

Book of poster abstracts

Wild Forest Products in Europe

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The 'Salep' traders of Pindos mountains in Greece

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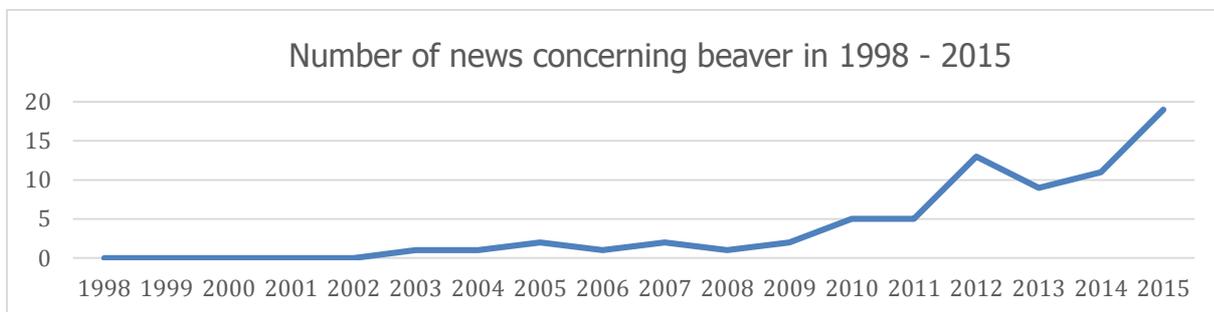
'Salep', is the principal component for the preparation of a hot beverage made from the tubers of the orchid genus *Orchis* which is also used for medicinal reasons in the villages of Pindos mountain range. In some villages a small local scale trade, although illegal according to the Greek forestry law, existed in the near past. High prices were giving the opportunity to specialized collectors to work for a period of 2-3 months in early summer and earn sufficient money for the needs of the other half of the year. Traditionally, those collectors were living for a period in the countryside, in the vicinity of their villages or in shepherd's huts and (as no road network existed) they had to move and to transport their harvest using mules or donkeys. All mountain grasslands above tree line (including wet grasslands) were "managed" by the collectors who knew the best time to collect the best quality and to ensure sustainable use by carefully replanting the orchids after harvesting. Drying of the tubers was done in the village backyards, while the trade was taking place in the nearby town. Nowadays the trade is still active, but more people are involved and fewer quantities correspond to family groups of collectors. Moreover, a network of new forest roads gives the opportunity of rapid accessibility on former remote areas and local traders compete to take the plant tubes first. Accordingly, our preliminary survey indicates a local decline in the abundance of orchids. Greek Forest Law prohibits trade and collection of all orchid species, but it cannot combat black marked. In general modern demand and increasing popularity of "wild and traditional" food threats orchids. However past sustainable collection should be tested in accordance to local harvesting rights that have to be enforced in order to prevent overexploitation.



The beaver paradox - Protected species, which might not need protection anymore?

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Natura 2000 is a direct response to the needs and concerns of the EU over the loss of habitats and biodiversity. One of basic principles of management of Natura 2000 sites is not just involvement of landowners, but to some extent also of the public. The public thus needs to understand that people are a part of nature and that sustainable management is a key aspect of nature conservation. Hunting is not highly acceptable among people, especially those living in cities and this can be disturbing to a part of society, which is concerned with the possibility of overhunting. Due to excessive hunting and habitat loss some species, such as beaver (*Castor fiber* L.), were brought to the brink of extinction. In areas where there are viable populations sustainable hunting is now recommended in order to manage the beaver. The last beaver in Slovenia was culled in the 18. century but returned back from Croatia in 1998. The population is increasing in numbers and damages are already being reported. Slovenia does not have a strategy for beaver management yet and consequently no related communication strategy. To avoid conflicts due to lack of knowledge, the public needs to understand why there is a change of an attitude towards the beaver as from a protected to a hunting species. The media are a source of information and therefore, a strong factor in shaping public opinion. We examined the web news, local and national newspapers and TV segments addressing beaver published in 1998–2015 using qualitative content analysis. In order to identify the prevailing tendencies in the media, we divided reporting in three categories. Our results show increasing trend in the number of contributions on beaver related topics with prevailing impartial information of no clear message addressing public opinion on the above-mentioned topic.



Number of news concerning beaver in 1998–2015.



