFS, but rules for the CAP subsidy title are being prepared already under the RDP. The subsidy title should come into force from 2023. There are proposals for a definition of the CAP (including density of trees per ha, definition of agricultural land cover, etc.). There are also a number of comments from the CSAL (Czech Society for AFS), such as **the limitation of the number of trees per ha, the area of a land block covered by woody vegetation** is considered ineligible for subsidies or reclassified as a "landscape feature", etc.

At present 7/2022 is approved version of the regulation - future decree which provides for planting in a certain zone of max 100 trees per 1 ha of which must be at least 50% forest trees, species for planting are listed. According of this version foresees CAP subsidies for only 1200 ha in the CR by 2027.

The challenge for MAP CFV and its continued activity will be in the area of:

- Develop a call from the MAP CFV discussions to implement activities for change with a list of essential steps.
- Develop a proposal for LAGs on how to animate activities in rural areas that will help to implement diverse landscapes and also include research and policies in the landscape change process. (e.g. MoE, Land Offices, universities, regional authorities, and selected grant agencies).

- For CLC reshaping the landscape requires close collaboration and involvement of communities and other local initiatives. According to the law, the plan of common facilities is approved by the municipal council and the land designated for the location of common facilities is usually transferred to the ownership of the municipalities, unfortunately, so far it is mostly asphalt roads.

4. Position of the Multi-Actor Platform

The following interventions appear to be key to improving the CLC implementation process based on discussions with representatives at local, regional and state levels:

- Filing an application for a CLC - no possibility to file an application due to the endangerment of the territory, necessary to legislate and especially politically enforce better conditions; in the procedure of filing due to consent in the territory **- obtaining the consent of the owners 50% of land** - is usually hindered by a large owner or a large agricultural enterprise that influences the owners.
- Financing of the CLC design process is possible under the CAP, but there is not enough financial subsidy per 1 ha of land and the implementation then slides towards quick and inferior projects without sufficient environmental protection and implementation ecological services in landscape.
- The implementation period of the CLC project is very long, despite three electoral terms of municipal council in the village and interests and objectives change and the process often frustrates supporters and lacks follow-up implementation.
- The actual implementation of the CLC, which is financed through the MoE (enviro) and the State Land Office (technical) does not have enough financial resources and municipalities usually enforce mostly for technical measures such as roads (72% of the funds for the implementation of the LC project), according to the SLO statistics, see chapter 3).

However, there is a lot left to improve the implementation of **AFS**, which will be newly supported in CAP 21+. In practice, more flexibility and simplification of payment is required, and the MoA is rather inclined towards a moderate roll-out of only selected AFS to a maximum of 1200 ha.

Projects needed to improve the situation:

- Transparently describe the development of the situation and name the problems that hinder the development or maintenance of diverse landscapes in the Czech Republic.
- Monitoring the impacts of implemented measures within CLC and AFS in terms of societal benefits, benefits for climate change, attempt to quantify the benefits of both measures.
- For AFS, there is a low level of transfer of research to practice, to deepen knowledge of the interrelationships of field crops and tree species and new microclimate conditions.

4.1 Identified needs

What are the needs of the area covered by the MAP in relation to (topic)?

There are 3 key things needed to implement CLC:

- Adjust the objectives of the CLC.
- Create more flexible legislation and financial subsidies.
- Increase the interest of large farm owners and municipalities as the main actors – landowners/land users.

Objectives of Complex Land Consolidation

- The fundamental conceptual foundations of the land improvement process remain roughly the same in the long term but are now more oriented towards the possibilities of landscape adaptation in the context of changing climatic conditions. Therefore, in January 2019, new principles of land management were introduced, which focus on the long-term retention (accumulation) of water in the landscape. **All measures within the framework of land management will be sized for climate conditions after 2050.**
- Compared to the current priority of water retention in the landscape (short-term water retention), measures related to water storage in the landscape (long-term water retention) will be strengthened.
- Another part of the CLC will be the creation and respect of links between several adjacent cadastral areas. It will then be possible to implement CLC in several adjacent cadastral areas at the same time.
- Measures for the construction of common facilities will be multifunctional, for example, polders will be used for water retention and storage.
- Priority will be given to the cadastral areas most at risk of drought and erosion when launching CLC.

