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PLANT WILD GRUNDTVIG PROJECT

3rd meeting report

Sustainable wild harvesting - State of the art & needs on training

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Nature Research Centre Institute of Botany
Vilnius (Lithuania)

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Objective

The specific objective of the 3rd meeting of the PLANT WILD Grundtvig project was to determine the overall state of the art of wild harvesting of plant resources in each partner country (Lithuania, Portugal, Spain and Turkey), from production to training activities, in order to detect the implementation level of sustainability issues and identify needs on future training for increasing it.

Methodology

Before the 3rd meeting was held, a template was prepared by each partner, in order to gather information on the following topics:

1. State of the art of wild harvesting, for commercial and non-commercial use:
 - a. Commercial: species, collected part, annual volumes, conservation status, legal protection, production process, collection method, existing studies and guidelines, existing initiatives for plant population monitoring and existing measures for improving sustainability of wild harvesting.
 - b. Non-commercial: species, collected part, importance, conservation status, legal protection, collection method, existing studies and guidelines, existing initiatives for plant population monitoring and existing measures for improving sustainability of wild harvesting.
2. Legal framework regarding wild harvesting: list and brief description of regulations (at international, national and regional scale), affected species, control system, adoption by collectors and reasons why the rule is adopted or not by collectors.
3. Guidelines and certification: list and brief description of current guidance and certification rules that are applied in wild harvesting activities affected species, control system, adoption by collectors and reasons why the rule is adopted or not by collectors.
4. Sustainable wild harvesting training:
 - a. Existing training during the last 5 years and only related to sustainable wild harvesting.
 - b. Needs on training: in order to determine needs on training for improve the sustainability of wild harvesting, a questionnaire was completed by each partner with the following questions:
 - i. Which are the target stakeholders to be trained in order to really implement SWH?
 - ii. How should be the training to reach these stakeholders?
 - iii. In your opinion, which stakeholders are the most interested in promoting SWH?
 - iv. And in learning about SWH?
 - v. Which are the main factors affecting the SWH implementation?
 - vi. Is your organization interested in doing adult training on SWH in the future?



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Results

Commercial and non-commercial wild harvesting

Lithuania

Over 100 medicinal plant species, 380 edible mushrooms species and 20 plant species with edible fruits and berries grow in Lithuanian forests.

Most of these species are gathered for satisfying personal needs, especially in case of medicinal plant species.

Only 20-30 % of mushrooms and berries are intended for sale. The income coming from these NWFP make up 13% of the total amount earned from forest activities and are very important in forest areas of the S and SE of Lithuania.

Mushrooms are the most important NWFP in Lithuania. From 1997 to 2010, an average of 1352 tones of mushrooms, mostly chanterelles (79%) and boletus were sold for processing annually. Their export has increased considerably.

Berries are also important in Lithuania, with around 1500 tones in 2010, mostly bilberry (*Vaccinium myrtillus*).

Regarding medicinal plants, commercial amounts of MAP raw material continuously decreased from the late 90's, with 80-90 t/year, to around 20 t in 2010. The most demanded species in the period 2005-2009 were *Rubus idaeus*, *Urtica dioica*, *Arctostaphylos uva-ursi*, *Thymus* sp., *Hypericum perforatum*, *Cetraria islandica*, *Artemisia absinthium* and *Menyanthes trifoliata*.

Table 1 shows the most commonly collected MAP species for non-commercial purposes. Harvesting rates and return periods are established by law in Lithuania. Some of the traditionally collected species are protected and they must not be gathered at all. However, every year some of them are still collected (e.g. leaves of *Allium ursinum*).

Table 1. MAP species collected in Lithuania for non-commercial purposes.

Species	Collected part	Return period & harvesting rate	Collecting method
<i>Thymus pulegioides</i>	above-ground part	every year, < 50 %	cutting of above-ground part
<i>Thymus serpyllum</i>		every year, < 50 %	cutting of above-ground part
<i>Hypericum perforatum</i>		every year, < 50 %	cutting of inflorescences with leaves
<i>Origanum vulgare</i>		every year, < 50 %	cutting of inflorescences with leaves
<i>Cetraria islandica</i>		no data	collecting all body of lichen



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Species	Collected part	Return period & harvesting rate	Collecting method
<i>Lycopodium clavatum</i>		every year, < 50 %	cutting strobili
<i>Convallaria majalis</i>		every year, < 50 %	cutting of above-ground part, every year, < 50 %
<i>Centaureum erythraea</i>		not reported	uprooting all plant
<i>Rubus idaeus</i>		every year, < 50 %	cutting of sprays, picking of leaves
<i>Artemisia absinthium</i>		every year, < 50 %	cutting of above-ground part
<i>Fragaria vesca</i>	leaves	every year, < 50 %	picking of leaves
<i>Chamerion angustifolium</i>		every year, < 50 %	picking of leaves
<i>Allium ursinum</i>		Harvesting is forbidden	leaves are picked in some populations every year
<i>Tilia cordata</i>		flowers	every year, < 50 %
<i>Filipendula ulmaria</i>	every year, < 50 %		cutting of inflorescences with leaves
<i>Sambucus nigra</i>	every year, < 50 %		picking of inflorescences
<i>Carum carvi</i>	fruits	every year, < 50 %	uprooting all plant with not finally mature fruits
<i>Potentilla erecta</i>	rhizome	every 6 years, < 30 %	digging of rhizomes

Portugal

In Portugal volumes of wild harvested MAP species for commercial purposes are not registered annually. However a study carried out in 2010, recorded the annual volume for the most marketed species, which was around 97 t of dried raw material all together (Table 2).

The most collected wild species for commercial purposes in 2010 were *Eucalyptus globulus* and *Pinus pinaster* (48.3 t of dried leaves and 30 t dried buds and needles, respectively). Other important commercial MAPs were *Cistus ladanifer*, *Equisetum telmanteia*, *Pterospartum tridentatum* and *Centaureum erythraea*, with more than 1 t of dried raw material per year (Table 2).



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Table 2. Most collected MAP species in Portugal for commercial purposes. Volumes 2010.

Species	Collected part	Annual volume (kg dried weight)
<i>Eucalyptus globulus</i>	Leaves	48.300
<i>Pinus pinaster</i>	Buds, needles (leaves)	30.000
<i>Cistus ladanifer</i>	Flowering shoots	7.500
<i>Equisetum telmateia</i>	Sterile stems	4.450
<i>Pterospartum tridentatum</i>	Flowering shoots, flowers	3.300
<i>Centaureum erythraea</i>	Flowering shoots	1.070
<i>Tilia platyphyllos</i>	Inflorescences, inner bark	850
<i>Fraxinus angustifolia</i>	Leaves, sometimes bark	420
<i>Matricaria recutita</i>	Flower heads	405
<i>Malva sylvestris</i>	Leaves and flowers	310
<i>Sambucus nigra</i>	Flowers, sometimes fruits and bark	195
<i>Chamaemelum nobile</i>	Flower heads	90
TOTAL		96.890

In some cases, wild harvesting is associated to the timber production (leaves of *Eucalyptus globulus* come from cut branches for timber) or even to preventive measures for reducing fire risk (flowering shoots of *Pterospartum tridentatum*).

