

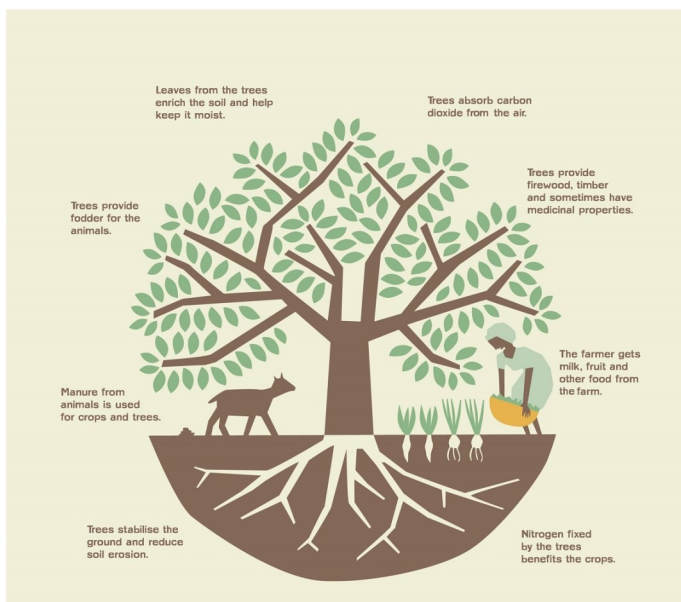
PRODUCTION OF FEEDSTOCK FOR FOOD AND ENERGY ON THE SAME LAND, THROUGH MULTIPLE- CROPPING PATTERNS AND AGROFORESTRY SYSTEMS

CORRESPONDING MODULE 2

Introduction

Agroforestry is a multifunctional, environmentally-friendly and modern system of land use by which we can reach economic, environmental and social benefits for the society.

Bulgaria has achieved good results in the establishment of agroforestry practices, such as: protective forest belts, forest farming (agricultural use of forest areas), silvopastures (forest-grassland complexes).



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Description

Successful implementation of agroforestry (AF) is traditionally known in Bulgarian forestry and agriculture. Particular success was achieved following the implementation of agricultural uses of forest area. Agricultural crops are being grown together with tree species either using intercropping techniques, or by planting in open areas prior to their scheduled afforestation. This is a classic type of widely used AF system whose ultimate goal is the initial cultivation of young forest plantations and its conversion into a forest.

Another AF, very important for Bulgaria, are Protected Forest Belts (PFBs). Protective forest belts are linear forest plantations designed to protect soil, civil engineering constructions and urbanized areas, and improvement of microclimate. The first forest belts were established in 1925 and in the early 50s of the last century began their broader application as AF practices. Now PFBs need improvement and some financial support in legislation available. Furthermore, the protective belts were designed as shelterbelts in line by planting appropriate tree species (poplar, acacia, willow, linden, sycamore, etc.) along ravines, canals, rivers, reservoirs, roads, fields, and meadows for stabilization of river banks, flood abatement and achievement other environmental benefits.



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Forest farming agroforestry practice has also been developed in Bulgaria, in which the reconciliation of the naturally and artificially created trees and bushes, and the business of agricultural activities is being established for a longer period of time. Farms are used for the production of edible mushrooms, medicinal plants, fruits (strawberries, raspberries, blackberries, apples, pear, aronia, etc.) bee and oil-bearing crops, ornamental plants, trees and more.

This agroforestry practice in Bulgaria has serious achievements in cultivation of fruit-productive forest trees in forest areas. Plantations by walnut (*Juglans regia*), hazel (*Corylus avellana*), almond (*Amygdalus communis*), wild cherry, rowan and others were created.

In Bulgaria agricultural areas cover 47% and forest areas 37% of the country's territory, respectively. As a modern form of land use, agroforestry is a viable alternative for providing additional income for land owners in many areas of the country, particularly those formed by tobacco-production. Agroforestry can push up agricultural returns by diversification of production and can give many ecological and social benefits for society. The perspectives are targeted at the production of forest fruit tree species with high-value tree timber, and forest farming.





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The support is available

“Bulgarian Association of Agroforestry” (BAA), an association with public utility activity, was established in 2017 in Sofia. Its main objectives are to encourage the adoption of agroforestry practices (afforestation of tree species within agricultural systems) in Bulgaria, work to disseminate information and strengthen links between agroforestry professionals, the general public and practitioners, support the introduction of research in agroforestry, work to adopt policy decisions that could encourage the use of trees on farms in Bulgaria and Europe.

