

Best Practice examples on natural carbon sinks in agriculture

Category: Model farm

Field: Heathy Soils, extensively managed grasslands



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Name	Fazakas Imre
Country	Romania
Biogeographical	Alpine region in the Eastern Carpathian Mountains, Csík basin
Region	and slopes of the Hargita mountains.
Region	Harghita county, Central region, Romania
Landscape/ Ecosystem	Mountain basin, 700+ m above sea level. Partly Natura 2000
type / protected area	area.
Size / Scope	50 hectares
Agricultural Use	Mixed organic farm: arable land, grasslands, cattle.
Involved	It is a small family farm, relying on the labour of family
Stakeholders/	members and one additional employee. They are members of a
Partners	small cooperative funded by 5 farmers from the village.
Duration	6 years min-till, 10 years organic, many generations farming
	family
Goals	The farm focuses on organic milk production on grasslands and
	self-produced fodder. They cultivate organic crops on their
	arable land, employing regenerative farming techniques. A key
	priority is to use nature-friendly methods and to enhance soil
	health. These techniques aim to increase humus content,
	improve water retention, strengthen soil structure, and biology
	as well as biodiversity. While carbon sequestration is a
	beneficial by-product, it is becoming an increasingly important
	consideration in their decision-making process.



	 They practice regenerative agriculture while fully adhering to the standards of certified organic production, employing the following methods: Min-till arable land cultivation Cover crops Organic manure Crop diversification Glyphosate-free approach Rotational grazing
How it works	 Water retention lakes and swales: On the grasslands, they have implemented water retention systems and actively plant trees to mitigate drought, enhance water management, and foster biodiversity.
	 Permaculture practices in vegetable gardening: they apply permaculture principles, such as planting trees and bushes, creating wet habitats, and following keyline design principles where the land structure allows.
	These integrated practices not only promote sustainability and ecological health but also support the farm's goal of enhancing biodiversity, improving soil health, and mitigating climate impacts.
Measures addressing carbon storage	Mostly all above measures contribute to storing more carbon in the soil through restoring soil health and soil biology. Additionally, the planting of trees and bushes leads to carbon storage in the above ground biomass.
Measures addressing biodiversity, and water	Healthier soil, crop diversification, no use of chemicals, water retention, tree planting contributes to improved biodiversity. Healthy soils, lakes and swales improve water retention and quality
Activities	Crop production on 5 hectares, rest of the land is used for feed production or grazing for the cattle (milk and meat)
Funding / Financing	CAP direct payments and organic scheme payments, but mainly own funding from the farm (eco-schemes will be effectively available from 2025 in Romania, he is planning to apply for the eco-scheme "environmentally beneficial practices in arable land")



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Transferability	Local farmers follow his example, both within and outside the cooperative they operate.
Further information	 They have no intention of expanding the business, as they are content with its current size. Their primary focus is on fostering a harmonious relationship with nature and identifying the most effective methods to preserve and restore their surrounding natural environment. They advocate for converting arable land into forestry or other natural landscapes, recognizing that conventional agriculture is no longer profitable in this region when using traditional methods.
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Description

Farm background

Imre Fazakas, a farmer from Madaras, has been involved in agriculture since 2000. In the early years, he followed conventional farming practices, including intensive animal husbandry, which relied on protein-rich feed containing GMO (genetically modified organism) soybeans. While the cows produced milk as expected, health problems began to surface within the herd, as the animals did not respond well to standard treatments.

Over time, Imre shifted his focus from quantitative production to considering the quality of food on his family's plate. Between 2008 and 2011, he transitioned from conventional to organic farming for both fodder crops and dairy production, earning organic certification. Imre introduced "Grauvieh" cattle, brought from Tyrol, Austria, known for their hardiness and ability to thrive in tough conditions. These medium-weight animals have low energy requirements and, in their native region, can withstand up to fifteen lactation periods. Imre believes animal husbandry and fodder crop production complement each other well. In fact, he views animal husbandry as essential to organic crop production, as organic fertilizer plays a key role in maintaining soil fertility.

However, over time, Imre realized that relying solely on ecological farming methods was insufficient. The landscape and climate had changed so dramatically during his lifetime that continuing traditional farming practices was no longer sustainable. Human activity, particularly in the Csík Basin where he farms, had significantly altered environmental conditions. In the past, the Olt River regularly flooded, creating wetlands that supported a rich and diverse ecosystem. But in the 1960s, the river was regulated to make way for collectivized and industrialized agriculture. As a result, the once fertile floodplains have become depleted, and the water level of the Olt River has significantly dropped. The land, now used for monocultures of grains like barley, wheat, triticale, and rye, has lost much of



its biodiversity. Previously, potato was a key crop, but its importance has diminished over the last two decades due to international competition.