Cistus ladanifer ssp. *sulcatus* is protected by law in Odemira and the biogenetic reserve of Sagres (Alentejo, SW Portugal), so measures for assuring sustainability of wild collection of the flowering shoots have been proposed. It is unknown if these measures have been adopted by collectors.

The harvesting is carried out by individual or collective collectors, who usually sold the fresh material to companies or individual producers in order to process it (distillation or drying, packaging and storing). When appropriately processed, the raw material is sold to marketing companies or wholesalers for distribution.

Regarding the non-commercial species, Table 3 shows the most collected ones. Only 6 of these species are considered threatened and managed somehow. Some examples:

- *Vaccinium myrtillus* is considered vulnerable but actually its conservation status is still unknown. In the National Park of Peneda Gerês (NW Portugal) a harvesting quota is established annually, according to the vegetative development of the species on that year.



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- *Thymus caespititius* is considered vulnerable but actually its conservation status is still unknown.
- *Ilex aquifolium*, *Arnica montana*, *Gentiana lutea* are protected and harvesting is forbidden.
- *Prunus lusitanica* ssp. *azorica* is protected in specific conservation reserves, where wild harvesting is forbidden.

Table 3. MAP species collected in Portugal for non-commercial purposes.

Species	Collected part	Collection method
<i>Asparagus acutifolius</i>	Young shoots	Cutting the young shoots
<i>Ilex aquifolium</i>	Leaves and berries	The leaves and berries are used for ornamental purposes during Christmas
<i>Melilotis melissophyllum</i>	Shoots, leaves and seeds	Cutting the aerial part
<i>Prunus lusitanica</i>	Leaves	Picking leaves or stems and thresh the leaves
<i>Vaccinium myrtillus</i>	Leaves and fruits	3 Methods: i.picking just fruits and leaves by hand; ii.cutting flowering shoots and threshing fruits and leaves; iii.cutting the whole plant and threshing
<i>Arnica montana</i>	Flowers and roots	Picking the whole plant
<i>Hypericum androsaemum</i>	Flowering shoots	Cutting the above-ground part
<i>Lavandula stoechas</i>	Flowering shoots, flowers	2 Methods: i.cutting the flowering branches, dry them and then remove the flowers ii.cutting plants, dry them and keep only the flowering branches
<i>Lavandula viridis</i>		
<i>Origanum vulgare</i> subsp. <i>virens</i>		
<i>Mentha cervina</i>	Flowering shoots	Picking the whole plant
<i>Thymbra capitata</i>	Flowering shoots; Leaves	Collecting flowering shoots or cutting the above-ground part
<i>Thymus caespititius</i>	Flowering shoots	Cutting the aerial part or the whole plant
<i>Thymus mastichina</i>		
<i>Foeniculum vulgare</i>	Fruits, sometimes roots and leaves	Cutting the young plants in the spring, cutting aerial part; the seeds are harvested for use in cooking and to flavor liquors.



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Species	Collected part	Collection method
<i>Asphodelus ramosus</i>	Rhizome	Picking whole plant
<i>Fragaria vesca</i>	Roots	
<i>Gentiana lutea</i>	Rhizomes and roots	
<i>Tuberaria lignosa</i>	Roots, shoots and inflorescences	
<i>Ruscus aculeatus</i>	Rhizomes and roots, shoots	Cutting the aerial part (shoots), or picking the whole plant

Most of the wild harvested MAP species (being traded or not) are very common, growing broadly in Portugal and without conservation problems. For this reason, in general no measures for assuring sustainability are neither proposed by environmental authorities nor adopted by collectors. As well, although ecological studies and research work is been carried out for some of these species, there is not any plant population monitoring system.

Spain

The official register of MAPs is not continuous in time: categories and information may change from year to year, data for each category are not always reported every year and, of course, volumes and values coming from not declared activities are not reported and reflected at all.

At the same time, other facts may contribute to the lack of register of non-wood productions, such as the forest property regime and management plans in Spain (70% of forests are under private property and only around 19% of the forest area is under a management plan) and the registration of market commodities, which are defined broadly in general categories without differentiating each wild collected MAP species.

This situation leads to consider official data on volumes and values of NWFP, especially MAPs, as unrealistic and inconsistent, as well as, it compromises the analysis of the state of the art of wild harvesting and the detection of trends in the sector.

The most recent data on values of MAPs (44.440 €/year, being 0.01% of the total value of NWFP in Spain) were referred to year 2005 (MAGRAMA 2011¹). In this National report the production of NWFP was officially considered as a medium quality indicator, due to the lack of data availability.

Some other available data come from results of different technical and scientific projects.

For example, according to a Traffic-Europe study (Blanco & Breaux, 1997) more than 800 species are used as MAP in Spain. 25% of them have commercial use (52% from the wild), and 75% with non-commercial use or commercialised but with few importance.

¹ Ministerio de Agricultura, Alimentación y Medio Ambiente (MAGRAMA). 2011. *Informe sobre el estado de los bosques. Criterios e indicadores de gestión forestal sostenible 1990-2010*. Área de Inventario y Estadística Forestal. MAGRAMA. http://www.magrama.gob.es/es/biodiversidad/temas/montes-y-politica-forestal/C%26l_version_web_definitva_tcm7-186904.pdf



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The most recent study (CTFC, 2011²) reported that the most collected wild species for commercial purposes were yellow gentian (*Gentiana lutea*) in Catalonia with a production of 20t/year dried root in 2011 with an estimated value of 150.000-170.000 €/year; arnica (*Arnica montana*), 1260 kg dried flowers/ year in 2009, from Galicia (18.900-37.800 €/year in Spain); bearberry (*Arctostaphylos uva-ursi*), 25 t/year dried leaves in 2011, from Guadalajara and Soria (68.750-98.000 €/year in Spain).

Table 4 shows the most commonly collected MAP species for commercial purposes. Harvesting rates and return periods are established only for some species, coming from scientific studies in Catalonia (*Gentiana lutea*, *Arctostaphylos uva-ursi* and *Arnica montana*), Castilla- León (*Gentiana lutea*) and Galicia (*Arnica montana*).

Table 4. Most collected MAP species in Spain for commercial purposes.

Species	Collected part	Return period & harvesting rate Collecting method
<i>Gentiana lutea</i>	Roots	Catalonia: 10 years return period, < 50 % harvesting rate, only flowering plants or adult plants and homogeneity
<i>Arctostaphylos uva-ursi</i>	Young shoots	Catalonia: 3 years return period, < 40% harvesting rate (actually 20%), cutting manually, spring & autumn, homogeneity Castilla-La Mancha: > 50% harvesting rate and mechanically
<i>Cistus ladanifer</i>	Flowering shoots / exudate of older branches	Andalucía: Manually, labdanum (flower resin) is collected just before flowering in April-May
<i>Thymbra capitata</i>	Flowering shoots	No data
<i>Thymus mastichina</i>	Flowering shoots	No data
<i>Thymus vulgaris</i> , <i>T. zygis</i> , <i>T. hyemalis</i>	Flowering shoots	No data
<i>Salvia lavandulifolia</i>	Flowering shoots	No data
<i>Sideritis sp.</i>	Flowering shoots	No data
<i>Rosmarinus officinalis</i>	Flowering shoots	No data
<i>Satureja fruticosa</i> (<i>Micromeria fruticosa</i>)	Flowering shoots	No data

Other plant resources gathered for commercial purposes, but less important, are *Crataegus monogyna* (flowers), *Jasonia glutionsa* (flowering shoots), *Foeniculum vulgare* (flowering plant), *Lavandula latifolia* (flowering shoots), *Juniperus communis* (fruit) and *Arnica montana* (flower caps).