Objective of Agroforestry:

- Improve legislation for implementation in the Czech Republic
- Extend area and financial subsidies
- Increase the interest of farmers as main actors.

4.2 Existing interventions and actions

What are the policy interventions already in place and what are examples of actions taken by local actors addressing these needs implemented on the area covered by the MAP?

CLC celebrated its 30th anniversary of implementation in 2021 and has a number of exemplary measures in many cadastres which are presented at conferences and seminars. However, there are very few representatives at these meetings from municipalities where CLC has not been implemented. Several publications on CLC measures have been produced, as well as a website. The municipalities after the implementation of the CLC are often significant in further development and are awarded in other competitions, e.g. in the competition https://www.vesniceroku.cz/ (municipality of the year).

In 2019 SLO in cooperation with the MoA and the Czech University of Agriculture introduced new principles of land management in conditions of landscape adaptation to climate change. It also includes an award ceremony for the best projects, see video here.

Picture 4 Measures from LC, Bitov water reservoir

Agroforestry systems are being restored in the spirit of the traction and again mainly thanks to small farmers, mainly associated with the Association of Private Farmers (ASZ). Many of them have been awarded in the new Varied Landscapes competition. https://www.asz.cz/o-asz/nase-aktivity/pestra-krajina/

Picture 5 From website ASZ competition Pestrá Krajina 2021

In the KLIMAGREEN project organised by the South Moravian Region, the LAGs Network and other organisations and in cooperation with the authorities of Lower Austria, a number of activities and a subsidy title have been launched, but so far only for public entities - mainly municipalities. The project focuses on planting fruit trees, which have almost disappeared from the Czech landscape in recent years. The landscape is planted mainly with fruit trees, such as pears, cherries, apple trees or not so familiar to the common man domesticated fruit species.

The network of LAGs of the Czech Republic received an allocation of CZK 1 billion for the animation of projects for planting in the landscape, 30% of the LAGs were involved even without the right to a donor in 2018 - 2020. They prepared and subsequently animated in the complex subsidy environment of the OPŽP a total of 205 projects for planting more than 50,000 trees for almost CZK 200 million, thus also creating elements of green infrastructure with AFS functions on about 250 ha in 130 municipalities in Bohemia and Moravia. It was not possible to apply more funds because the necessary areas of agricultural land cannot yet be planted with trees. Therefore, talk was developed to create ALS, where LAGs would perform animation in the territory. A manual for Planting fruit trees in the landscape was created viz www.milionstromu.cz

Table 2 – Examples of actions taken by local actors

Title Land Consolidation

Clear information about the development and projects of LCscan be obtained on the website of the State Land Office (SPÚ), https://www.spucr.cz/pozemkove-upravy

Important organisations: most of the technical, agricultural and ecological universities are involved in LC, from research institutes it is mainly VUMOP, then there are ro organisations and associations, ASZ, Agrarian Chamber of the Czech Republic, NN LAGs (enviro Ing. Marek Hartych), individual LAGs and many others.

Title Agroforestry

Farma Miller Holubice, Crop production, such as cereals, rape, sugar beet and fodder crops, and cattle breeding with milk production, 880 ha,

Challenges, recommendations: the biggest threat is drought, there is also a risk of herbicide drift from crop production next door, recommends quality establishment methodologies and teaching programmes.

Forest – Agro spol.s r.o., agricultural production and forestry, 927 ha

Challenges, recommendations: the problem of planting trees in areas with drought, protection against wild animals and rodents is necessary, they have broken with the legislation by converting part of the land in LPIS to boundaries, It is advisable to adapt the planting technology to the area, not to plant everything at once and to count on losses.