Beyond wood: the state of non-wood forest products in Mediterranean Europe

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Wild non-wood forest products (NWFPs), such as mushrooms, berries, aromatic, medicinal and decorative plants, fruits, cork, chestnuts, etc. have always constituted an important part of the total economic value of forests. The latest report on the state of Europe's forests (Forest Europe 2011), reported that the total value of NWFP in the Forest Europe region was estimated at 2,763 million Euro, of which 83% was generated by plant products. The value represents around 10% of the value of roundwood, which is significant considering the deficiencies in data collection and missing NWFP.

NWFPs are especially significant in the Mediterranean region, where an immense diversity of NWFP combines with low profitability of wood such that NWFPs represent a considerable part of the value of total forest production. In the Mediterranean region, according to the estimates of Croitoru (2007), NWFPs provide annual benefits of about €39/ha, accounting for about a fourth of the total economic value of forests estimated by this study.

Unlocking the full potential of NWFP requires new knowledge and tools to optimise the sustainable provision and profitability of NWFP, better understanding on the potentials of markets for NWFP and of the role of innovation processes for new products and services. These are some of the goals of the EU 7FP project, StarTree. The project includes 24 partners from 12 countries and it is focused around research in 14 case study regions across Europe. Six case studies are located in the Mediterranean Europe: Alentejo (Portugal), Bursa (Turkey), Catalonia (Spain), Trentino-Alto Adige (Italy), Osrednjeslovenska (Slovenia) and Valladolid (Spain). This paper summarizes the results of the regional scale analysis in these six regions to give a consolidated overview of the situation of NWFP in the Mediterranean Europe.



Kernel yield loss in Mediterranean stone pine cones

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Context. *Pinus pinea* L. is economically relevant for the harvest of its cones for extracting the edible Mediterranean pine nuts kernels. But recently, a severe loss of kernel-per-cone yield has been reported by processing industries in all countries from Portugal to Lebanon: in apparently sane cones, up to half of seeds are empty. Additionally, cone pickers have been observing a high percentage of small, unripe conelets aborted in the crowns, reducing the final number of harvested cones. The recent and coincident appearance of both phenomena has coined the common name *Dry Cone Syndrome (DCS)*, suggesting a possible common cause. Only since 2012, awareness has grown about the emergence of *DCS* all over the Mediterranean, after first alarms from Italy ten years ago. *DCS*, if persisting, is a serious threat for commercial pine nut harvesting, an activity essential for the economic sustainability of Mediterranean pine forests and plantations and for the processing industry, a market of several hundred million euros annually.

Methods. In 2014, a first survey of cone processing industries produced a short dataset, which has been updated and enlarged, in order to assess the impact of *DCS* on the pine nut sector in different countries.

Results. Available time series of seed-per-cone yield data from processors are analysed and discussed. Average seed-per-cone weight yield has dropped in the last years from former 15-20% to less than 12%, kernel-per-cone weight yield from 3.5-4.4% to 1.5-3.0%. The reason is an increase in percentage of empty or damaged seeds from formerly less than 10% to 34-50%.

Conclusions. This results, together with published data and verbal reports gathered from colleagues in the FAO/CIHEAM Research Network on Nuts, reflect the spread and prevalence of *DCS* over Mediterranean countries. The observed damages are plainly compatible with damages caused by the exotic invasive seed-feeding bug *Leptoglossus occidentalis*, introduced two decades ago in Italy and spread during the early 21st century all over Europe and the Mediterranean. The prevalent causality of *Leptoglossus* as main biotic agent, however, or possible implications of increasing draughts or phenological shifts due to climatic change, are objects of ongoing research.



Damage assessment in pine nuts from stone pine caused by *Leptoglossus Occidentalis* and pathogenic agents

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A decrease in pine nut yield and cone production from *Pinus pinea* has been observed during the last years throughout the Mediterranean basin: Spain, Italy, Portugal, Turkey and Lebanon. Damages reported are massive abortion of unripened conelets and a high percentage of empty seeds in ripened cones, which has been called Dry Cone Syndrome. Putative causes are drought during cone ripening and biotic agents as the western conifer seed bug, *Leptoglossus occidentalis*. However, so far there are no evidences for a conclusive agent causing these losses. In order to characterize agents causing pine-nut yield reduction, an experiment was set up in Madrid (Spain) in 2015 in plots where *L. occidentalis* is present. In March, mesh bags were placed covering cones before cone ripening, and in October bags were removed to compare damage in exposed and covered cones. In total, 77 cones from 17 trees were assessed, 35 covered and 42 exposed cones, from which 343 and 419 seeds were evaluated, respectively. There were significant differences between exposed and covered cones for mean seed weight per cone but not for number of seeds per cone. Seeds were placed on potato dextrose agar (PDA) after assessing damages, classified in three types according to damage or absence of endosperm and/or embryo. Percentage of healthy seeds was 94.4% from covered cones and 63.4% from exposed ones. Damage type I consisting of endosperm apparently absent and degraded embryo was the only one observed in seeds from covered cones (5.6%) and may be caused by an abiotic agent or development failures. No culturable pathogenic fungi or bacteria were found, nor galleries or frass attributable to any other cone pest. In absence of any other putative agent, we conclude that *L. occidentalis* must be considered as most likely cause for all types of damage described, including type I, which is indistinguishable from that caused by developmental abortion or abiotic factors.