Medicinal species are extracted mainly from northern regions (Galicia, Catalonia, Castilla-La Mancha, Catilla-León) and mountainous areas (Pyrenees, Iberian and Cantabric ranges), meanwhile aromatic species from southern regions (Figure 1).

² CTFC. 2011. *Bases tècniques per a la regulació de l'aprofitament comercial d'espècies vegetals*. Informe Addenda 2011. Direcció General de Medi Natural. Generalitat de Catalunya.

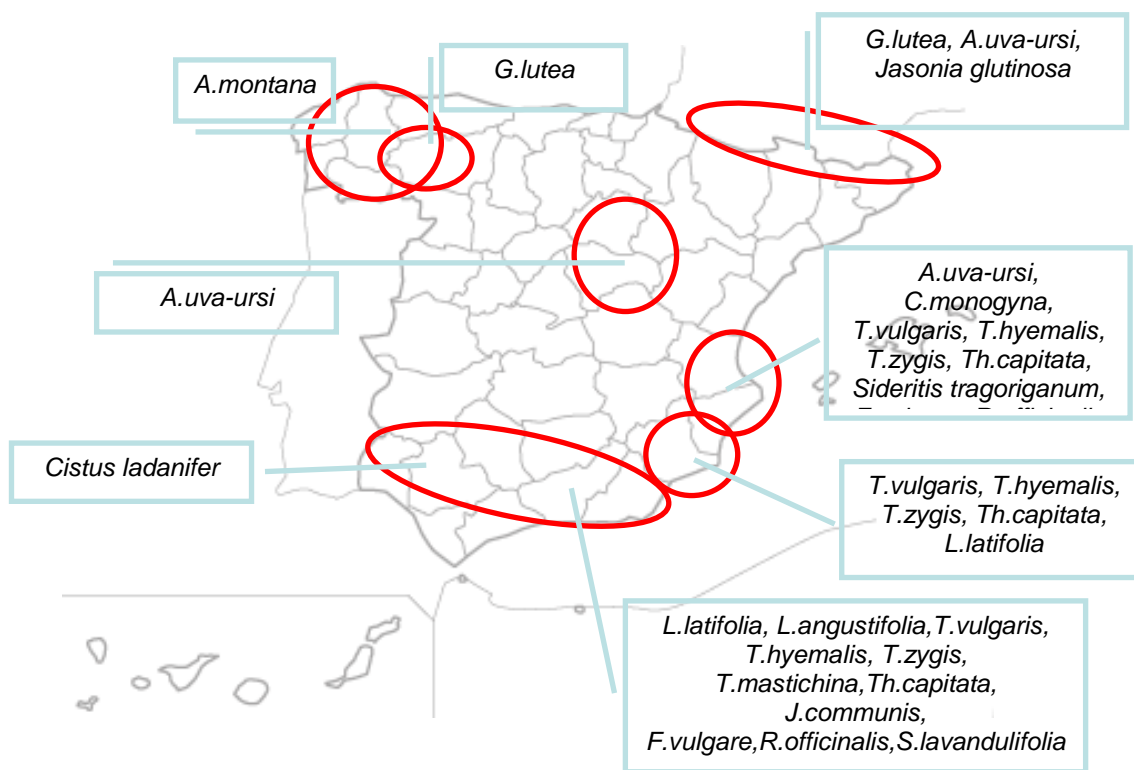


Figure 1. Harvesting regions in Spain, by species.

Moreover, harvesting activity has been decreased last years, almost disappearing for some MAPs (*Juglans regia*, *Betula pendula*, *Arenaria rubra*, *Herniaria glabra*, *Jasonia glutinosa*, *Sambucus nigra*, *Tilia playphyllos*) mainly due to loss of elder harvesters.

Nevertheless, wild harvesting of non-commercial species has a high social value, linked to the conservation of cultural heritage. Many different species are collected in very few quantities in general for household consumption. However, sometimes these volumes are commercialised in local markets or local herbalist's shops. It is difficult to delimit what is commercial and non-commercial use when few quantities are collected.

Turkey

It is reported that the number of commercially wild collected plants is about 347 in Turkey. About 20 different plants as average 36126 tones were exported 80388 USD income was gained during 2004-2008 years. The income from MAPs in 2008 was 101710 USD (Bayram et al., 2010). Turkey is of big exporters for Medicinal and Aromatic Plants (MAPs) and about 100 different countries buy MAPs from Turkey. These materials were obtained from wild collection and cultivation. According to statistical data, the most wild collected-exported MAPs from Turkey and their quantities in 2008 were: bay leaf (6933 tones), carob (3559 tones), capers (In 2006, 2051 tones), Thyme (As 20 % of the total export, *Origanum* sp, *Thymus* sp., *Thymbra* sp, *Satureja* sp., 1937 tones), sumac (1175 tones), rosemary (573 tones), licorice (227 tones), linden flowers (121 tones), and mahaleb (102 tones). Wild collected MAPs have gradually increased by the years in Turkey. Some of wild collected plant species have started to domesticated and cultivated in the fields, recently. Although all the export material has been obtained from wild plants in recent times, Oregano (*Origanum onites* L. and *Origanum syriacum* L.) cultivation started in last decades in western part of Turkey. Nowadays, almost all the



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exported oregano (80 %) has been cultivated under field conditions according to organic farming rules. Only 20 % of the material has been wild-collected from nature.

Table 6a. MAP Species most collected in Turkey for commercial purposes

Species	Collected part	Annual volume in 2008 (kg dried weight)*
Bay leaf	Leaf	6.933.000
Carob	Fruit	3.559.000
Capers	Bud	2.051.000
Thyme species (<i>Origanum</i> spp., <i>Thymus</i> spp., <i>Thymbra</i> spp., <i>Satureja</i> spp. etc.)	Herba	1.937.000
Sumac	Fruit	1.175.000
Rosemary	Leaf	573.000
Licorice	Stolon	227.000
Linden	Flower	121.00
Mahaleb	Kernel	102.00

(Bayram et al., 2010)

In the project part, Kilis, located in southeastern part of Turkey, there is wild collection of some wild edible, medicinal and aromatic plants for commercial and non-commercial uses. In spring time about 20 different wild edible plants have been collected mainly home uses. A small part of these plants are sold in local bazaars. There is no extinction problem for these plants. The main problem is commercially collected wild plants in the region. The most collected plants both non-commercial and commercial purposes are: zahter (*Thymbra spicata* L.), sumac (*Rhus coriaria* L.), licorice (*Glyrrhiza glabra* L.) and capers (*Capparis* spp.). Approximate data for these plant materials is given in Table 6b.