There are multiple policies, strategic and program documents and legislation in Bulgaria, promoting the development of various agroforestry systems. The Law on ownership and usage of agricultural land (LOUAL); the Law for Forest (LF), the Law on Protection of Agricultural Land (LPAL); the Law for supporting agricultural producers (LSAP) etc. are in action nowadays.

Bulgaria, as a EU member state committed to harmonize its legislation and policies with those of the EU. With regards to agricultural policy, Bulgaria keeps to the principles and accepts the objectives of the Common Agricultural Policy (CAP), which is consistent with the general strategy of the



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Union - Europe 2020: for smart, sustainable and inclusive growth.

The Ministry of Agriculture and Forestry is the authorized institution that endorses direct payment schemes and support under the CAP; provides information to the owners; approves actions for preservation of the earth and approves the measures of appropriate systems and techniques for soil treatment; activities for restoration, and for maintaining and improving the soil fertility, etc.

Up to 2020, nearly 800 million € were provided for the “green payments” in Bulgaria. In the forestry sector the rules are determined by the LF and the Regulations for its implementing. The agroforestry system “protective forest belts” is regulated and categorized in the LF.

In addition, agroforestry should also be included as a relevant measure in the New Agroroecological Programme of Bulgaria, and the New National Programme for Sustainable Management of Lands. Also, Agroforestry could be promoted by developing new Programmes in the frame of National Schemes for Government Aid by the Ministry of Agriculture and Food.

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A good example

The project described presents a regenerative landscape design for a site in Todorovo, Bulgaria. It is planned to establish an agroforestry system known as alley cropping where rows of mixed species of edible trees and shrubs are planted at intervals with spaces for herbs, forage, and/or grain crops to be grown in between. It's a dynamic system that is inherently diverse, providing multiple yields and excellent habitats for wildlife while at the same time being relatively resilient to a changing climate.



An essential component of the design will

Further Information

1. http://www.researchgate.net/publication/308928146_Agroforestry_in_Bulgaria_history_presence_status_and_prospects
2. <http://europeanagroforestry.eu/countries/Bulgaria>
3. <https://balkanecologyproject.blogspot.com/2014/07/nitrogen-fixing-species-for.html>



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be the nitrogen-fixing perennial plants within the community of fruit and nut trees. These plants will be pruned at regular intervals to provide biomass for surface mulch and to release a biological source of nitrogen to the surrounding productive plants and soil life by means of root shed associated with top pruning.

When selecting plants for the nitrogen-fixing component of this design, it is necessary they could withstand record lows of -28 (Zone 5), tolerate some shade, are fast-growing, trimming and coppicing-tolerant, able to grow in clay soils, known to provide significant quantities of nitrogen, easy to propagate from seed and provide some food for humans and other animals. The following plants fit the criteria.

- *Elaeagnus angustifolia* - Oleaster, Russian Olive

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- *Elaeagnus*



commutata - Silverberry, Wolfberry

- *Elaeagnus umbellata* - Autumn Olive. Autumn Elaeagnus



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- *Caragana arborescens* - Siberian Pea Tree



It is also planned to grow the nitrogen-fixing plants for this site from seed and to involve the local community in doing so. Many local people, particularly the older generation are skilled horticulturalists with many seasons of experience behind them.



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It is important to include a number of these people in the process of propagation, each one functioning as an individual unit. This will keep the propagation process small scale, making it far easier to use biological methods. The propagation begins in the Autumn as *Elaeagnus* spp. all require cold stratification unless they are sown immediately after they are picked. *Caragana aborescens* is sown later. When propagating from seed the advantage is to select the strongest seedlings. Another significant reward is that genetic diversity is promoted within the populations, something not likely to find in the majority of cloned nursery stock.

ANNEX - STRUCTURE OF MODULE CONTENT TO PREPARE SLIDES

Module Name:
The name of the partner:
Country:



The name of the module	
Target group involved	
Current information about the topic	
Principles of the specific module	
Basic terms/measures of the module/topic	
Training materials (tasks, case studies, exercises)	
Short description of the materials	
Link of the online resources (film or video resources)	
Specific images (to support the purpose of the resources)	
Duration	
Materials	
No of Learners/Representatives	
Individual or group work	
Step by step guide	