Lessons learnt: Wood pastures in Hungary

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1 Context

The AGFORWARD research project (January 2014 - December 2017), funded by the European Commission, is promoting agroforestry practices in Europe that will advance sustainable rural development. The project has four objectives:

1. to understand the context and extent of agroforestry in Europe,
2. to identify, develop and field-test innovations (through participatory research) to improve the benefits and viability of agroforestry systems in Europe,
3. to evaluate innovative agroforestry designs and practices at a field-, farm- and landscape scale, and
4. to promote the wider adoption of appropriate agroforestry systems in Europe through policy development and dissemination.

This report contributes to Objective 2 in that it focuses on the field-testing of an innovation within the "high nature and cultural value wood pastures" participative research and development network. This report contributes to Deliverable 2.5: Lessons learnt from high nature and cultural value agroforestry.

2 Background

The initial stakeholder report (Vityi and Varga 2014), the research and development protocol (Vityi and Varga 2015a), and the system description report (Vityi and Varga 2015b) provide background data on high nature and cultural value wood pastures in Hungary.

Wood pastures and grazed forests as part of the silvopastoral systems have always been an integral part of land use in Hungary as demonstrated by a number of archive, historical sources and oral history data (Andrásfalvy 2007; Varga et al. 2016; Varga 2017). The economic and social value of such systems is hinted by the name "Glandifera Pannonia" (meaning 'acorn bearing Pannonia') to denominate Transdanubia in the Roman Age. The significance and operation of silvopastoral systems has reduced substantially in the past 100 years, and common ownership of pastures in forested areas has vanished almost entirely (Varga et al. 2015). It is estimated that there is currently only around 5500 ha of used or abandoned wood pasture in Hungary; with a third in a protected area (Bölöni et al. 2008; Varga and Molnár 2014). Grazing in forests is prohibited in areas officially qualified as forests. In recent years, agri-environment subsidies, nature conservation management practices, and the rising demand for organic food mean that some formerly abandoned areas are now farmed again as wood pastures. However in places this change is hindered by legal impediments such as complicated legal ownership structures. Benefits of silvopastoral systems can include high quality food products and the preservation and maintenance of high natural and cultural values. Hence when granting subsidies to tree planting, planting only and exclusively native tree species and local fruit varieties indigenous in the forestry landscape should be permitted, while preserving the natural values of the grassland. The term agroforestry is not widely used in Hungary but there are traditional wood pasture and wood meadow systems (Bölöni et al. 2011; Varga et al. 2016). Although there is significant interest in the benefits of agroforestry, there is a lack of basic knowledge about agroforestry practice and little information about who has established systems or is engaged in agroforestry research. It is evident that there is a need for a national agroforestry network in Hungary to disseminate information and set the basis for cooperation between agroforestry stakeholders (Vityi and Varga 2014).

3 Activities

The activities included researches in two main topics:

1. Investigating the best practices for establishing and managing high nature and cultural value wood-pasture at abandoned and ancient wood pastures
2. Increase awareness of the nature and cultural values of Hungarian wood pastures, through branding wood pasture products and education

The research and development for the wood pastures in Hungary was carried out at three levels: country, regional and local level. At the local level, research took place at two field sites: an abandoned (Tűzkövesbörc Farm, Pénzesgyőr) and an ancient (Kasztó, Bogyiszló) wood pasture.