Table 6b. MAP Species most collected in Kilis both commercial and non-commercial purposes

Species	Collected part	Collection Method	Annual volume (kg)
Zahter (Fresh)	Herba, bud	Picking the sprout and buds	10.000
Zahter (Dried)	Leaf	Picking the whole plant	5.000
Licorice (Dried)	Stolon	Digging for stolon	5.000
Sumac (Dried)	Fruit	Picking the fruits	2.000
Capers (Fresh)	Bud	Picking the buds	750

Quantity of wild collected plant materials have gradually decreased in Kilis district related to climatic change and drought, early stage harvest, excessive collection, unsuitable collection methods, animal damage (sheep and goat), soil erosion, field opens etc. Among these reasons, excessive and unconsciously collection of wild plants is the main point threatens the plants. However, a special strategy should be applied for zahter that is a crucial importance for local people and various foods are produced from. In recent years, the consumption of fresh and dried zahter have considerably increased related to industrial zahter products (zahter pickle, breakfast zahter, dried leaf as spice and herbal tea) production in local factories. Thus, the theme of the project for Kilis is Zahter.

Bayram, E., Kırıcı, S., Tansı, S., Yılmaz, G., Arabacı, O., Kızıl, S., Telci, Đ., 2010. "Increasing Possibilities of Medicinal and Aromatic Plants Production". VII. Technical Congress of Turkish Agricultural Engineers. Proceedings-I, 437-456, January, 11-15, 2010, Ankara.



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Legal Framework

Lithuania

The legal framework regarding wild harvesting of non-wood forest products in Lithuania is a reflection of the importance of these resources in the country, both for commercial and non-commercial purposes.

In this context, besides the international and European normative on habitats and species conservation, at national level there are the following norms that regulated the use of wild resources:

- *Law on environmental protection* (1992): legal basis of all laws and regulations on the use of natural resources and environment conservation.
- *Law on protected animal, plant and fungi species and communities* (1997, amended in 2001 & 2010): the use of protected species (Directive EEC 92/43 and Red Data Book of Lithuania) is allowed with a permit issued by the Ministry of Environment.
- *Red Data Book of Lithuania* (1981, 1992, 2007). List of protected species. 50 species considered as MAP are strictly protected from any usage and harvesting. Among them, *Allium ursinum*, *Arnica montana*, *Mentha longifolia* and *Salvia pratensis*. This normative is adopted by collectors because of low sources of raw material, these species are not purchased and also because people have some knowledge about species protection.
- *Law on wild vegetation* (1999): general provision of legal acts and legislative measures on sustainable WH of non-wood forest products.
- Different regulations on the use of wild flora resources: permissions for wild harvesting are required to any legal person using wild harvested resources for trade. This permit last for only 1 year. An average of 27 permissions was issued in the period 2007-2011. In case of MAPs the harvesting and trade of certain species is regulated:
 - o Harvesting rates and return period are referred for the gathered species (Table 1).
 - o Harvesting and trade is limited and a special permit is required for *Centaurium pulchellum*, *Centarium erythraea*, *Chimaphila umbellate*, *Hierochloe australis* and *Hierochloe odorata*.
 - o Wild harvesting of leaves and flowers (not for medicinal purposes) for *Convallaria majalis*, *Primula veris* and *Digitalis grandiflora* is forbidden.
 - o Gathering of cranberries (*Oxycoccus palustris*) is allowed in 2 Strict Nature Reserves only for a very short period and only for local people with special permission issued by each Strict Nature Reserve.
- Methods of wild plant resource assessment for different MAP species were established by law in 2000: setting up of the accounting methods for monitoring and control populations of the most important wild MAP species in Lithuania: *Thymus serpyllum*, *Thymus pulegioides*, *Urtica dioica*, *Ledum palustre*, *Hypericum perforatum*, *Hypericum maculatum*, *Juniperus communis*, *Cetraria islandica*, *Convallaria majalis*, *Lycopodium annotinum*, *Menyanthes trifoliata*, *Helichrysum arenarium* and *Calluna vulgaris*.



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Although most of the normative is adopted by harvesters, some of them are not yet well known or are partly left out, e.g., leaves of *Allium ursinum* (strictly protected) are picked in some populations every year and leaves and flowers of *Convallaria majalis* (harvesting forbidden) are collected each year for sale for ornamental purposes. As well, traditionally whole *Lycopodium* spp. and *Cetraria islandica* plants are collected, used for Palm Sunday and Easter decorations, sold in markets.

Portugal

The International and European normative on habitats and species conservation adopted by the Portuguese government, the following norms regulate the use of four wild resources collected in Portugal:

- *Arnica montana*, *Gentiana lutea* and *Ruscus aculeatus* (Directive 92/43 EEC - Annex B-V): wild harvesting and exploitation may be subject to management measures.
- *Prunus lusitanica* ssp. *azoricus* (Directive 92/43 EEC - Annex B-II): specific conservation reserves where wild harvesting is forbidden.

At national and regional level, the main legislations adopted are:

- At national level: D-L 423/89 and D-L 254/2009, on the protection of *Ilex aquifolium* and prohibition of its wild harvesting.
- At regional level: Resolution of the Ministers Council 11-B/2011 established a protection area type 1 for *Cistus ladanifer* ssp. *sulcatus* (= *Cistus palhinhae*) in Odemira and in the biogenetic reserve of Sagres.
- D-L 140/99 and D-L 49/2005 are the Directive 92/43 EEC - Annex B-II and Annex B-V transcriptions. The vegetal species list of community interest, whose capture or collect in the wild and exploitation may be subject to management measures (Annex B-IV of D-L 140/99 and Annex B-V of D-L 49/2005), where a long vegetal species list are identified, the *Arnica montana*, *Gentiana lutea* and *Ruscus aculeatus* species are included. The animal and plant species list of community interest whose conservation requires the designation of special areas of conservation (Annex B-II of D-L 140/99 and D-L 49/2005), are identified a long vegetal species list where *Prunus lusitanica* ssp. *azoricus* is one of them.

The real application of these norms is uncertain.

Table 7 indicates the most relevant national laws to take into account for the sustainability of wild collection in Portugal.

Table 7. Most relevant laws in Portugal related to sustainable wild harvesting.