Seeing these changes, Imre sought alternative solutions and discovered permaculture and regenerative agriculture. Both approaches take a more integrated and systemic view of farming, placing a strong emphasis on landscape and water management. In 2018 he began transitioning to regenerative agriculture while still maintaining his organic certification.

Out of his 25 hectares of arable land, Imre dedicates 5 hectares to growing cereals, such as spelt, for sale, while the remainder is used to produce alfalfa to feed his animals. He also manages 25 hectares of grasslands and pastures, where he keeps 25 dairy cows and 20 young cows. During the summer, the cows graze extensively on pasture, while in winter, they are housed in the barn.

Imre and four other like-minded dairy farmers formed a small cooperative in an effort to secure a fair price for their milk. While they had partial success with processors, he ultimately decided to sell his milk directly to consumers through vending machines in the nearby town of Miercurea Ciuc and produce artisanal cheeses. He also sells his spelt by producing spelt flour to supplement his income.

Applied techniques

• Min-Till

He has gradually moved away from plowing and now only performs shallow subsoiling with a cultivator, at a maximum depth of 10 cm, while preparing seedbeds separately.

• Direct Sowing - A Challenge

Some regenerative farming practices, such as direct sowing, have not been successful for him. Since he doesn't plant grain on the same parcel every year, weeds often dominate the crop. As an organic farmer, he cannot use herbicides, which led to the difficult decision to sell his direct seed drill.

• Organic Fertilization

Thanks to his livestock, he is able to return organic manure to his fields, a practice that is rare among arable farmers in his region, most of whom rely on artificial fertilizers and, to some extent, green manure. The prevalence of mixed farms has diminished in his area, making this approach stand out.

• Crop Rotation

He practices crop rotation on 5 hectares of his 25-hectare farm, alternating between legumes—such as alfalfa, trifolium, and vetch—for 4-7 years, followed by a year of grain production. This allows for improved soil health and reduced pest and disease pressure.



Cover Crops

Cover crops are used primarily for soil improvement and weed control. If grain is sown in the fall, legumes are planted in the spring. Peas and vetch are typically sown as a second crop after harvest and are left in place without termination. Before planting grain in the spring, the remaining vegetation is mowed in May-June.

• Afforestation

The strip plot structure of his land presents challenges for implementing afforestation. As the hillsides become less suitable for arable farming, he believes the entire area should be afforested, which could bring both ecological and economic benefits.

• Rotational Grazing

Every 10 years, he reseeds his meadows and pastures with a mix of at least 4-5 species (e.g., white fescue, red fescue, alfalfa, knotweed, meadow fescue/phleum, English fescue). Each pasture section is about 5 hectares, and the animals graze for around one week, depending on weather and grass condition. Older, natural grasslands yield less, so the animals are moved more quickly across them, while the sown fodder requires less rainfall and is more resilient to changing climatic conditions.

• Permaculture

He manages a 15–20-hectare area based on permaculture principles, creating a selfsustaining wet ecosystem. In addition to planting a variety of fruit trees and bushes, he operates a thriving vegetable garden. He also designs and constructs wetland areas and small lakes, which are interconnected by swales and gravity-fed pipes to optimize water flow and conservation.

Results

- The quality of his soil has significantly improved. While neighboring farmers often struggle to prepare seedbeds in the fall during certain years, he faces no such challenges. When they asked for help with their seedbeds, they were surprised to learn that the difference wasn't due to his machines, but rather the improved, looser soil structure he had achieved through permaculture practices.
- His yields are on par with those of conventional farmers, but with much lower input costs. By using less machinery, fuel, and chemicals, and reducing tillage, he requires fewer working hours, leaving him more time for other activities.





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Future Plans

- Imre is convinced that this approach is the future of farming. He plans to continue expanding the afforestation of his land and further enhance its water retention capacity. To achieve these goals more efficiently, he hopes to consolidate his parcels, streamlining his operations for greater sustainability.
- The quality of his soil has improved significantly. Neighboring farmers have had trouble preparing seedbeds in the fall in certain years, while he had no difficulty doing so during the same period. They asked him to help them prepare seedbeds with his machines, but it was not his machines that were the cause of the difference, but the changed, looser soil structure.



• His yields are at least as good as those of conventional farmers, but he has much lower input costs, as he uses less machinery, fuel, and chemicals. In addition, fewer working hours are sufficient for reduced tillage, which leaves him more time for other things.

Feedback on policy

- Legal recognition and clear definitions for wooded pastures are crucial to promote environmentally and economically sustainable land use in the region.
- Developing animal welfare subsidies that better account for the needs of extensive livestock farming could significantly benefit the environment. Currently, extensive farming practices—known for their positive environmental impact—are neither incentivized nor properly compensated.
- Farmers would greatly benefit from a more systematic approach to providing information and communication about available subsidies and regulations, ensuring they have the resources needed to make informed decisions.



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