Consumer perception on wild forest products in South Korea

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In South Korea, a timber-oriented forestry has low profitability due to steep terrain and poor resource status. As a result, many of forest owners opt to grow non-timber forest products in their forestlands such as chestnut, shiitake or pine mushroom, wild vegetables (e.g. *Ligularia fischeri* and *Allium victorialis* etc) and medical herbs (e.g. wild cultivated ginseng, *Hovenia dulcis* and *Codonopsis lanceolata* etc). Some farmers cultivate non-timber forest products in the agricultural land. The production amount of non-timber forest products exceeds that of timber. The objective of this research is to suggest some marketing strategy to promote wild forest products business in South Korea from the consumers' perspective. We conducted internet survey to 640 urban households about the perception of forest products grown or collected from forests. Consumers purchased forest products for their nutrition, medical function, and safety and regarded them as having higher quality than crops cultivated from agricultural land. Consumers preferred wild forest products but revealed no difference in recognition of naturally grown products. Consumers buying forest products prioritize the quality and medical function among attributes. Among consumers as their income increases, they regard growing site more important than price and freshness. Some respondents show the strong distrust of the origin whether the forest products are really grown from forests. Consumers having experience to participate in green tourism like collecting wild forest products show higher preference to wild forest products than others. In conclusion, to promote wild forest products business in South Korea, certification for naturally-grown products to win the consumers' trust and creation of integrated business by combining production, processing and green tourism program must be considered.



Current status of forest farming in South Korea

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Most Southern Korean Forests are located in steep mountain area and are dominated by young aged forests (between 30 and 40). Under this condition, timber-oriented forest industry are not profitable because of high costs in logging and extracting. To alleviate this problems, agroforestry scheme might be one of the possible solutions. In S. Korea, the most popular type of agroforestry is forest farming which means cultivating high valued specialty crops under forest canopy including wild ginseng, wild vegetables (*Ligularia fischeri*, *Pteridium* spp), and medicinal herb (*Codonopsis lanceolata*, *Platycodon grandiflorus*). The specialty crops play crucial role in proving extra income to rural people living near forest. The objectives of this study are to evaluate the management condition of forest farming and find several policy inferences related to forest farming issues in S. Korea. Face to face survey was conducted to evaluate management condition of forest farming, crop production and sales, and impact of governmental subsidies on forest farming. A sample of 64 farmers was selected for the survey. From the results, we find that forest farming business is still at the beginning stage and a lot of farmers are in trouble to manage their business. However, 54.9% of respondents consider that their business are profitable and 73.8% of respondents plan to expand their business scale. Forest farmers are tend to directly contact final customers for sale their products. This allows forest farmers to escape competition with agricultural farmers. Generally, respondents consider the forest farming is more environmental friendly and having a lot of potential than traditional farming. Survey results also show that they are having difficulty in gathering fund and labor sources. Thus, appropriate policies including governmental subsidies, deregulation on uses of forests, and simplifying administrative procedures should be adapted to moderate these problems.



A study on shiitake market in South Korea

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Shiitake, *Lentinula edodes*, is an edible fungus, which grows onto the decaying wood of deciduous trees. Shiitake is mainly produced and consumed in Asian countries, so most information related to Shiitake is barely known to other parts of the world. To date, the amount of production and consumption of shiitake has been increasing. This is attributed to the fact that shiitake is a medicinal fungus and a high value product. While the rapid expansion of shiitake market happens in South Korea as well, the details are unknown due to its small market share in the world. Departing from this background, this study is to investigate shiitake market in South Korea, which includes production, consumption, trade, and consumer preference for shiitake. To analyze shiitake market of South Korea, the study utilized statistic data from Korea Forest Agency in 1996-2015, and estimated the value of market in 2016 through KREI-KASMO model. Also, the study surveyed 500 consumers. As a result, the amount of production is 26,000 tons in 2015. The amount of Shiitake import is 20,000 tons. Consumer survey shows that the most important factor to purchasing shiitake is the price followed by the outward appearances.



