



Agroforestry Network

FOUNDED BY VI AGROFORESTRY

Seven reasons to invest in agroforestry for post-war reconstruction and reform efforts in Ukraine

Agroforestry Network in Sweden and its partner organizations in solidarity with Ukraine

Agroforestry is a multifunctional land-use system that integrates woody vegetation with crops and animal production, which can improve the resilience of yields and livelihoods and contribute significantly to environmental sustainability. This policy brief has been compiled by Agroforestry Network and its partner organizations in solidarity with Ukraine. It highlights seven reasons to invest in agroforestry for post-war reconstruction, green transition and integration of Ukraine into the European Union. A range of current needs and recommendations are also presented to support the expansion of agroforestry – both to strengthen resilience in this time of war, but also long term, to mitigate and adapt to the climate and biodiversity crises. Ukrainian actors from different sectors have been involved and also suggested ideas for national and bilateral collaboration as well as contact details (the appendix) to actors in the sector of agroforestry in Ukraine and Sweden.

1. TIMES ARE TURBULENT, AGROFORESTRY CAN HELP

In addition to the dire socio-economic challenges set off by the COVID-19 outbreak, the large-scale Russian invasion of Ukraine has had far-reaching political, environmental, economic, and social consequences in Ukraine and the whole of Europe. It is even affecting the energy, food, and finance systems globally (Gallo-Cajiao et al. 2023, Pereira et al. 2022a,b, Tollefson 2022). This turbulence is exacerbated by ongoing crises related to climate, land use change, and biodiversity loss (IPBES 2018, Pereira et al. 2022a,b, Tollefson 2022). Most critical is the situation in Ukraine which is now receiving and seeking support to not only resist the invasion, but also to strengthen its long-term resilience and facilitate a green transition, as well as to integrate its agricultural policies to EU's as part of their accession process.

Ukraine ranks among the world's top agricultural producers and has the largest share of arable land among all European countries (World Bank, 2024; see Box 2). The eastern, southern, and central parts of Ukraine have the largest share of agricultural land, comprising approximately 70 to 85% of the total. Some of this land is currently occupied and much of it is under constant bombardment.

The recovery and sustainable development of Ukraine's farming sector is of special concern, both for national food

security and export. Not the least, since Russia has systematically targeted the agricultural sector, aiming to minimize both production capacity and trade. Consequently, there has been widespread chemical pollution of air, water, and soil, and large parts of the country has been contaminated with landmines and unexploded ordnance. In addition, agriculture in Ukraine is suffering from distortions of the supply chains for inputs like seeds, fertilizers and equipment. The war has also taken a heavy toll on Ukraine's forests, and important tree shelterbelts (see photo on page 4), particularly in the eastern part located in the combat zone. These forests play crucial roles for soil protection, biodiversity and water retention, particularly important for productivity of agricultural land.

In this context, different agroforestry systems (see Box 1) could play a significant role, as they can contribute to both urban and rural resilience during and after political, economic, and natural disruptions (Barthel et al. 2015, 2019, Tidball and Krasny 2014). Moreover, they contribute to forest conservation and reduce dependency on external inputs as synthetic fertilizers and pesticides (Agroforestry Network 2018). Adhering to the principles of ecosystem restoration, agroforestry systems can yield diverse benefits, such as critical contributions to food security and nutrition in times of crisis while also facilitating sustainable post-war restoration, e.g., by fulfilling Ukraine's commitment to establish

BOX 1 – WHAT IS AGROFORESTRY?

Agroforestry is a collective name for land-use systems and technologies where woody perennials (trees, shrubs, palms, bamboos, etc.) are deliberately used on the same land-management units as agricultural crops and/or animals. Agroforestry can also be defined as a dynamic, ecologically based, natural resource management system that, through the integration of trees on farms and in the agricultural landscape, diversifies and sustains production for increased social, economic and environmental benefits. It contributes to many benefits, or ecosystem services, such as wind protection, water retention, landscape restoration, food and medicine, fertile soil, erosion control, animal feed, firewood and carbon sequestration.

Agroforestry includes three main types of agroforestry systems (FAO, 2024):

- Agrisilvicultural systems are a combination of crops and trees, such as alley cropping.
- Silvopastoral systems combine forestry and grazing of domesticated animals on pastures, rangelands or on-farm.
- Agrosilvopastoral systems, that integrate trees, animals and crops – illustrated by homegardens involving animals as well as scattered trees on croplands used for grazing after harvests.