Farma Michalisko Mladecko, trees on arable land, silvopastoral, crop production, orchards, breeding of fallow deer, sheep, goats and cattle, 39 ha.

Challenges, recommendations: The biggest problem is currently the setting of the Czech subsidy policy and the overall agricultural legislation which does not support agroforestry systems. Another big problem is the wildlife that destroys planted trees - protection is needed.

Farma Marada – 70 ha Šardice , fruit belts in arable land, meadows with trees, South Moravian Region

Challenges, recommendations: they see the problem in the setting of the current Czech subsidy policy and overall agricultural legislation, which does not support agroforestry systems. In Praxis, it is faced with wild animals that cause crop damage and increase fencing costs. It does not yet know the economic benefits of fruit trees.

Výuková farma Žabčice (Mendelu), trees on arable land, experimental area on a farm of 2 533 ha (cooperation with VÚKOZ). It is a research on agroforestry plot with comprehensive monitoring of tree-crop-soil-atmosphere system relationships

Challenges, recommendations: the most serious problem in planting is climatic and soil conditions - it is necessary to know them well and to combine them with suitable tree species.

Pokusná stanice Michlovka, transformation of alley trees to agroforestry system, ALS and control with conventional field were equipped with monitoring system to monitor climatic, soil and hydrological parameters, 23 ha

Challenges, recommendations: problems with damage to tree root systems when using tillage technology, lower crop yields near trees.

Farma Františka Bartoše, plantation of willows and poplars and poultry and vegetables, 150 ha.

Challenges, recommendations: problems with wild beasts (fox, marten) fencing and trapping necessary.

Jelen z Misek, silvopastoral and multifunctional, 3.5 ha.

Challenges, recommendations: the biggest problem is the gnawing of the above-ground part by animals, the gnawing of the roots by rodents and drought. Recommended protection of trees with netting, fertilisation with organic matter and irrigation.

Farma Daniela Pitka, silvopastoral and ecological areas, sheep and cattle breeding and fruit trees, 600 ha,

Challenges, recommendations: like everyone else, cites drought as the biggest problem, destruction of trees by wild animals and rodents, recommends wooden fencing as protection.

Important organisations:

Czech Society for Agroforestry - at the Czech University of Agriculture,

Working Group on Agroforestry at the Ministry of Agriculture¨

Research:

TAČR research project ÉTA - Agroforestry - a chance for regional development and sustainability of rural landscapes, the TAČR research project epsilon ALS for the protection and restoration of landscape functions threatened by the impacts of climate change and human activities, Agrofosy - education

Association of Private Agriculture - promotion of agroforestry in the Czech landscape. The research takes place in

ČZU Praha Suchdol, Mendel University in Brno and Silva Tarouci Research Institute for Landscape and Ornamental Horticulture

4.3. Recommendations from the MAP

4.3.1. Recommendations for future rural policies

Which policy interventions (i.e. instruments, measures) are recommended by MAP members to be implemented at the local, regional, and/or national level? How can the EU support these interventions?

The identified MAP needs could be summarised in the following areas:

a) Education, awareness raising and the possibility to consult with specialists on the development of CLC and AFS, which could exist e.g. through NN LAGs. Individual LAGs can contribute to improving communication between stakeholders. Direct involvement of LAGs as animators in the process of CLC and AFS implementation can both facilitate and accelerate the process.

b) In areas of higher environmental risk (to be defined), speed up the CLC process by reducing the number of landowner consents.

c) Double the number of CLC projects addressed from 150 to 300 c.u. implement proposal of CLC measures and thus also increase the budget significantly.

d) Remove legislative barriers, help with legal issues of agroforestry - possibility of planting trees on arable land.

e) Eliminate the rather technical problem with terminology, where there is an ambiguous and non-unified terminology for CAP, OPIE, NPIE subsidy instruments. This makes it difficult to navigate the issue.