4 Best practices for establishing and managing abandoned and ancient wood pastures

4.1 Country level

4.1.1 Reviewing innovations from the past

This first section considers silvopastoral systems, forest grazing, pannage, leaf-fodder and wood pastures in Hungary in the light of Hungarian ethnographic literature. The purpose of this research was to reveal the information contained in Hungarian ethnography on silvopastoral systems. In the course of that work, articles and papers on the subject of silvopastoral systems were reviewed in the entire List of References of the work Hungarian Ethnography (Paládi-Kovács 2001) and the Table of Contents of the periodicals Néprajzi Értesítő (Ethnographic Bulletin) and Etnográfia (Ethnography). Work published in relation to this topic were collected by reviewing references of additional articles and the bibliography of their respective authors. In the current study, the husbandry methods found in the collected references most closely matching the innovation objectives of agroforestry systems were reviewed mainly from the perspective of vernacular practices (for instance forest grazing, pannage, forage and litter gathering and their control). Based on the sources, data here presented are typically from the 18th, 19th and the first half of the 20th century, including, wherever they are available, particulars from the mediaeval period as well. From the available references and resources, the dominant fundamental role, functioning, and history of the silvopastoral systems from the 18th century to the first half of the 20th century were reviewed. The review showed that silvopastoral systems were crucial part of the Hungarian cultural landscape and biocultural heritage. The management of the silvopastoral practices decreased and some of them virtually disappeared like pannage and collecting leaf-fodder. Effectively the main current silvopastoral systems in Hungary are the wood pastures and illegal forest grazing (Varga and Molnár 2014; Varga et al. 2016). However a growing number of outdoor pig enterprises (e.g. Virágoskút Organic Farm[1]), acorn feeding cattle enterprises (e.g. Mozsi Farm[2]) or wild fruit product production (Váczakő Farm[3], and Wild edible food - erdokostolo.blogspot.hu) shows the interest and recent data of the ancient silvopastoral activities. The results are described in more detail by Varga A (2017). Innovation from the Past: Silvopastoral Systems in Hungary in the Light of Hungarian Ethnographic Literature. Acta Ethnographica Hungarica, 62:135-162.

[1] http://www.viragoskutwebshop.hu

[2] http://www.mozsimajor.hu/

[3] https://www.facebook.com/vaczakomajor/

4.1.2 Current situation with Hungarian wood pastures

According to our assessment currently approximately 33 000 hectares of wood pasture can be found in Hungary. 28% of the sites are protected areas, 60% are Natura 2000 sites, and 88% of them were wood pastures in the 1960s. Compared to the 1960s some areas are now afforested and overgrown with shrubbery and forest, representing a serious national and farm-level problem. Abandoned wood pastures which turn to be a forest can become registered forest areas, which means that grazing and wood pastures maintenance is prohibited in Hungarian Forest Law.

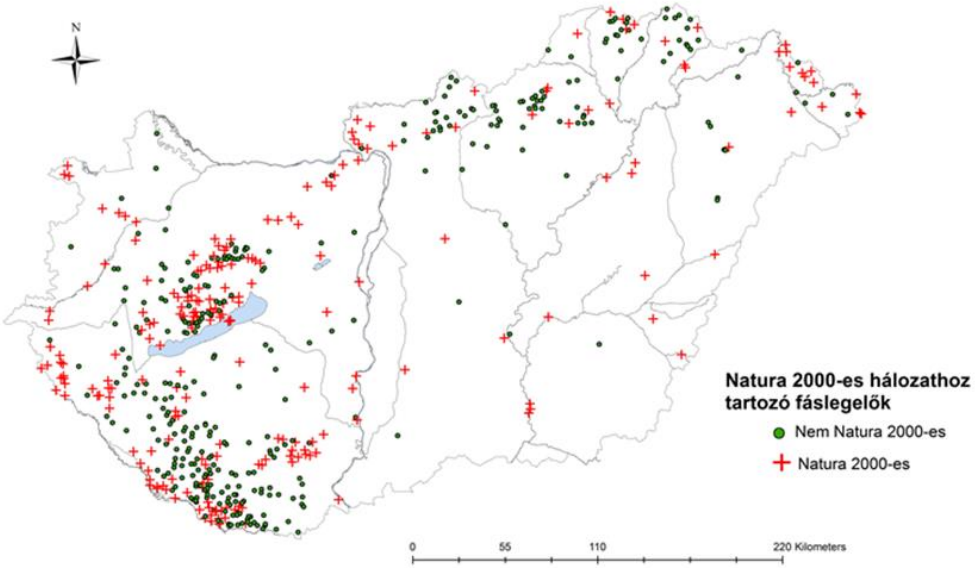

Figure 1. Map of the Hungarian wood pasture by Varga (2017). Red cross: the area is part of the Natura 2000. Point: not part of the Natura 2000.