Region	Wild collected species	Control system
Decree-Law (Decreto-Lei n.º 423/89 de 4 de Dezembro)		
Brief description: Prohibition, throughout the country, picking the whole plant, the total or partial cut, transport and sale of spontaneous <i>Ilex aquifolium</i> .		
Portugal		Sanction system
Decree-Law (Decreto-Lei nº 226/97 de 27 de Agosto)		
Brief description: Conservation of natural habitats and of wild fauna and flora, as the national contribution to the conservation and restoration of natural habitats and endangered species		
ANNEX II		
Animal and plant species of community interest whose conservation requires the designation of special areas of		
Portugal		Sanction system



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Region	Wild collected species	Control system
	<p>conservation ANNEX IV Animal and plant species of community interest that require strict protection. In order to protect the plant species listed Annex IV of this law, are prohibited: a) The collection, harvesting, cutting, uprooting or destruction of plants within their natural environment within its native range; b) The possession, transportation, sale or exchange, and offering for sale or exchange of specimens of such species collected from the wild, except for legally harvested before the entry into force of this law</p>	
<p>Decree-Law (Decreto-Lei n.º 140/99 de 24 de Abril)</p>		
<p>Brief description: Conservation of natural habitats and wild fauna and flora, as contribution to the conservation and restoration of natural habitats and endangered species; Revokes: D-L 226/97 August, 27</p>		
<p>Portugal</p>	<p>ANNEX IV-B Animal and plant species of Community interest that require strict protection ANNEX B-V Animal and plant species of community interest whose capture or collect in the wild and exploitation may be subject to management measures. In order to protect the plant species listed in Annex IV-B, are prohibited: a) The removal, cutting, uprooting or destruction of plants or parts of plants in their natural environment and within their natural range; b) The possession, transportation, sale or exchange, and offering for sale or exchange of specimens of such species collected in the wild, except for specimens legally harvested before the entry into force of D-L 226 / 97 August, 27.</p>	<p>Sanction system</p>
<p>Decree-Law (Decreto-Lei nº 49/2005 de 24 de Fevereiro)</p>		
<p>Brief description: First amendment to D-L 140/99 April, 24</p>		
<p>Portugal</p>	<p>ANNEX II-B Animal and plant species of community interest whose conservation requires the designation of special areas of conservation. ANNEX IV-B Animal and plant species of community interest that require strict protection To ensure the protection of species listed in Annexes II-B and IV-B, are prohibited: a) The removal, cutting, uprooting or destruction of plants or parts of plants in their natural environment and within their natural range; b) The possession, transportation, sale or exchange, and offering for sale or exchange of specimens of such species collected in the wild, except for specimens legally harvested before the entry into force of D-L 226 / 97 August, 27.</p>	<p>Sanction system</p>



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Region	Wild collected species	Control system
	Animal and plant species of Community interest whose capture or collect in the wild and exploitation may be subject to management measures	
Decree-Law (Decreto-Lei n.º 254/2009 de 24 de Setembro)		
Brief description: Approves the Forest Code		
	Article 66.º Aromatic, medicinal and culinary plants The harvest of herbs, medicinal and culinary plants in public forests should be conducted in accordance with the requirements of forest management plans for the areas concerned.	
	Article 67. Shall be prohibited throughout the country, starting, full or partial cutting, transport and sale of spontaneous <i>Ilex aquifolium</i> .	Sanction system
Portugal		
The Resolution of Ministers Council Resolução do Conselho de Ministros n.º 11-B/2011		
Brief description: Spatial Plan of the Natural Park of Southwest Alentejo and Costa Vicentina (POPNSACV) was approved by D-L 33/95 December, 11 in order to ensure proper management safeguarding the natural resources, promotion of sustainable development and quality of life of populations. In 1999 the D-L 9/99 June, 15 was published which adds a new Article and two annexes, one of them containing the management protocol.		
	Endemic area of scrubland with <i>Cistus ladaniifer</i> ssp. <i>sulcatus</i> (<i>Cistus palhinhae</i> =) Southend on Sea and	
Parque Natural do Sudoeste Alentejano e Costa Vicentina	Martinhal as well as part of the area classified as a Biogenetic Reserve Ponta de Sagres	Sanction system

Spain

The international and European normative on habitats and species conservation adopted by the Spanish government, affect to the 3 species wild collected in Spain:

- *Arnica montana*, *Gentiana lutea* and *Arctostaphylos uva-ursi*: international trade of these 3 species must be controlled and registered (CITES Reg. CE 338/97 & mod (latest CE 709/2010) – Annex D); and wild harvesting of *G. lutea* and *A. montana* and exploitation may be subject to management measures (Directive 92/43/CEE Habitats - RD 1997/1995 and Law 42/2007 on Natural Heritage & Biodiversity)

At National scale, Law 42/2007 of Natural Heritage and Biodiversity define the general legal framework on conservation and use of wild species and resources:

- List of wild species with a special protection regime and Spanish list of threatened species (RD 39/2011).
- Strategy for the Natural Heritage and Biodiversity 2011-2017 (RD 1274/2011) related to sustainability.

This national framework is transferred and implemented in each of the 17 Spanish Autonomous Communities (=region) by the regional government, with their own laws. This specific situation gives a total of 17 Regional lists of threatened species and, regarding wild collection of MAP species, a license for harvesting certain MAP species are required in 5 regions (Murcia, Castilla-León, Andalucía, Balearic Islands and Catalonia).



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Besides this, there is also a legal framework (at national and regional level) that regulates the use and management of forest and their products, for any species. Regarding wild harvesting, progress had been done in establishing a clear framework for the sustainable use of wild resources, but it is still not very well-known among producers and it is not totally implemented.

In Catalonia: the Catalan Forest Law (6/1988) had set up the framework of exploitation of any resource from the forest (wood or non-wood) and D.L 3/2010 stated the obligation of declaring any activity related to NWFP exploitation in non-managed forest (responsibility statement). However, harvesters, and even foresters, do not know still this norm or how to implement it.

Table 8 indicates the most relevant regional laws to take into account for sustainability of wild collection.



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Table 8. Most relevant laws in Spain at regional level related to sustainable wild harvesting.

Region	Wild collected species	Control system
Law 6/1988, forestal de Catalunya & Dec 3/2010		
Brief description: Exploitation of fruits, resins, MAPs, mushrooms (including truffle), bee products, and other forestry products can be subject to licensing when it can damage the balance of the forest ecosystem or persistence of the species or if excess amounts fixed by the competent authority forest; any not licensed use must be announced to the forestry authority with a Responsibility Statement.		
Catalonia	All the ones not strictly protected or regulated	Foresters visits/controls, reports by forests owners due to damage to environment. Low harvesting rates do not justify excessive bureaucracy
Ordre 5/11/84		
Brief description: Harvesting, cutting or pulling up plants is under license in Catalan territory.		
Catalonia	<i>Gentiana lutea</i> (Annex 2)	Foresters visits/controls. Sanction system; very few harvesters ease the control system
D. 50/2003		
Brief description: List of protected wild flora in Murcia Region and normatives regarding the exploitation of understory and forest plant species.		
Harvesting under lisenca in private forest of the following genus/species: <i>Terfezia</i> sp. pl., <i>Pinus</i> sp. pl., <i>Quercus coccifera</i> , <i>Limonium</i> sp. pl., <i>Capparis</i> sp. pl., <i>Rhamnus</i> sp. pl., <i>Pistacia</i> sp. pl., <i>Olea europaea</i> , <i>Lavandula</i> sp. pl., <i>Micromeria</i> sp. pl., <i>Salvia lavandulifolia</i> s.l., <i>Satureja</i> sp. pl., <i>Sideritis</i> sp. pl., <i>Thymus</i> sp. pl., <i>Antirrhinum barrelieri</i> , <i>Trachelium coeruleum</i> , <i>Lonicera</i> sp. pl., <i>Artemisia absinthium</i> , <i>Santolina</i> sp. pl., <i>Phoenix dactylifera</i> , <i>Colchicum</i> sp. pl., <i>Ornithogalum</i> sp. pl., <i>Ruscus aculeatus</i> , <i>Tulipa sylvestris</i> , all species of <i>Amaryllidaceae</i> , <i>Iridaceae</i> and <i>Orchidaceae</i> species. VU: <i>Micromeria fruticosa</i> , <i>Juniperus communis</i> subsp. <i>hemisphaerica</i> ; Special Interest: <i>Crataegus monogyna</i> , <i>Cistus ladanifer</i> .		
Murcia	Interest: <i>Crataegus monogyna</i> , <i>Cistus ladanifer</i> .	Sanction system
Law 8/2003 (wild flora & fauna) & Dec 23/2012 (conservation and sustainable use of wild flora & fauna and their habitats)		
Brief description: List of protected wild flora and fauna in Andalusia Region and normatives regarding the exploitation of wild species. Creation of the Andalusian Registry for the exploitation of wild flora and fauna		
Andalucia	All (protected and not protected)	Sanction system
Dec 63/2007 (list of protected wild flora)		
Brief description: List of protected wild flora species in the Castilla-Leon Region and creation of Flora Microreserves as protection category. The lists includes a category with species which exploitation is subject to license.		
Castilla y León	WH species: <i>Narcissus</i> section <i>pseudonarcissus</i> L. (> 20 flowers or bulbs); more than 2kg of <i>Santolina oblongifolia</i> Boiss, <i>Arnica montana</i> L., <i>Gentiana lutea</i> L., <i>Sideritis hyssopifolia</i> L., <i>Ruscus aculeatus</i> L.	Sanction system