f) Greater legislative support and protection of agroforestry, especially modern agroforestry practices (alley cropping). The support should also include education (meetings, discussions) and promotion of agroforestry, e.g. in the form of advertisements, brochures or thematic social media accounts. Given the positive relationship discovered by Lojka between land ownership and willingness to establish agroforestry, we suggest more emphasis on "land banks" and better access to land ownership.

g) A serious weakness is the loss of experts (water management engineers, landscape experts), but these specialists are getting older and are not being replaced by young ones. One of the reasons is their low financial valuation.

h) Focus more on soft measures in the area, which are only recommended in the LC project and are the responsibility of the farmers, but not possible controlled in LPIS system. These are for example conservation agro technologies, strip crop rotation, ridge tillage, etc.). Here the support of the MoA and the EU is important. Recommendations for future research agendas.

4.3.2. Recommendations for future research agendas

- Greater emphasis on research and the acquisition of comprehensive data on the IMPORTANCE of agroforestry in the Czech Republic - and their transfer into practice.
- Supporting projects are, for example, We Bet the Future, where CLC projects have made the most significant impact in planting possibility in cadastres. The ¨SLOs and municipal offices are the most important implementers of plantings, both linear elements, avenues, solitaires, or bio corridors, which they place professionally in the landscape. The expert guarantee is provided by AOPK or the Protected Landscape Area.
- Increased support for research on AFS and its development in the Czech Republic.

Conclusions

The CLC process needs to speed up the process, so the following conditions are important:

- Stable SLO offices, significant fluctuations in funding (redundancy or recruiting) is detrimental to the quality of the work. Certainty for implementing companies (designers and landscape contractors) depends on this.
- The bureaucratic complexity of the process CLC projecting (especially for the process of dealing with owners) is increasing, slowing it down and discouraging the implementation of landscape measures
- Good cooperation with the municipality is the basis for the success of land improvement. If the educated representatives of the municipality cooperate with designer, the designer can incorporate measures to mitigate the impacts of climate change (water in the landscape, reduction of soil degradation processes, C sequestration).
- The technical work of CLC projects has been completed, but the realisation of the projects in terms of climate protection efficiency has not be done. The cause is often the lack of state land for landscape measures. The uncontrolled massive sale of state land, unfortunately supported by state officials, took off especially in the 1990s. This land was bought mainly by wealthy citizens who have no relationship to land for sustainable agricultural business, but rather for speculative purposes.

For a climate friendly community (CFV) - it is important to support these actions, which often the community itself cannot handle and cannot be action capable - action resilient in the context of climate change:

- Develop education on CLC and AFS and animate municipalities to create them - preferably through LAGs.
- More negotiate legislation - link the land use plan with the implementation of the CLC after the approval of common measures all new landscape elements in new, not arable parcels to be grassed at least.
- More negotiate legislation - focus on soft measures in the area that can/should be done by the farmer and be possible checked in LPIS.
- During planning and implementation of CLC, comprehensively address water retention in the landscape - water reservoirs as well as soakage ponds and plantings.
- Promote AFS inter alia as a tool for land protection (LPF) in climate change and create better subsidy opportunities not only for farmers but also for other landowners (municipalities, associations).
- More educational events on AFS for a wide range of participants and expand research on the impacts of AFS on farming and ecosystem.
- Promote AFS demonstration farms and motivate citizens to adopt sustainable lifestyles.

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Annex 1 Methodology used by the MAP

Responsibility: Facilitator and Monitor

Which kind of stakeholders/how many participants/groups/facilitators?

During the interviews, 52 from the professional community, concerned organisations, relevant administration and educated farmers were interviewed. For CFVs - climate resilient municipalities - it is important to find methods to uncover problems and their causes so that municipalities can see solutions. The selection of interviewees is important; if we reach a shortlist of respondents who have a longer-term overview and interest in the topic, we can obtain most of the relevant information.

For the thematic questionnaire method (used as a basis for the interview), the study by Lojka et al. 2021 was used.

Was there any anticipation in preparation for the MAP meetings (e.g. questionnaires, documents shared)?

