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Nonprofit Korlátolt Felelősségű Társaság*

# AGROFORESTRY RESEARCH AND DEVELOPMENT IN HUNGARY

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## Introduction

In the last century agroforestry was a widespread technology of land use in Hungary. During the last decades it has been regressed and disappeared from large areas of the Hungarian countryside. The aim of this document is to give a general overview of the role of agroforestry, with special regard on its development and recently running research projects in Hungary.

## Past and present of agroforestry in Hungary

Hungary is a traditionally agricultural country, therefore the traditional agroforestry technologies (windbreaks, shelter-belts, hedgerows, small-scale orchards and vineyards, wooded meadows, grazed forest and wood pastures had been applied in large scale in the past centuries.

With the aim to increase the domestic agricultural productivity and wood production basis, and to decrease the national wood import dependency, a large-scale state-financed research project on protective wood lands started in the early sixties, led by the University of Forestry and Timber Industry (today called University of West Hungary - UWH). The aim of the research were to identify the ecosystem services and the effects on agricultural productivity of protective woodlands, so as to justify their financial effects or measured wood fragmented up to that time. As a result of that multi-annual research and development activity the area of forest belts increased further until the 80's.

From the early nineties the positive trend of increasing area of protective forest belts first stopped, then reversed. As the outcome of the privatization, the landscape of the Great Plain had undergone a structural transformation, resulting in more diversified land use, a lot of small parcels together with new large estates. The former area of forest belts (35 000 hectares) has decreased by 50% up to this time.

In Hungary the total ratio of agricultural territories - croplands, pastures, plantations, grasslands - is 60% of the territory. 85% of these are classified agro-environmentally sensitive areas. The high ratio of "risky" territories demonstrates the strong need for the development of rural areas, among others the implementation of innovative agricultural technology able to increase social-economic sustainability. As a consequence rural development has become one of the hot issues in the last years in Hungary.

## Current State of Agroforestry-Related Research in Hungary

Followed from the forest-belt-system development project in the '60s and ran over the course of several decades, a new line of experiments has started some years ago in the UWH Faculty of Forestry. The aim of this research program is to develop a model for the designing and construction of forest belts by the combination of digital modelling and field sampling with analytical methods. The examination and development of windbreaks and shelter belt system will be continued within the frame of a national project followed from the forest-belt-system development project.

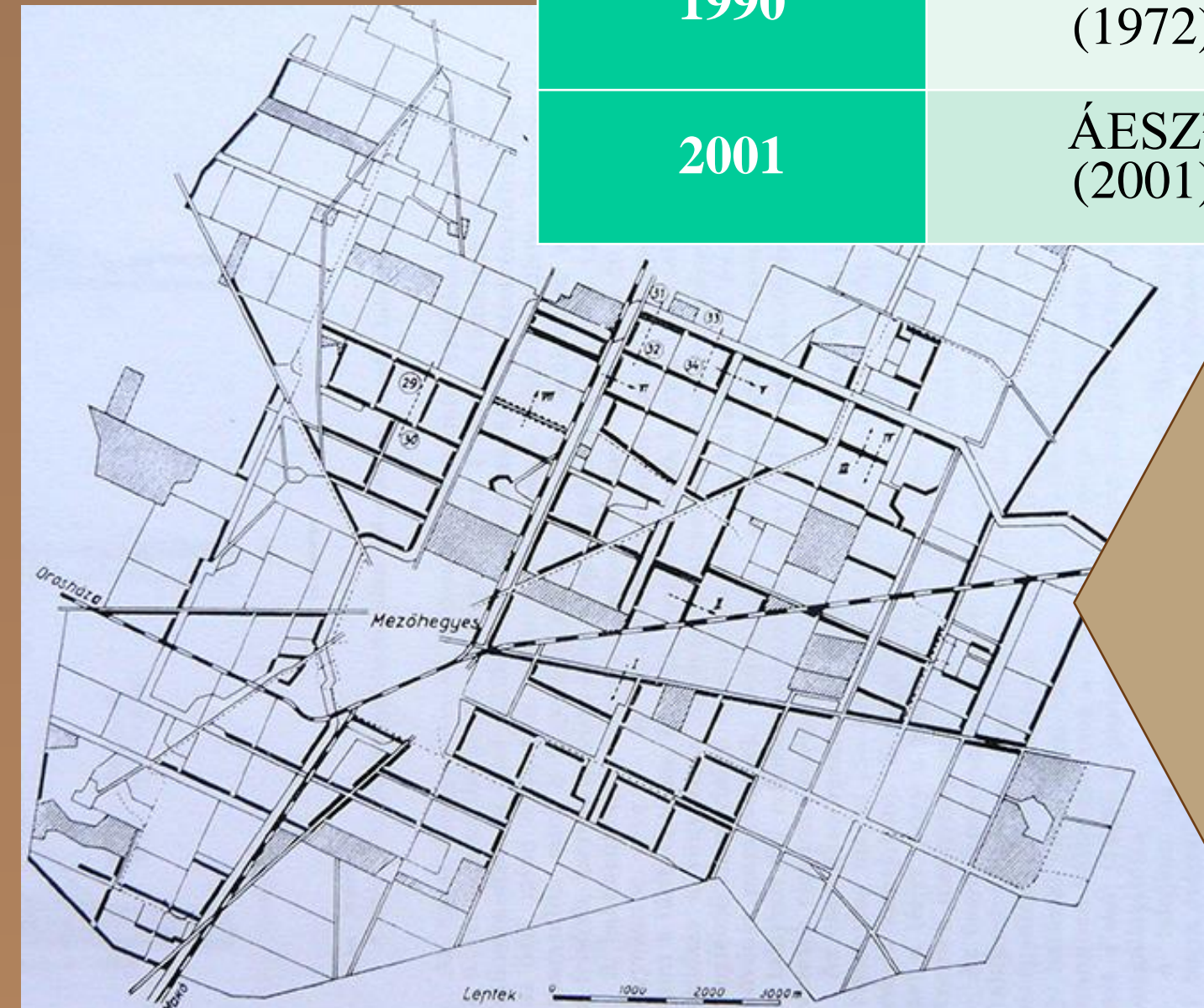
In 2012 the UWH Cooperational Research Centre, together with local cooperatives and farmers have set the objective of integrating modern agroforestry technologies in their on-farm agricultural activity and establishing new experimental sites available for future research and demonstration purposes. The long-term goal is to study and develop agroforestry technologies under domestic circumstances able to support the development of the Hungarian countryside in its complexity. This cooperation will also contribute to the „AGFORWARD” international research project on agroforestry.