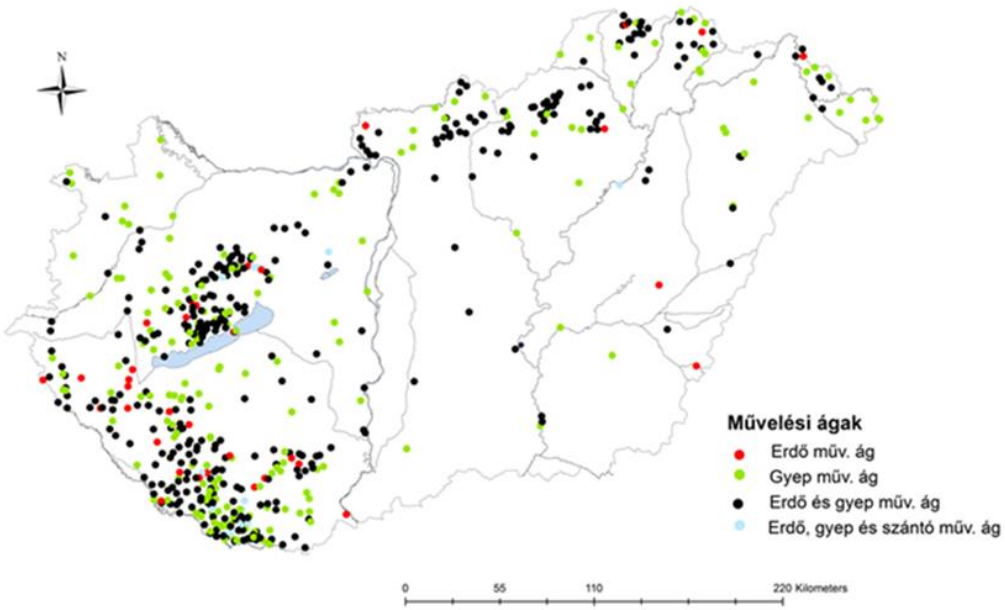

Figure 2. Registered forest and pastureland area of the recent wood pastures in Hungary by Varga (2017). Red: Forest, Green: Grassland, Black: Forest and Grassland, Blue: Forest, grassland and arable field.

The extension of the wood pasture in Hungary is significantly higher than the 5500 hectares identified by the MÉTA survey (Bölöni et al. 2008), which accounts not so much for the substantial increased of the land under wood pasture management but much rather the methodological differences between the two surveys. Herder et al. (2017) estimated a nearly similar size of silvopastures (36 000 ha) in Hungary. The diversity of the Hungarian wood pastures is demonstrated by the outcome of the cluster analysis and the findings of the PCA analysis, which points out, among others, that further investigation was necessary for the more exact identification of the different types of wood pastures. The two major groups were abandoned wood pastures and those which have a nature conservation perspective. The differentiation between these two types might be justified by the fact that many do not consider abandoned and afforesting wood pastures as such, in other words they do not study them from this perspective.

Based on the collected views and field findings it can be established that the most important problems in Hungary with respect to the preservation of wood pastures are:

1. overgrowth with shrubbery and afforestation arising from the abandonment of land use practices;
2. legal obstacles, partly arising from the same (forest grazing issue);
3. lack of herders holding the appropriate knowledge; and
4. disregarding landscape and habitat conditions in the provisions and legal regulations governing agriculture subsidies.

Plieninger et al. (2015) outlined a picture similar to the Hungarian one on the European level, highlighting that special natural and cultural heritage and husbandry needs of wood pastures ought to be taken into account more intensively when agricultural aids are regulated.

The results are described in more detail by the following two papers:

Varga et al. (manuscript): From farm scale to country scale: investigation of the high nature and cultural value wood pastures in Hungary, Central Europe.

Moreno G et al. (2017): Agroforestry systems of high nature and cultural value in Europe: provision of commercial goods and other ecosystem services. Agroforestry Systems. Online first. https://doi.org/10.1007/s10457-017-0126-1

4.2 Best practices at the local level

4.2.1 Renewing an abandoned area for high nature and cultural value agroforestry

The first site is the Tűzkövesbörc Wood Pasture Farm near Pénzesgyőr village, Veszprém county. This area was a community pastureland. It started to become abandoned at the end of the 1980s. During nearly 20 years of minimal management the wood pasture infilled with woody vegetation. Today the area is a mosaic of open grassland, renewed wood pasture with ancient trees and young trees, grazed closed canopy wood pasture and not grazed forest. Since 2007, the current owner and farmer has started to renew and manage this area as a high nature value wood pasture system. Now, they live on a farm in the wood pasture and keep only traditional breeds for the Carpathian-basin. Our aim was to summarize their best practices of the renewing an abandoned, shrubby area for high nature and cultural value wood pastures.