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Region	Wild collected species	Control system
Dec 75/2005 (list of endangered and special protection species)		
Brief description: List of protected wild flora and fauna in Balearic Island Region, creation of Critical Biological Areas and Balearic Council of Fauna and Flora. The list includes the category of "special protection", which refers to species with ecological, scientific, cultural or socio-economic interest that should be protected.		
	Within the special protection category, there is a list of flora species subject to commercial exploitation license: <i>Crithmum maritimum</i> , <i>Chamaerops humilis</i> , <i>Dorycnium fulgurans</i> , <i>Myrtus communis</i> , <i>Rhamnus alaternus</i> , <i>Ruscus aculeatus</i> , <i>Santolina chamaecyparissus</i> , <i>Teucrium marum subsp. occidentale</i> , <i>Viburnum tinus</i> . For these species, non-commercial uses (below 1kg of plant or 3 individuals in case of food or ornamental species) and <i>Chamaerops</i> artwork uses are not subject to licence. As well, authorised felling action that can affect these species, do not require any licence.	Sanction system. Easy control due to very few harvesters.
Balearic islands		

Turkey

There are a number of laws for conservation of natural resources and wildlife in Turkey. Turkish Ministry of Forest and Water Affairs, Turkish Ministry of Environment and Urbanization, Turkish Ministry of Food, Agriculture and Livestock are responsible for conservation and managing of biodiversity and wildlife.

Wild useful plants growing either under forest or not, are generally called as Non-wood Forest Products (NWFP) in Turkey. In practice, wild collection or harvesting of these kinds of products for commercial uses need permissions from local Forest Bodies, except for home used materials. In practice, there could be some handicaps for laws application by the regions.

According to Turkish laws, wild harvesting of plants (Turkish Republic Forest Laws 6381/14c: It is forbidden the wild collection of valonia oak, linden flowers, plants in all the flora, medicinal and aromatic plants seeds etc.) is strictly forbidden by Turkish Republic Forest Laws and applied penalty fine. There is no differentiation between the commercial and non-commercial use of NWFP. Application of the laws may change in different regions of Turkey. However, some problems may come out between Forest Officers and local people. The laws should be updated for usage purposes (Türker, 2011). Although there are strict rules for wild harvesting of NWFP, Turkey forests are under threat by excessive collection.

In 2013, "The Draft Law on Nature and Biodiversity Conservation" will be discussed in The Grand National Assemble of Turkey. It is expected that this law will be useful for conservation and sustainable use of natural resources in Turkey.

Türker, Y.Ö., 2011. The Legal Principles for Utilization of Non-Wood Forest Products. Journal of the Faculty of Forestry, Istanbul University. 61 (1):13-21.

In addition, bulbous plant species have a great importance by means of extinction. So, Turkish Government releases some collection and export quotas about them. They publishes ever year a table indicating forbidden wild-collection species, trade quotas and permits from cultivation. This sheet can also be obtained from website (<http://www.resmigazete.gov.tr/eskiler/2012/12/20121206-16.htm>) since 2013. For other endangered plant species, there is published RED DATA BOOK of Turkey, as well.



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Guidelines and certification

Lithuania

In Lithuania, 3 different permissions of wild harvesting of MAP are issued by the Government:

1. Permission for import/export only for protected species.
2. Permission for collection, purchase, sale and export of all non-protected species of MAP, for 1 year. It is adopted mainly by companies.
3. Permission for collection of *Centaurium pulchellum*, *Centaurium erythraea*, *Chimaphila umbellata*, *Hierochloe australis* and *Hierochloe odorata*, for 1 year. It is adopted mainly in case of organic wild harvesting.

Besides this permissions and the organic certification, no other kind of guidelines or certification standards specific on sustainable wild harvesting are adopted in Lithuania. In case of organic certification, government permissions are mandatory.

Portugal

In Portugal the only one existing guidelines related to wild harvesting of plant resources is the organic certification system, provided only by ECOCERT Portugal. This organic certification is demanding the producer's commitment regarding:

- Safety and quality of wild harvested products, which must be free of contaminations. Wild harvesting must be carried out in areas not close to sources of environmental pollution (e.g. roads) and that harvested products must be dried and processed under hygienic conditions.
- Maintenance of the conservation status of the habitat and species within the gathering area.

Spain

In Spain there are not guidelines neither certification standards developed for sustainable wild harvesting, although have been reported incentives for their implementation in Andalucía in 2012, and it is assumed in the Strategy for the natural heritage and biodiversity 2011-2017. Specifically, some studies carried out in Catalonia have suggested technical recommendations for *Gentiana lutea*, *Arctostaphylos uva-ursi* and *Arnica montana*.

Harvesters could follow up international guidelines (ISSC-MAP, FairWild standard), but there is a lack of technical information for assuring long-term conservation of species. Even, harvesters do not know these standards, just knowing some organic standards at most, and the only premise that they have interiorized is that plants used for health must be free of contaminations.

At international level, only one organic certification agency is advising on sustainable wild harvesting: "Manual for sustainable collection practices" (IMO, 2010).

In Spain, organic certification is carried out by public and private certification bodies. In 14 Regions there is operating only 1 public certification body (1 by region); in Andalucía and Castilla-La Mancha regions certification bodies are private. In Aragon, operate both public and private certification bodies.