Non-Wood Forest Products in European policies and regulations

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The recent emphasis on the role and importance of NWFP requires attention to the institutional framework under which they are regulated and promoted.

The research conducted within the StarTree project in ten European Union (EU) countries and in two neighbouring countries shows that across countries the harvesting of NWFP is regulated with several differences. The provisions contained in the regulations differ in terms of i) “what” is regulated (sometimes NWFP as a general category, sometimes specific products); ii) “who” can collect (everybody versus the owner of the land, resident in the place of collection versus non-resident); iii) “where” it is possible to collect (differences between private and public forests etc.); iv) “when” it is possible to collect (always vs season, daytime); v) “how much” (free collection vs quantity limits); vi) how (by what means); vii) “why (personal use vs commercial purpose); viii) under which requirements (free vs use of permits, quotas, concessions).

The role of NWFP is also recognised at EU level. The study of the texts of the forest policies and processes in which EU is involved shows that the EU looks at NWFP as a component of the social and cultural dimension of sustainable forest management and it encourages the sustainable use of NWFP for “providing and increasing the potential for traditional and new forest products, sales of which can provide, for both the owner and society, a ready means of financing forests” while providing “opportunities to maintain or create jobs and diversify income”.

Although in the EU the formulation of forest policies and regulations (P&R) is the responsibility of each member state, the EU can influence the national policies through common processes. The study in the national case-studies shows that this coordination is detectable since the great majority of forest P&R developed after the publication of the EU Forest Strategy include a reference- sometimes general, sometimes more detailed - to NWFP.

The StarTree researches also show that not only harvesting rights and forest P&R have an impact on the NWFP sector. This is especially true when we refer to NWFP as products that move from the forest into a value chain. Due to the diversity of NWFP, the variety of production system/management and the NWFP uses, a complex institutional framework is involved. This interests several stakeholders (forest owners, producers, processors, traders, consumers, civil society and policy makers), at multiple scales (international, communitarian, national, subnational) and it embraces multiple policy sectors, namely rural development, nature conservation, trade and tax system, product safety regulations, food and product standards. Therefore, policies aiming at promoting the NWFP sector require a comprehensive and coordinated vision.



Wild, non-wood, non-timber forest products – optimization of definition for sustainable use and development

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Analysis of forest policy frameworks relevant for non wood forest products (NWFPs) in Latin America, Eastern Europe and Central Asia showed that there is no standardized approach to the definition and classification of NWFPs. The Food and Agriculture Organization of the United Nations (FAO) defines Non-wood Forest Products (NWFPs) as being “goods of biological origin other than wood derived from forests, other wooded land and trees outside forests”. This definition is used as reference for formal statistical reporting. If the national policy documents there is a wide diversity of classifications and references to non wood forest products: secondary products and uses, minor, wild or non-timber forest products (NTFP). NWFPs may be gathered from the wild, or produced in forest plantations, agroforestry schemes and from trees outside forests. From their economic importance, policy and normative documents classify the NWFPs as used as food and food additives (edible nuts, mushrooms, fruits, herbs, spices and condiments, aromatic plants, game), fibers (used in construction, furniture, clothing or utensils), resins, gums, and plant and animal products used for medicinal, cosmetic, decorative or cultural/spiritual purposes. Where definitions remain broad and inclusive their interpretation may as well be applied to ecological services, and therefore is linked with an immense environmental value. NWFPs have the potential to address such challenges as: hunger alleviation and food security, support of rural livelihoods and rural development, as well as contribute to the climate change mitigation and resilience. An updated approach to definition and classification of non wood forest products fully reflecting their potential for social, economic and ecological benefits would facilitate the definition of policy measures supportive to their better use. The potential of NWFPs could be better aligned with national strategic objectives in reaching and implementing programs in support of the achievement of the broader Sustainable Development Goals (SDGs) and initiatives to achieve the 2030 Agenda.