In Ukraine, planting of shelterbelt trees alongside large-scale crop fields is crucial for the country's large production of oilseed and cereal crops.

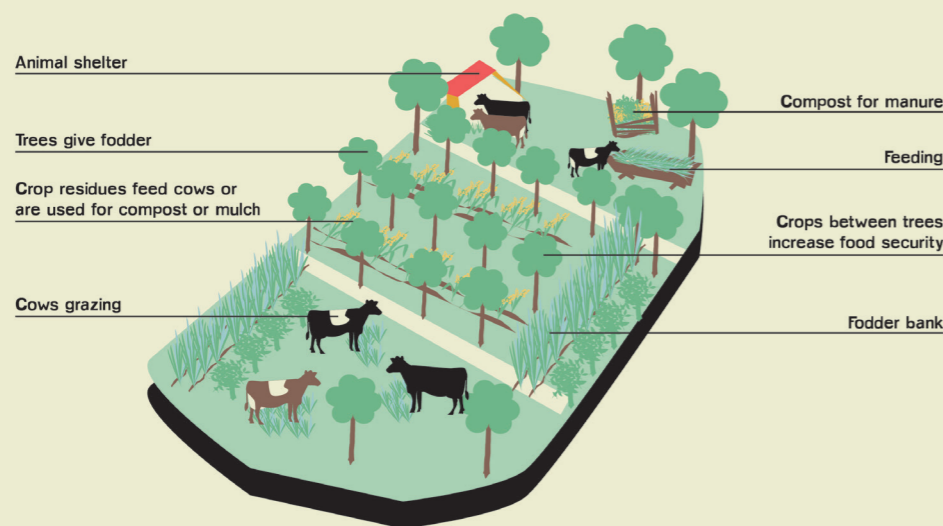


Photo: Ganna Lobchenko

Photo: Sun flower field with shelterbelt trees in the background. Ukraine is one of the world's top producers and exporters of sun flower oil.

1 million hectares of new forests within 10 years (Presidential Order 228/2021). Importantly, this can be achieved without compromising other valuable ecosystems such as steep grasslands, meadows, and wetlands.

2. IMPROVED LIVELIHOOD OPPORTUNITIES AND FOOD SECURITY IN UKRAINE

Agriculture is a major source of livelihood for the about 30 percent of Ukraine's population that lives in rural areas. It is also responsible for about 40% of export revenues as Ukraine is a top 5 global exporter of wheat, sunflower oil and other crops. High yields have, however, in recent decades increasingly been realized through unsustainable intensification relying on large monocultures as well as use of chemical pesticides and fertilizers. This is especially true for vegetable production intended for export. In this context, it is now of key importance to scale up agroforestry and other sustainable farming approaches.

In urban areas in Ukraine, urban community gardens (UCG) can be of particular importance. They contribute in various ways to the Global Goals of inclusive, safe, resilient, and sustainable development in urban areas (SDG 11). These gardens are plots of land cultivated by community members in urban areas, for growing fruits, vegetables, berries and herbs, which can help ensure food security in times of crisis. UCGs are often situated in parks, or in vacant lots or other unused spaces. They are managed and maintained by community members, representing a grassroots effort to create positive change in their communities (Bonow et al. 2020; Barthel et al., 2015; Bergame, 2022).

Support for the emergence of new UCGs and scaling-up of existing ones have already improved urban livelihoods in many places around the world. In Ukraine, such support could include direct knowledge transfer for practitioners, and consultations for decision-makers about opportunities and constraints in scaling up UCGs, particularly during turbulent times. This can be applicable to urban spatial planning and policy development, while identifying systemic constraints that require policy attention. In Ukraine, this will be particularly relevant for rebuilding cities and aiding in the post-trauma recovery of citizens (WWF & BCG, 2022).

BOX 2 – AGRICULTURE AND FORESTRY IN UKRAINE: AN OVERVIEW

- One of the world's top producers and exporters of cereals, sun flower oil and other crops.
- Around 70% of the territory is agricultural land, with arable land accounting for about 32 million hectares, which is about 30% of Europe's arable land. Large-scale, intensive, industrial and export-oriented production dominates the plains.
- Forests cover approximately 16% of the country.
- About 70 agricultural companies operate 25% of the arable land, mostly as monocultures of cereals and oilseed.
- Family farms, rural households, household gardens etc. are spread over the country and produce a substantial share of potatoes, vegetables, fruits and berries in Ukraine.
- In the mountains, e.g., the Carpathian region, the production systems are more small-scale, embedded in diverse mosaic landscapes including mixtures of grasslands, fields, pastures and forests (see Box 4). These areas are responsible for a smaller part of national food production, but are important hubs for maintaining cultural heritage and traditional practices.