The establishment of a pasture in an overgrown shrubs and trees will be continued by clearing. This can be done in several ways. According to the experiences of Tibor Nagy (the owner-farmer of the

studied farm) for shrubs lower than 3 m this can be accomplished by a forestry-type rough bush hog rotary cutter, while older stands are best removed by hand. Cut woody plants need to be removed from the area, as the area of understorey grass, which starts to decay, is overgrown with weeds. Bush hogging after clearing is absolute necessary before livestock is let on the land for grazing, because remaining stumps may result in injuries. Wherever shrubs are not too many, sanitary rotary cutting might be sufficient. Cattle are good for cleared areas and less sensitive to injuries, therefore grazing is best started with cattle in a freshly cleared area (provided you have a mixed livestock of multiple species). During the setup mosaic like patterns should be preferred in all cases, to create a variety of habitats and biotopes. Ideally, both free standing trees and woodlots can be found in the same site. A good wood pasture should consist of three structural units:

1. woodlot (5-40% canopy cover),
2. afforestation for shelter functions (30-50% canopy cover),
3. grassland (maximum 5% canopy cover). Leaving shrubs intact with up to 10% coverage where properly justified.

Trees and forest provide shelter to livestock from cold, hot and other extreme weather, as well as offering forage depending on the species. This is why it is very important to know which individual species should be maintained when a wood pasture is developed. Environmental conditions and natural vegetation cover would be an initial benchmark so that with a competent understanding the desired trees can be selected and left standing.

If the site is treeless, the quality of the habitat can be vastly improved by planting trees. There should be a combination of planting slow growing but long lasting species (such as oak and beech) and fast growing, but shorter lived species e.g. field maple and small-leaved linden. Forest fruit trees are important components of the wood pastures and are commonly found in former pastures as they can provide shade, forage and food to stock and man alike. Hence if wild pear, wild apple, sweet chestnut or other types of fruit trees grow on the site, those trees should be left untouched. It is recommended that only native tree species are planted and/or left standing. Planted or – during bush clearing – spared trees need to be protected from game and grazing livestock. The former can be kept away by fencing, the latter parried by leaving thorny bushes around the tree. If not enough shrubs have grown around the tree, then cut thorny bushes can be placed around the tree in a thicket to prevent the entry of animals. Other recommendations include the protection of the soil while clearing bushes, planning the route of the machine beforehand carefully, and selecting the type of rotary cutter or bush hog you want to use. Tibor Nagy reports more favorable experiences with the chain cutter because it damages the turf less. Working operations should be undertaken in off growing seasons with due consideration given to the nesting and hatching period of birds. An agroforestry system established in this way can integrate grassland management, livestock husbandry and forestry over the long-term.

4.2.2 Renewing an ancient wood pastures with tree planting

The second site is the Kasztó Ancient Wood Pasture, near Bogyiszló village, Tolna county. It was the community pastureland of Bogyiszló village. The extent of the pasture has been larger than it is now when it is managed by a local agricultural company (the Bogyiszló Production and Sales Cooperative). The greatest part of the pastureland is grazed by sheep; other parts are grazed by cattle. The pastureland is a parkland habitat type with large, ancient oak and pear trees without

significant shrub layer. The regeneration of the oak trees is currently unsuccessful. Local people visit the area and some of them collect wild pears for eating and making brandy.

Our aim was to discover the best methods for tree regenerations. We planted 27 oak (*Quercus robur*) and 9 wild pear (*Pyrus pyraster*) seedlings in three groups. In the first group each seedling was protected by shrubs, in the second it was protected by plastic tube and in the third it was not protected. Unfortunately our experiment was destroyed during winter time by game and in the spring by the hay-cutting machine. But it highlights two important issues: one is the high number of game that can damage young trees in agroforestry systems. The second issue is the importance with all related stakeholders as in this case with the driver of the hay-cutting machine.