Policy frameworks to enhancing the role of non-wood forest products (NWFPs) for achieving SDGs

Anastasiia Kraskovska, **Jorge Benitez** and Irina Kouplevatskaya-Buttoud
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Policy Frameworks and Decisions are instruments designed to cope with challenges. Formal policy documents relevant for non wood forest products were analysed in Eastern Europe and Central Asia, and Latin America and the Caribbean in order to select regional case-studies for existing country-level Policy Decision & Framework analysis on the topic of Non-wood Forest Products (NWFPs). Lack of common definition on NWFPs pose a major challenge for international, regional organizations and governments alike dealing on matters of value chains, market-access, trade and data-collection. The implications of NWFPs being properly considered into gross domestic product (GDP) calculation could potentially upgrade countries into different income-groups as classified by the World Bank (WB). NWFPs are an ideal focus for sustainable economic development, having the viability of driving reduction of inequalities, climate change mitigation and rural empowerment. NWFPs have a major socio-economic potential for both regions, considering their total forest area, populations living under poverty, and ecological impact. Focus on NWFPs for national development plans, strategies and programs may address international commitments to the United Nations (UN) Sustainable Development Goals (SDGs), 2030 Agenda. NWFPs are characterized by their cross-sectoral impact-potential. SDG1 No Poverty, SDG2 Zero Hunger, and SDG10 Reduced Inequalities are the predominant challenge for both regions. By focusing on edible NWFPs (fruits, nuts, berries, etc.) countries could implement programs targeting the vulnerable and those most in need which inevitably are the indigenous and rural communities that are wide-spread in both regions. SDG12 Responsible Consumption and Production and SDG13 Climate Action are present in the rhetoric of sustainable resource management. All SDGs are relatable to the NWFPs, but it is through SDG17 Partnerships between private and public interests where the true potential exists.



Developing empirical models for predicting production of bay leaves (*Laurus nobilis*)

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Laurus nobilis is one of the most important Non-Wood Forest products (NWFPs) in Turkey and grows mainly on coastal part of the Aegean, Mediterranean and Black Sea regions. *Laurus*, its leaves and seeds are used as NWFP, has been widely utilized in food, medicine and cosmetic industries over many years. Turkey is one of the most important bay leave suppliers in the world. For example, in 2014 Turkey exported about 12 million kg bay leaves with worth 36 million \$ (TUIK, 2015).

Existence of a number of serious bay leave markets in the world compels to take these products into account in developing forest management plans based on the principle of sustainable and multiple use concept. Therefore the inventory of this product and identifying the relationships between bay leaves production and some environmental factors are primary steps in integrated forest management. In fact, developing empirical yield models to estimate the productivity of Bay leaves is necessary in multiple use forest management planning.

This research presents both inventory design for data collection and estimated productivity models of Bay leaves in Yeniköy planning unit, Turkey. For this purpose, 35 sample plots were established in the understory vegetation and 2 cohorts from each sample plots were sampled. Total green leaf sprout of bay was cut and weighed for fresh weight in the 70 sample cohorts. In the meantime, the percent crown coverage and abundance of bay leaves are also measured based on Braun-Blanquet method. In addition, the other necessary measurements such as the number of cohorts/ha, distances to all adjacent cohorts, number of individuals in a cohort, diameters of stems and ages of dominant individuals in a cohort, width of cohort crown, height of cohort crown and the site condition were also taken in each sample plot. The statistical relationships between the “the amount of green leaf sprout” and environmental parameters were analyzed with regression analysis. The productivity models provide opportunities in developing multiple use forest management plans with decision support systems.



Analysis of the potential of NWFPs for forest owners – a case study comparison

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Ecosystem-based forest management approaches that foster the sustainable use of a broad portfolio of forest ecosystem services are gaining momentum recently. Utilizing the whole palette of forest products and services is expected to positively contribute to contemporary global challenges like the mitigation of climate change, poverty reduction, or improving food security. Non-wood forest products (NWFPs) can make a contribution to unlock latent additional potentials of forestry production chains and provide income to numerous forest owners who are willing to invest in related businesses. Given the current state of knowledge regarding NWFPs in Europe, expert based approaches can be understood as valuable concepts to unravel both socio-economic and ecological dimensions of natural resource planning. In order to contribute to the development of an applicable decision support tool tailored towards extension service providers who give advice to forest owners we replicate an expert model approach designed to foster the sustainable use of forest resources in different environmental conditions. Based on a harmonized approach for stakeholder participation we analyze the multiple dimensions of selected NWFPs at various spatial and temporal scales and investigate experts' opinions with regard to their performance within the non-wood forest sector.

In this contribution we aim to pinpoint the diverse range of opportunities NWFPs can offer to different types of forest owners who are willing to invest in the joint management of wood and non-wood resources. We discuss economic, social as well as ecological potentials in selected case study regions in different biogeographical zones covering the three major biomes in Europe (i.e. Alentejo, Catalonia, Extremadura, North-Karelia, Styria). Mushrooms and truffles constitute the most widespread NWFPs category. However, their individual potential for forest owners differs substantially among regions. Investigated NWFPs options indicate that multiplicity is prevailing among biomes and this holds true for ecological as well as for socio-economic capacities.