3. SOCIAL COHESION, CULTURE AND MENTAL HEALTH

Agroforestry systems can contribute to social cohesion and promoting community engagement in both urban and rural development (Delshad 2022, Bieling et al. 2014), as it provides space for social interactions and physical activities (Elbakidze et al. 2021), and engages people in creating more sustainable cities and rural landscapes (Bonow et al. 2020, Delshad 2022, Garrido et al. 2017 a,b). Recent studies in Europe (e.g., Fagerholm et al., 2020) reveal that people from many walks of life perceive agroforestry as something that can be crucial for their quality of life. It has also been reported that agroforestry can help people overcome trauma and mental health issues (Minkoff-Zern et al. 2023).



Photo: Petro Tamopylsky

Photo: Damages to important tree shelterbelts in Ukraine, from trenches, shelling, fires, bombings, chemical pollution, and construction of fortifications are common during the war. The total area of such windbreaks was about 446 thousand ha before the war, protecting 13 million hectares of arable land and agricultural landscapes.

4. GREEN TRANSITION AND INCREASED RESILIENCE THROUGH NATURE-BASED SOLUTIONS

Agroforestry systems provide diverse benefits to people (called ecosystem services or nature's contributions to people), and are increasingly acknowledged in both EU and non-EU countries (Fagerholm et al. 2020, Elbakidze et al. 2021) (Box 3). For example, agroforestry is increasingly seen as a nature-based solution to build resilience to climate change (Agroforestry Network 2018, IPCC 2022, Mosquera-Losada et al. 2018). Trees act as windbreaks and help regulate microclimates, and the water cycle, making agricultural systems more resilient to climate-enhanced extreme weather events like droughts, dust storms or floods. Moreover, agroforestry can contribute to climate change mitigation through carbon sequestration in biomass and soils and decreased greenhouse gas emissions (Yukhnovskiy et al 2017).

By diversifying agricultural practices and income streams through agroforestry as one of the agroecological approaches, Ukrainian farmers can also build resilience against market disruptions and economic instability caused by the ongoing crisis.

Today, agroforestry systems are in sharp decline across Europe, including Ukraine (Godinho et al., 2016; Plieninger et al., 2015). One specific example is the decline of shelterbelts (see Box 4). Between 1949 and 1953, around 100 thousand hectares of shelterbelts were established annually in Ukraine. However, since the 1980s, there has been a significant decline in such windbreak plantations (Yukhnovskiy et al 2021), and recently the war has caused considerable additional destruction due to their role as defensive elements.



Photo: Oleksandr Sovakov



Photo: Olesya Petrovych

5. BIODIVERSITY CONSERVATION, CULTURAL AND RURAL SUSTAINABILITY

In rural contexts, agroforestry can also preserve cultural landscapes, traditional knowledge, and biocultural diversity (Garrido et al. 2017a,b; Elbakidze and Angelstam 2007). One example is the agroforestry systems in the Carpathian Mountains of western Ukraine, which have been identified as an important part of Europe's cultural heritage (e.g., Elbakidze and Angelstam 2007). They are the result of knowledge, innovations, and practices of local communities, which integrate small-scale agriculture, animal husbandry, and tree management. These agroforestry systems are part of a mosaic landscape that sustains the production of multiple goods and services, providing livelihood security and quality of life, as well as contributing to natural and cultural heritage (e.g., Elbakidze and Angelstam 2007) (See Box 4). Systems of shelterbelts planted alongside large fields can also contribute to biodiversity conservation, and often act as important green corridors for animals and birds (e.g., Sreekar et al. 2013).

Photos: Left: Shelterbelts provide important green corridors for migrating wildlife such as these moose. Right: Trees alongside crop fields maintain biodiversity by providing diverse habitats for flora and fauna.

6. BETTER UNDERSTANDING OF AGROFORESTRY IN UKRAINE IS NEEDED

Given that agroforestry provides multiple benefits across local and global scales, but is currently in decline in Europe (Rubio-Delgado et al., 2023), it is crucial to generate more evidence-based knowledge about the role of agroforestry in sustainable urban and rural development across diverse European contexts. This is particularly important for Ukraine and other countries in Eastern Europe where there is a scarcity of published studies on agroforestry in international scientific journals. Ukraine has, since the 1990s, experienced a number of big changes in governance systems and socio-economic structures in the wake of the transition from

BOX 3 – THE MULTIPLE BENEFITS OF AGROFORESTRY SYSTEMS

Agroforestry systems have the potential to deliver a diversity of food together with a broad range of other ecosystem services, as illustrated in the figure. The “flower diagrams” illustrate the potential ecosystem services production of different land uses. The length of each petal represents how much of a particular ecosystem service that is produced. (Illustration adapted from Foley et al. 2005).