Based on the landscape historical data and the local people knowledge the main constraint to tree regeneration is the dryness of the soil. The area is a former floodplain area. In the 1960-70's the deeper parts (called valley) of the wood pastures were covered sometimes by water from the Danube. After a road reconstruction this "flooding" was eliminated and the area is steadily getting drier. The ancient and large oak trees are suffering from this dryness as well. The results shows that in this case, the sustainability of the agroforestry system requires an understanding of the historical landscape and soil and water regulation.

Figure 3. Planted oak seedlings protected by cut shrubs in the foreground and an ancient wild pear tree in the background at Kasztó wood pasture, Bogyiszló. Photo: A Varga, 2017.

4.3 Increasing awareness of the nature and cultural values of wood pastures

Awareness can be increased through the branding of products and through education. These are considered in turn.

4.3.1 Branding wood pasture products

A framework of the Hungarian wood pasture product database was set up as a first step. The database records product, producer, farming method, type and location of the wood pasture concerned. Data are collected on local product fairs, national agricultural fairs and trade shows, directly from producers or by browsing the internet. Data collected so far concern mostly dairy products, processed meat and live animals, products made from edible wild fruits and plants as well as cultural and touristic services. The number of products made of wool or wood is not significant yet as market-products. Data collection on the occasion of personal encounters allows the transfer of knowledge to producers and farmers, since most of them are not aware of the contents, significance and potentials of the wood pasture and agroforestry systems. Here the experiences and suggestions of experts, farmers and producers about the main products are presented.

Wool and handcrafts

"*The quality of the wool from sheep grazing on wood pastures or in area protected by shelter belts (forest edges) is better than that of the sheep grazed on open areas. Stock kept specifically for wool (Merino and similar) are particularly sensitive to daily temperature fluctuations. The elemental fibres of sheep getting cold in the summer due to the temperature oscillations will become weaker and their growth gets uneven, which increases the rate of tear during processing and subsequent use, in summary the quality of the wool will be impaired. The more homogeneously temperature and relative humidity in the pastures are kept, the better quality wool can be reckoned with. In addition to the mitigation of the daily temperature fluctuations it is also important to provide shade on the pasture. Sheep growing thick wool in the summer may get heat stroke on the dazzling sun, or may get weaker due to overheat and become prone to pathogens, which again will show on wool thickness, homogeneity and elasticity. A daily rhythm developed by the flock itself alternating between shady and sun beaten areas (provided the stock is taken care of in other respects) may result in ideal quality wool.*" Csaba Molnár, Gubanc Wool Manufacture, http://www.gubancgyapju.hu/

Meat

According to the opinion of Sonka, i.e. ham master László Árpás the quality of a ham is determined in at least or may be in more than 50% by fodder. The excellent quality of world famous Spanish ham is also ensured by the masting and grazing of the pigs. In Hungary, there would also be a potential to prepare premium grade ham like the Spanish ones and demand would be there. Only pigs fastened on acorns are missing. www.sonkamester.hu

Wild fruit and edible plants

"*Nearly twice as many herbs and edible wild plants live on meadows and grasslands than on all the other habitats, and if you add edible and medicinal species of trees and shrubs on pasture land, you can clearly state that from the perspective of medicinal herbs and edible plants the best sources are represented by wood pastures, or gallery forests chequered with grasses, meadows. In the case of most species which can be used as nutrients or medicinal herbs the habitat cannot be replaced by*

artificial farming, or, if yes, the wild variant is still valued higher for several properties. Actually grazed wood pastures and gallery forests are again of outstanding value for their production of mushrooms. Grazing, manuring, trampling, movement of the animal and the lower rising grass are all beneficial factors for the sustenance and propagation of several mushroom species. Trees are also important for fungi living in association with roots and living on trees as pathogens as well as for saprophytes, besides gallery type tree stands contribute in the maintenance of the humid microclimate fungi prefer." Andrea Dénes[4], botanist and an expert on edible wild plants,