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Generally, according to Spanish organic certification standards, wild harvesting of plants and parts thereof, growing naturally in natural areas, forests and agricultural areas is certified as ORGANIC when:

- 1) for a period of at least three years before collection, have not treated with products not authorized for use in organic production and,
- 2) wild harvesting does not affect the stability of the natural habitat or the maintenance of the species in the area.

Control system is based on inspector visits to harvesting and drying sites.

Turkey

There are no guidelines for wild harvesting standards in Turkey. But, some private organic certification companies have special rules for organic production of wild plant products. According to these rules, anybody should apply for organic production of MAPs and must strictly obey the given rules. After some years, they can use organic certificate for their wild collected plant materials. The rules for organic certification are the same as other countries.

Existing training

Lithuania

Regular training on wild harvesting is provided by two Lithuanian universities, which include courses on biodiversity and sustainable use or economic botany within their education plans.

Besides this, in the period 2008-2012, 4 different voluntary trainings were held in Lithuania regarding wild harvesting and processing of MAP species. Three of them were addressed to a general public, giving them basic information on medicinal plant raw material, gathering from the wild, processing and use. The Botanic Garden of Vytautas Magnus University and the Institute of Botany are the organizing institutions of these trainings.

The remaining voluntary training was a 1 year-course especially issued for collectors of the rural community *Pagegiu Krastas* (LEADER project), with specific information on harvesting rules and calendar for different wild-collected MAP species, together with growing and processing.

Portugal

Within the last 5 years, only 1 training adult course regarding wild harvesting was held in 2010-2011 in Portugal. The course involved both theoretical and practical training (600 and 200 h) and was addressed to young and adult people suitable to develop an economic activity based on MAP production. A total of 12 students attend the course.

Spain

Regarding MAPs wild harvesting there has been several training activities since 2000.

In the period 2000 – 2006, there has been developed 7 courses and 4 specific lectures on courses (3 within the Master on Medicinal and Aromatic Plants and Phytoterapy of University of



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Barcelona and 1 within the Degree in Forest Management of University of Lleida, all in Catalonia region.

In the period 2007-2012, 1 course on wild harvesting of yellow gentian has been organised in Villablino, León (Castilla y León region), and 7 lectures in courses:

- 4 within the Training Degree in Natural Resource Management (School of Agricultural Training, Solsona, Government of Catalonia) – Subject: Medicinal and Aromatic Plants
- 1 within the Training Degree in Gardening (School of Agricultural Training, Barcelona, Government of Catalonia) – Subject: Forest sustainable management.
- 1 within an Environmental guides course (CTFC, Solsona, Government of Catalonia)
- 1 within the Graduate Course of Naturist Medicine (University of Zaragoza, Aragon)

Turkey

In Turkey, there is no regular training for wild harvesting of Medicinal and Aromatic Plants. Sometimes, any training could be organized by academicians at universities and/or local governmental bodies under national or international projects in different regions of Turkey.

During the last 5 years, 1 voluntary seminar related to wild harvesting of *Thymbra spicata* was organized by the Kilis 7Aralik University, in 2012, within the framework of the Plant Wild Grundtvig project. The seminar included theoretical information and field demonstrations for sustainable harvesting and was addressed to all stakeholders (farmers, collectors, spice sellers, npo & companies).

In 2013, the same institution, jointly with AMAPMED, is going to hold another workshop/seminar on wild harvesting methods and sustainable use of different MAP species (*Thymbra spicata*, *Rhus coriaria*, *Pistachia terebinthus*, *Glycyrrhiza glabra*).



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Needs on training

Target stakeholders and ways of training

Six different categories of stakeholders were identified within the supply chain of wild collected medicinal and aromatic plants: collectors, forest owners, policy makers, wholesalers, companies and consumers. Another category (Others) was added, in case of a partner needed to define more stakeholders.

All partners agreed that all the previously defined stakeholders were important to be trained or, at least, informed. However, most of the partners considered only collectors, forest owners and policy makers as key agents (Figure 2) when WH must be improved with sustainability topics.

Companies (e.g. phytochemical laboratories) were considered of intermediate importance by the majority of partners. Wholesalers were considered as key agents by the half of the partners and intermediate by the other half. Finally, consumers were assigned to a lower degree, since partners considered them only of intermediate-low importance.

Only one partner (Spain) added the foresters as a stakeholder to be taken into account. They were considered with intermediate importance, since they could link policy makers and collectors.

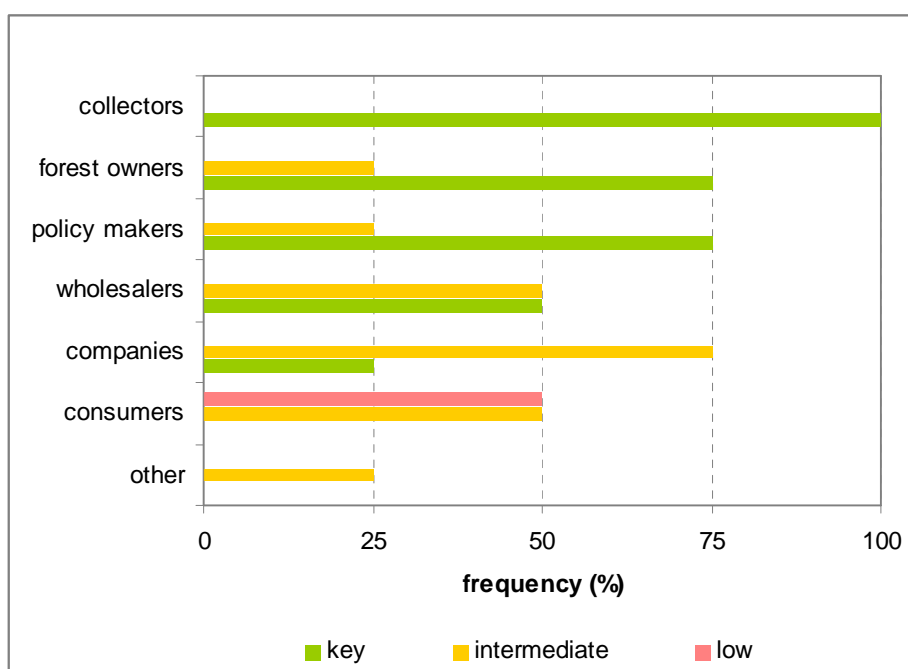


Figure 2. Importance of stakeholders considering SWH training.

A total of 8 potential training actions about sustainable wild harvesting were defined in the questionnaire:

- Regular training: courses and workshops included in official training courses.
- Voluntary training: courses and workshops not included in official training courses.
- Divulagation documents: leaflets, posters, videos.



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- Technical documents: documents with technical or scientific information.
- Open seminars: i.e. seminars or workshops related to the transfer of knowledge included in scientific projects.
- Mobile apps
- Media actions (TV, radio and press releases)
- On-line training, regular or voluntary.

A training action was considered as optimal for a concrete group of stakeholders when at least $\frac{3}{4}$ of partners agreed in it. For the key agents, the optimal training actions were the following ones (Figure 3):

- Collectors: regular training and open seminars (all partners agreed), technical documents and divulgation documents ($\frac{3}{4}$ partners agreed)
- Forest owners: technical documents, open seminars, divulgation documents and media actions were considered optimal by all partners; regular training and on-line training were considered optimal only by $\frac{3}{4}$ of partners.
- Policy makers: all partners considered only media actions as the optimal way to reach policy makers. Other actions that could be important to use were technical documents and divulgation documents.