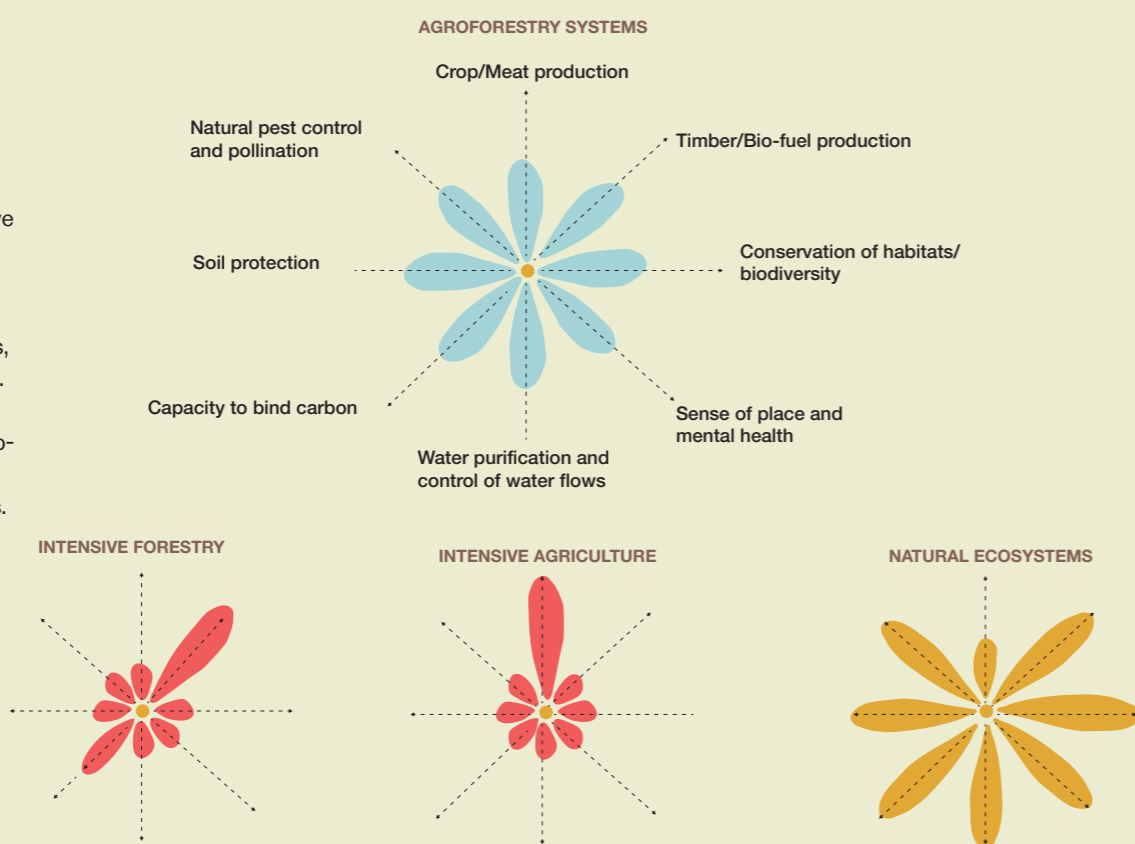


Photo left: Marine Elbakidze



Photo right: Oleksandr Sovakov

BOX 4 – AGROFORESTRY IN UKRAINE – A VARIETY OF LAND MANAGEMENT SYSTEMS

Agroforestry systems in Ukraine are extremely diverse, ranging from small-scale to large-scale, from extensive to intensive production, and including various degrees of different mixes of trees, shrubs, hedges, crops and livestock. The picture to the left from the Carpathian Mountains illustrates small-scale agroforestry as part of a rural mosaic landscape, including everything from private gardens to mixtures of grasslands, fields, pastures and forests. To the right there is a photo depicting a shelterbelt planted alongside a more large-scale intensively grown crop field with industrial production. The predominant agroforestry system on

the plains is silvoarable, primarily shelterbelts. The average shelterbelt coverage before the invasion was 1.4% falling short of the expected 3%. Shelterbelts protect soil, crops and livestock from strong winds, prevent the movement of pesticides to other areas and settlements, provide diverse habitats for flora and fauna, as well as production of both wood (timber, energy etc.) and non-wood products (for example honey). Providing habitat for birds and insects, shelterbelts are also important for natural predators of crop pests, and serve as “green corridors” for wildlife migration.

planned to market economies. Armed conflicts, most notably the Russian invasion of Ukraine, have dramatically heightened instability throughout the region (Pereira et al. 2022 a,b, Sousa et al. 2022). In-depth comparative analyses of different agroforestry systems in Ukraine can significantly improve understanding of their role in supporting more sustainable livelihoods and how they can contribute to the European Green Deal.