Yes, it existed, and it was implemented. It was a school on how to formulate topics, how to create structured interviews and how to share documents on the topic.

In the beginning, we spent quite a long time finding and refining consensus on what and how we would address in MAP.

Which changes did you implement to the process?

LAGs are very diverse in their focus. They reflect the professional and educational background of the office staff and the priority issues and needs of the regions. Some of the LAGs oriented towards environmental protection are interested in the implementation of complex land improvements, introduction of agroforestry crops or agro-FVEs. These expectations and needs have been implemented in the process.

The discussion of CLC and AFS topics is seen as important tools for rural development. The recruitment of new stakeholders within communities is important. Involving LAGs as new animators of these topics in the preparation and implementation of SCLLD.

What was difficult for facilitators/criticised by members?

Infiltration into the problem of CLC legislation and misunderstanding of the importance of the issues addressed by part of the professional public and politicians. Negotiations with the promoters of the legislation were difficult. Rejection of many large agricultural companies that have a major impact on the ecosystem functions of the landscape.

What was particularly useful/appreciated?

In terms of the implementation of the MAP, it has proved right to devote enough time and energy to clarifying exactly what we want to address in the MAP and how. What should be the scope and intent, who to approach and why, what documents to use for research.

Discuss quality working examples of CLC and AFS implementation at home and abroad.

What kind of reflections were facilitated (or not) by the methods used? Did the MAP address any controversial issues in the exercise?

It wasn't so much about controversy as it was about different perspectives on the subject. It was important to reconcile the different perspectives and agree on a common interest and purpose. This was well served by repeated meetings and the search for a consensus in the sense of the principles of social democracy - that is, the search for a consensus to which none of the participants would object.

What we might consider controversial (fear of losing ground, fear of losing influence, etc.) during the guided conversations was in the selection of respondents when we just wanted to get different views on the matter.

Ownership of results: is there any take-up of results by MAP members? Were there any follow-ups to the meetings? If yes, by what members (policy, research, CS) and what kind of follow up (media, publications, debate started at the gov level/fed into an existing debate, etc)

Rather, the views of the working groups were used to prepare CAP 21+. We want to continue to feed the views and insights into policy making, but this debate is still to come. We would like to use personal and professional contacts to reach out to senior politicians at the level of government and parliamentarians. It is important to make them aware of the facts, such as the length of the process of complex land development, which often takes 7 years or more from assignment to handover.

Key learning re. the methodology, if any?

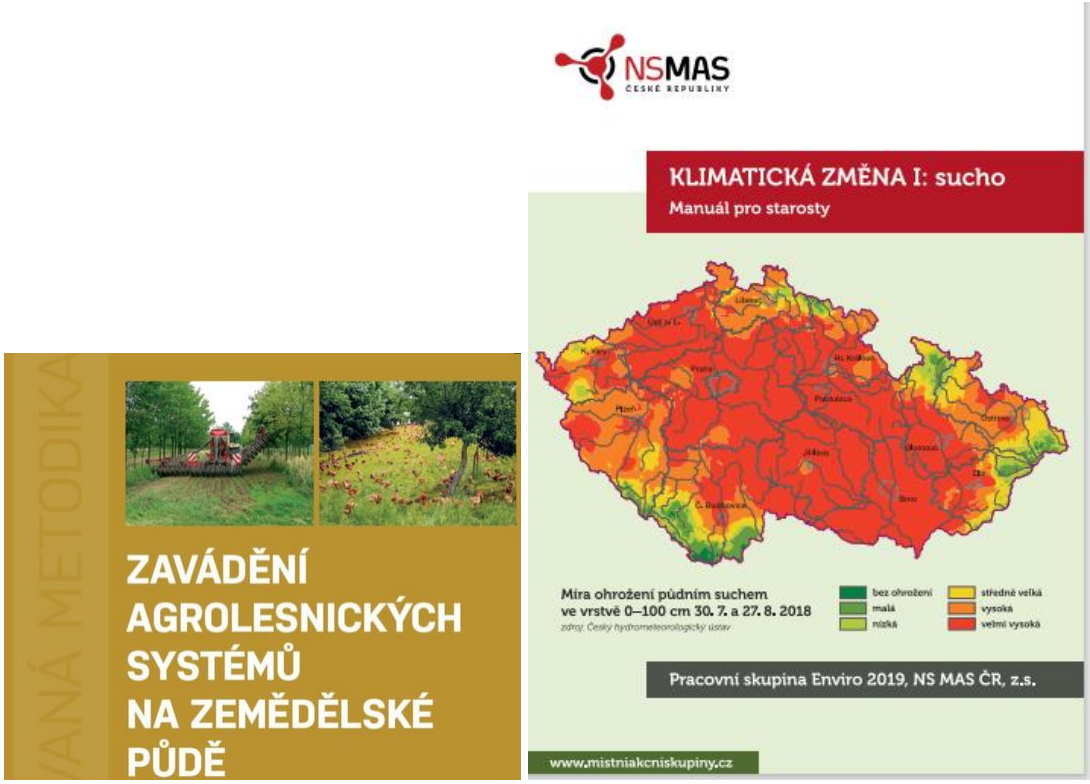
The results of thematic conferences were used (Rural 2018, 30 Years of Land Improvement, Leaderfest 2021). There are methodologies on both topics, on landscape protection, on Climate Change I (drought), a manual for mayors. The education side is also important, where it is possible to include a Methodology for increasing the capacity of local actors for sustainable development of the region, (Dlouha.J., et al)