More information on Váczakő Farm, Dudar can be found through their facebook page (https://www.facebook.com/vaczakomajor/?fref=ts). The Gastro television show, Gastro Angel (Gasztroangyal) also examined the wild fruits and meat obtained from wood pastures: https://www.youtube.com/watch?v=OVeBEYc3tdk&t=900s

Tourism

"*Wood pastures could be one of the most precious landscape value of the Mecsek region. However, there is hardly any left be now, only one or two remnants, protected as a sightseeing feature for tourists is left. They are in very poor shape due to lack of maintenance (grazing is missing). There would be a great need to renew this type of forest, since it was formed on the basis of the 'ecological lessons' from the distant past. Touring Transylvania you can still see a number of pasture forests many places, which offer a unique sight in terms of landscape beauty. Their renovation is recommended not only from the perspective of economic and ecological benefits, but also to conserve landscape diversity and touristic utilisation.*" Gábor Máté, ethnographer and rural landscape researcher

Figure 4. Former abandoned wood pasture, today is a wild pear dominated wood pasture at the Váczakő Major, Dudar. Photo: A Varga 2016.

[4] erdokostolo.blogspot. hu

Figure 5. Wild pear and wild apple products (vinegar, jam and syrup) from Váczakő Farm, Dudar. Photo: A Varga, 2016

Figure 6. The regional tourist map is highlights an ancient wood pastures (Kasztó wood pasture, Bogyiszló) Photo: A Varga A, 2015

4.3.2 Increasing awareness with education

Relations between wood pastures and local children, farmers, herders and conservation rangers and their knowledge were revealed in semi-structured and structured interviews. Wood pastures up to the 1990s were typically used by the community and livestock were grazed by shepherds. Conversely, the most current features include private ownership and grazing using electric fences. In the last 20 years the attitude of nature conservation officials towards wood pasture management has grown into an intense interest and consequently traditional ecological knowledge and the world of herders are now held in higher esteem. A key to wood pasture preservation is the support given to land users working on them through policy and funding. Additionally, recognition of the values

inherent in a wood pasture by the public is an important factor. One of the approaches to this is the consumption of wood pasture grown produces, another is the incorporation of wood pastures in the curricula in public education, both representing a revival of the once prevailing connections. In the second part of the 20th century children still generally visited local wood pastures with family members which practice was dropped as they were abandoned or privatised. This role is taken over more and more by the schools (see the case study of Bogyiszló). The revitalisation of the connections between wood pastures and people is important not only for the purposes of preserving the values prevalent in the wood pastures, but also to conserve the biocultural diversity of the European wooded landscapes.

Figure 7. Visiting the local herder during a school day and learning the values of the wood pastures on field. Photo: Bogyiszló, A. Varga 2017.

"Kasztó-projekt" - Case study with the local

During the 2016-2017 academic year, in Bogyiszló (the second field site of the work-package 2 stakeholder group in Hungary), in the framework of the AGFORWARD project, we began to outline methodological principles for the incorporation of wood pastures and ancient trees into school work. In the course of this work, the teachers and pupils of the Bogyiszló Primary School and Anna Varga, as a researcher, have cooperated to develop a guide for school and popular educational purposes. This guide enables pupils to get familiar with a wood pasture in the vicinity of the village, by performing independent research tasks: exploring traditional knowledge on nature, landscape history, and ecology, collecting and analysing the data, and presenting the results (Table 1). The novelty of the project lies not only in its subject, but also in the fact that local, traditional knowledge on nature and ecology enters formal education, in much the same way as folk songs are sung in music classes.

Table 1. Summary of the "Integration of wood pasture, herders and ancient trees topics in formal education at the local primary school".