7. A WAY TO ALIGN UKRAINE'S LAWS AND SUSTAINABILITY POLICIES WITH THE EU

The aspiration of Ukraine to become a member of the EU is currently resulting in the aligning of national laws and policies with important pieces of EU legislation. This harmonization does not only come with many benefits from a security perspective, it also opens up a range of opportunities for sustaining and strengthening agroforestry practices in the country. Agroforestry could actually play an important role for Ukraine to comply with chapter 27 (on climate change and the environment) of the EU accession process, one of the most difficult chapters for aspiring members to complete. However, EU integration can also entail challenges to the natural values and long-term sustainability of traditional agroforestry systems, such as the silvopastoral ones in the Carpathian ecoregion. Development of transportation infrastructure, and agricultural intensification are some of the potential threats. The most powerful current threat, however, is

Agroforestry systems also align with European-level initiatives such as the Pan-European Biodiversity and Landscape Strategy and the European Landscape Strategy.

the ongoing Russian invasion, which, as mentioned above, has caused enormous environmental damage and led to increasing pressure on agroforestry landscapes.

One example of how agroforestry could support EU integration, and vice versa, is through its alignment with the new EU Forest Strategy for 2030, which acknowledges cultural landscapes, traditional practices, and other cultural values of forests as some of the ways to achieve local and regional sustainable development. Such landscape values are also included in the EU's new Common Agricultural Policy (for 2023–2027) which promotes the expansion of agroecological practices, including agroforestry. Thus, efforts to support agroforestry in Ukraine can not only aid in the EU accession process, but also make Ukraine a valuable partner in EU's transition to sustainable agriculture, once membership has been granted.

NEEDS AND RECOMMENDATIONS:

Several needs in relation to agroforestry in Ukraine can be identified across development, networking, research, and legislative perspectives:

Development perspective:

- Develop and apply a precise methodology for assessing the extent of damage in agroforestry from the ongoing war in Ukraine.
- Undertake a comprehensive land and forest inventory of shelterbelts to inform strategic planning, ensuring efficient resource use and sustainable development.
- Involve local communities in the legislative and restoration process, ensuring that their needs and concerns are adequately addressed on the regional and national levels. Consider establishing pilot areas and demonstration facilities with appropriate management plans and capacity building.

Networking and bilateral cooperation perspective:

- Encourage collaboration between development institutions and organizations, academic and research organizations, and non-governmental organizations in Ukraine and Sweden. Networking can foster information exchange, joint projects, and a stronger agroforestry community.
- Facilitate knowledge exchange programs between Swedish and Ukrainian researchers, farmers, and policy-makers. This can include study tours, workshops, and training sessions on agroforestry practices.
- Provide financial support for local initiatives that promote

agroforestry practices in Ukraine. This can be in the form of grants, subsidies, or low-interest loans to incentivize farmers to learn about and adopt agroforestry and invest in sustainable practices.

Research perspective:

- Identify and analyze incentives to establish, develop and maintain agroforestry farms across different contexts in Ukraine, with special focus on agency and engagement of various stakeholders and community members.
- Explore how different types of agroforestry systems have reconfigured social practices and relations in Ukraine, including the overall social impacts of agroforestry.
- Investigate the transformative capacity of agroforestry in Ukraine, with emphasis on constraints and opportunities for scaling up agroforestry practices to contribute to resilient, and sustainable urban and rural development.

Legislative Perspective:

- Clearly define and recognize agroforestry in Ukraine's national legislation to provide a legal foundation for its practice, similar to what was decided in 2020 in a resolution for shelterbelt preservation on agricultural land by the Cabinet of Ministers of Ukraine.
- Clarify land use and ownership rights related to agroforestry practices to avoid uncertainties and conflicts.
- Develop a medium-term strategy aligning Ukrainian agroforestry practices with EU integration goals, emphasizing sustainable land use and ecosystem resilience.

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