The research of traditional wood pastures, wood meadows and grazed forest have started at Institute of Ecology and Botany, Centre for Ecological Research, Hungarian Academy of Science in 2006. The aim of our work to encourage the sustainable silvopastoral management. This work focus on vegetation, landscape history, traditional ecological knowledge and nature conservation issues of the wood pastures, grazed forest and wooded meadows at country level and 10 field sites in different part of Hungary. Currently approximately 5500 ha of wood-pasture can be found. This extension now appears small compared to its former significance. The main tree species are oak, wild pear, beech, hornbeam, ash and willow. The growing interest of farmers and conservationist in the traditional silvopastoral systems is highlighting the importance of traditional ecological knowledge of the agroforestry systems. Our work will contribute to the High Nature Value Farming project of the "AGROFORWARD".

In the Corvinus University of Budapest, Department of Ecological Farming and Sustainable Production Systems an R&D project on forest gardens started in 2010. They established a test plantation on the Department's Experiment Field near Budapest, on a 1,7 ha territory. Materials were mainly fruit trees combined with forest trees and bushes from 14 species with 36 cultivars were planned to plant on the plot. The purpose of the forest garden was both educational and experimental by collecting experiences with the establishment, maintenance and utilization of forest garden under the given conditions.

Date	Source	Volume	Location/State	Note
1960	Gál (1961)	1500 km	Alföld	shelter-belts
		1000 km	Kisalföld	
1970	Danszky (1972)	34977 ha	nation-wide	protective forest strips
1975	Gál and Káldy (1977)	9891 ha	realized	shelter-belts
1976-1990		4091 ha	planned	
1975	Keresztesi (1991)	22600 ha	realized	sum of forest belts
1975		8800 ha	realized	green belts
1975-1990		20600 ha	planned	
1990		29400 ha	planned	
1990	Danszky (1972)	33400 ha	planned	protective forest belts
2001	ÁESZ <sup>2</sup> (2001)	16417 ha	registered	shelter-belts

*Forest belts in Hungary in terms of numbers and decades (Frank and Takács, 2012)*



*Forest-belt system at the one of 4000 state farms (Mezőhegyes) in Hungary in the early sixties (Gál, 1961)*

*Experimental forest garden of the Corvinus University at Soroksár, Pest County (photo by Zita Szalai)*



*Agroforestry systems help to maintain traditional livestock types, e.g. Hungarian Great Grey Cattle. Kölked, Baranya County. (photo by Anna Varga)*

*Young alley cropping (Paulownia & lucerne) planted in 2012, Fajsz, Bács-Kiskun County (photo by Andrea Vityi)*



From this year agroforestry appears among the "determinative research and development subjects" of the Ministry of Rural Development. This development and the increasing number of research projects show agroforestry rising again in Hungary.

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