Grade - topic - subject	Tasks to get involved
Grade 3 Literature – library usage Grammar – a lexicon of local plants and animals name	**Books - trees – shepherds – tales** Wood pastures, old trees and shepherds in tales During a lesson held at the library, looking up the words in lexicons, perusing books to find tales with shepherds, old trees or pasturing
	Conducting a survey among adults about plant and animal names, with a pictured questionnaire.
Grade 4 Music, dancing, Heritage conservation Herders and pastures	**Music -Songs - herders' life and knowledge** 1. In music class, learning and discussing a song from Bogyiszló, about pastures and shepherds 2. Visiting a local shepherd, talking about his work 3. Looking up songs about shepherds and pastures from music textbooks
Grade 5 History, wood pastures, Kasztó	**Landscape history and Kasztó** 1. Internet search about the history and the present state of wood pastures 2. Interviewing elderly inhabitants of Bogyiszló about the Kasztó (Grade 7 pupils are experts in this field)
Grade 6 Science – Biology, detailed assessment of the trees of the Kasztó	**Ancient oak trees** With datasheets for giant trees, measuring all the large trees of the pasture.
Grade 7 Geography, Sports Sketching maps Following the footsteps of shepherds and fishermen	Walking by the map Collecting old data about the Kasztó, how it all used to be. Dialogues with the elderly, at their homes or in the field. Assorting a collection and notes at home.
Grade 8 Maths – Chemistry - Physics	**Wood pasture in numbers** 1. Maths: calculations with the data collected by Grade 6 2.Physics: research in the field – comparing the microclimate under canopy and in the open 3. Chemistry: Kasztó, wood pastures and the kitchen
Every grade: Orienteering Sports – Cartography	**Think and search at the field** Practical task in the field
Mechanical arts for the boys	**Model of the wood pasture** Construction of a landscape layout with the help of maintainer Lajos Kiss

Figure 8. Ancient trees, herders and wood pastures in the class room. Each class had a tree and the children wrote the messages on the “leaf” of their class tree about the environments, the data of the wood pastures and knowledge what their gathered during their research work. Photo: A. Varga, 2017.

Today, it is generally acknowledged that effective nature conservation can best be attained with the cooperation of local people, and by considering the local, traditional ecological knowledge. Our work aims at enabling future generations to preserve this intellectual natural heritage. During the Kasztó Project day, we are sharing the results of our work. The project day was on the 10th of May, the Day of Birds and Trees. The children shared with each other their data and stories about the Kasztó, collected throughout the year. We chose this day as in olden times, in several Hungarian villages it was the custom on this day to take the children out to a nearby wood pasture to play, and to get familiar with its natural values.

Besides the school programme, we have also called for the submission of artworks, for a competition with the participation of adults as well as children. At the Kasztó Exhibition besides the submitted works of art, the results of the Kasztó project can also be viewed by the visitors. We plan to publish all the results in a comprehensive writing about the Kasztó, and also to compile a methodological guide, hoping that more schools, teachers, environmental educators, parents, and children may be encouraged to get acquainted with local natural treasures and wood pastures. Video summery of the project - Ancient wood pastures in education https://www.youtube.com/watch?v=tC6bgY6w0mM

5 Main lessons

Experiences and preliminary results from measurements and observations in a high nature and cultural value wood pastures produced the following lessons:

- Based on the ethnographic and historical sources related to wooded-forested pasturing systems it was established that available data describe the practical significance and systematic application of husbandry in detail, but they are not suitable for exact reconstructions. One of the underlying causes is that the use of the terms wood pasture and grazing forest are mixed up, they can only be differentiated with difficulty, and traditional land use operators do not make any distinction between the two concepts.
- The issues related to the preservation of wood pastures were explored both nationally and locally. Key problems were identified as follows: (1) abandonment of traditional land use practices and the resulting encroachment of shrubbery and forests, which partly lead to (2) legal barriers and policy issues (prohibition of forest grazing), (3) lack of herders holding the necessary knowledge, and (4) disregarding the local landscape and habitat specific conditions in the regulations associated with agrarian subsidies.
- Concerning to the establishment or renew a wood pasture, it is not possible to apply the same management template for all wood pasture designs. Before the implementation of regeneration projects it is important to understand the history of land management, and to acquire sound knowledge of environmental and climatic conditions. The local and traditional ecological knowledge of the related landscape and management could enhance the high nature and cultural value farming as well.
- Role of gastronomy: One of the ways of realizing this is to involve the public in consuming products coming from wood pasture, as well as in enjoying food i.e. gastronomy. “It is a universally acknowledged truth that everyone finds it delightful to eat healthy and delicious food”. In the last couple of decades the most serious threat to Hungarian wood pasture has been their abandonment. Recently more farmers have started to restore wood pasture to their high nature and cultural value status. There are many good “gastro” examples of the support farmers can give to high nature and cultural value farming. The main message is that you can contribute to preserving values such as ancient trees of traditional knowledge by consuming wood pasture products. There is a hopeful conviction that any individual’s personal experience of delightful eating creates an awareness of the possibility of taking part in the conservation of biocultural heritage in an active way.
- Rethinking the connections between man and landscape again and again is a perpetual issue of humankind. These days this topic has become a central and key issue for not only nature conservation, but sustainable agriculture and forestry, food sovereignty, education, human health and human well-being as well. The wood pastures could be a kind of bridge to revive this relationship as they have a central role in the local economy, the beauty of the habitat, and the ancient trees and a high level of the local heritage value.