It would be good to find out how these materials are used and how effective they are and which form of information has a higher and lower effect.

In the long term, it appears that face-to-face meetings and exchange of experiences are the most effective for disseminating good practice among mayors. Such direct confirmation and reassurance that something works, that it makes sense (whether financially or in terms of community benefit) is indispensable. Therefore, it is important to plan conferences and workshops as part of the dissemination of any results, which will allow informal meetings and discussions among the participants themselves, in addition to receiving information from the presenters. This in turn is a welcome feedback for the organisers or researchers.

It is also the experience of the SLO that CLCs started during the covid period without an initial meeting with all the owners have a much more difficult time in the clearance and approval of individual steps.

Picture 6 The mentioned AFS, A manual for Planting fruit trees in the landscape and Climate Change I (drought) methodologies for mayors



Annex 2

The members of the MAP CFV consider the following range of 10 headings important for the development of municipalities in the Czech Republic in the context of climate change and environmental sustainability:

1. The municipality makes sustainable use of the landscape and natural resources and implements mitigation and adaptation measures in accordance with the relevant development documents: development strategy and planning in terms of environmental sustainability;

2. Municipality and citizens use water resources safely and responsibly e.g. have a rainwater harvesting system;

3. The municipality retains water in the soil, in green areas and in water bodies in the landscape and in the municipality's intramural area by nature-friendly measures;

4. The municipality has developed land management plans and implemented landscape measures;

5. The municipality, in cooperation with the community, farmers and foresters, plants and maintains a varied landscape increasing biodiversity and ecosystem services: implementation of the territorial system of ecological stability, agroforestry, linear, group or solitary plantings, landscape orchards, flowering strips on arable land, etc;

6. The municipality implements waste management in accordance with the principles of circular economy and concludes win-win contracts with its contractors and suppliers;

7. The smart municipality supports the family and the community: quality information systems, citizen education on sustainability, volunteers help maintain public spaces;

8. Smart municipality works with other territorial partners and regional development actors, develops and supports short supply chains and local markets, community supported agriculture and social entrepreneurship;

9. The village has a functioning blue-green infrastructure accessible to all generations, the village and citizens benefit from ecosystem services, and schools are also involved;

10. The smart village uses modern management and technology, fulfils the principles of circular economy, monitors its ecological footprint, conserves resources and uses RES to the maximum extent possible, promotes sustainable mobility and operates a modern system of waste and wastewater sorting and recycling.

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