Postscript. From September of 2017, it is possible to graze in forest in non-native and law naturalness forest type with permission. It was not possible to graze in forest from 1961 until 2017. The results of AGFORWARD project and the growing interest of the farmers in agroforestry innovations influenced this decision.

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7 References

Andrásfalvy B (2007): Duna mente népének ártéri gazdálkodása. [Floodplain management of the people along the Danube river] Ekvilibrium. pp. 438.

Bölöni J, Szmorad F, Varga Z, Kun A, Molnár Zs, Bartha D, Tímár G, Varga A (2011). Egyéb erdők és fás élőhelyek – P 45 – Fáslegelők, fáskaszálók, legelőerdők, gesztenyeligetek [Wood pastures, wooded meadows, grazed forest and chestnut orchards] In: Bölöni J., Molnár Zs., Kun A. (szerk.): Magyarország élőhelyei – Vegetációtípusok leírása és határozója ÁNÉR 2011. MTA ÖBKI, Vácrátót, pp. 359−362.

Bölöni J, Molnár ZS, Biró M, Horváth F (2008). Distribution of the (semi-) natural habitats in Hungary II. Woodlands and shrublands. – Acta Botanica Hungarica 50: 107–148.

Paládi-Kovács Attila (ed.) (2001). Magyar Néprajz II. Gazdálkodás [Hungarian Ethnography II., Agriculture] Budapest, Akadémiai Kiadó. p.1170

Plieninger T, Hartel T, Martín-López B, Beaufoy G, Bergmeier E, Kirby K, Montero MJ, Moreno, G., Oteros-Rozas E, van Uytvanck J (2015). Wood-pastures of Europe: Geographic coverage, social–ecological values, conservation management, and policy implications, Biological Conservation, 190: 70–79.

Varga A (2017). Innovation from the Past: Silvopastoral systems in Hungary in the light of Hungarian ethnographic literature. Acta Ethnographica Hungarica, 62:135-162.

Varga A, Ódor P, Molnár ZS, Bölöni J (2015). The history and natural regeneration of a secondary oak-beech woodland on a former wood-pasture in Hungary. Acta Societatis Botanicorum Poloniae, 84: 215-225.

Varga A & Molnar ZS (2014). The role of traditional ecological knowledge in managing wood-pastures. In: Hartel T, Plieninger T (Eds) European wood-pastures in transition: A social-ecological approach. Earthscan from Routledge, Taylor & Francis Group, London–New York. pp. 187–202.

Varga A, Molnár Zs, Biró M, Demeter L, Gellény K, Miókovics E, Molnár Á, Molnár K, Ujházy N, Ulicsni V & Babai D (2016). Changing year-round habitat use of extensively grazing cattle, sheep and pigs in East-Central Europe between 1940 and 2014: Consequences for conservation and policy. Agriculture Ecosystems & Environment 234: 142-153.

Vityi A, Varga A (2014). Initial Stakeholder Meeting Report Wood pasture in Hungary. AGFORWARD, https://agforward.eu/index.php/hu/fas-legelok-magyarorszagon.html

Vityi A, Varga A (2015a). Research and Development Protocol for the Wood Pastures in Hungary. AGFORWARD, https://agforward.eu/index.php/hu/fas-legelok-magyarorszagon.html

Vityi A, Varga A (2015b). System Report: Wood Pasture in Hungary. AGFORWARD, https://agforward.eu/index.php/hu/fas-legelok-magyarorszagon.html