Results for the not-key agents (i.e. wholesalers, companies and consumers) are showed in Figure 4. All partners agreed that the best way to reach them where divulgation documents. Only 75% partners considered regular training and technical documents useful for training wholesalers and companies. For the last ones, also media actions where considered important to be use for training. In case of consumers, media actions and mobile apps were pointed as important training actions by 75% partners.

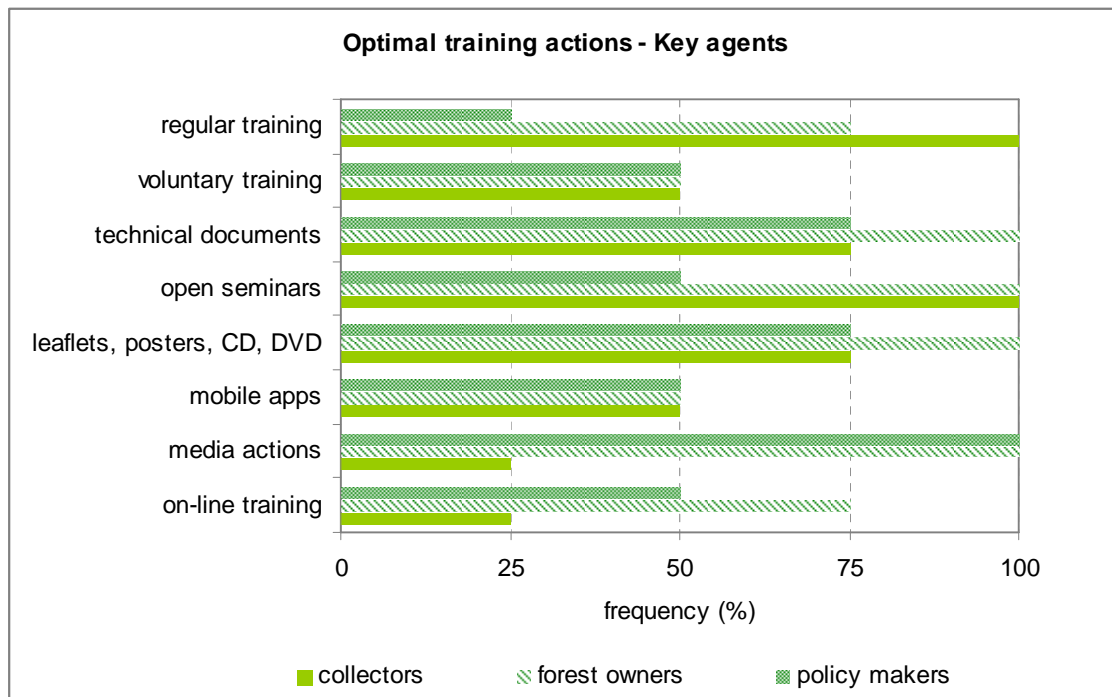


Figure 3. Optimal training actions for each key agent in the implementation of SWH.



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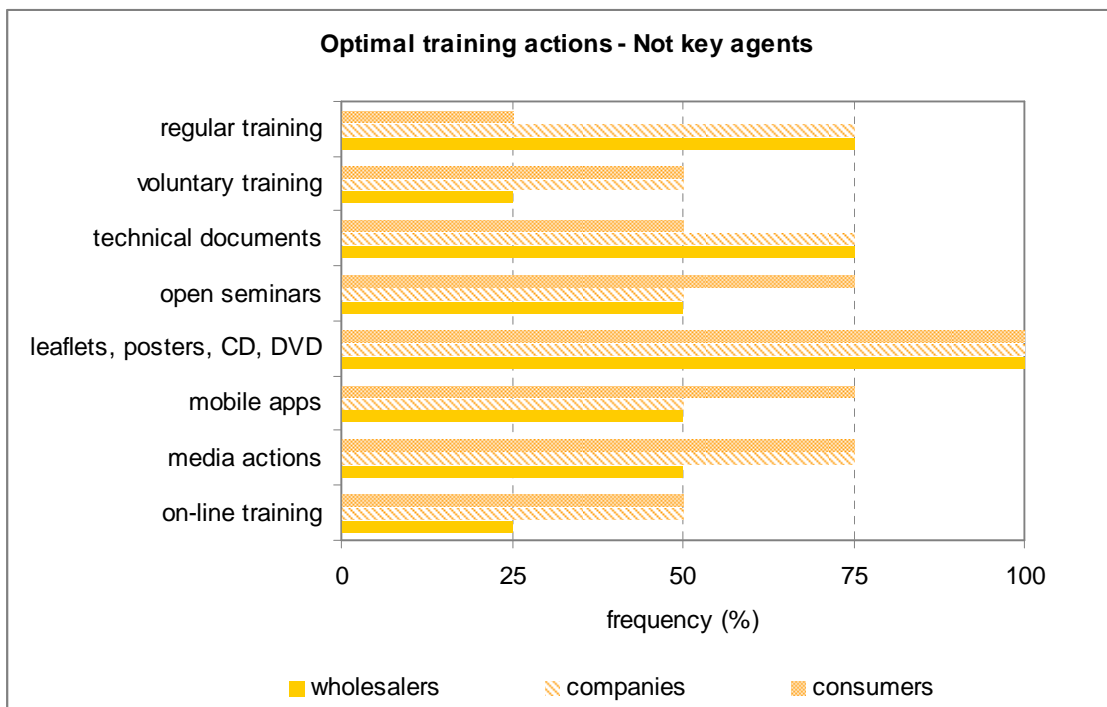


Figure 4. Optimal training actions for each not-key agent in the implementation of SWH.

Interest in promoting and learning SWH

All partners agreed that forest owners, collectors and policy makers have a high interest in promoting sustainable wild harvesting (Figure 5):

- Forest owners: promoting sustainability among wild harvesters is a way to reduce or to avoid the potential negative impacts on private/public forest due to wild-crafting (e.g. fire risk due to abandonment of non-marketable plant material after collection). Also, SWH could be a way to reduce costs associated to forest management.
- Collectors: interest in promoting SWH depends on the collector (opportunistic or well-established). Well-established collectors should be more interested, due to SWH allows maintenance of resources and long term profit. Opportunistic harvesters should be less interested in promoting SWH, since they should loss profit in their short-term perspective. Thus, it is important to know well the expectations and way of live of harvesters.
- Policy makers: promoting SWH is the way to improve the conservation of species and habitats while complementary profit from forest may be generated. In the long term, promoting SWH may improve public awareness on conservation issues and, thus, less investment in control measures and specific regulations may be needed.

Wholesalers were considered in general as not interested in promoting SWH, since it was said that they think only in their short-term profit and SWH usually means both higher costs and lower volumes that can imply higher prices of raw material. In case of companies and consumers, there was not a general common opinion among partners, although the interest in promoting SWH seemed as intermediate-low.



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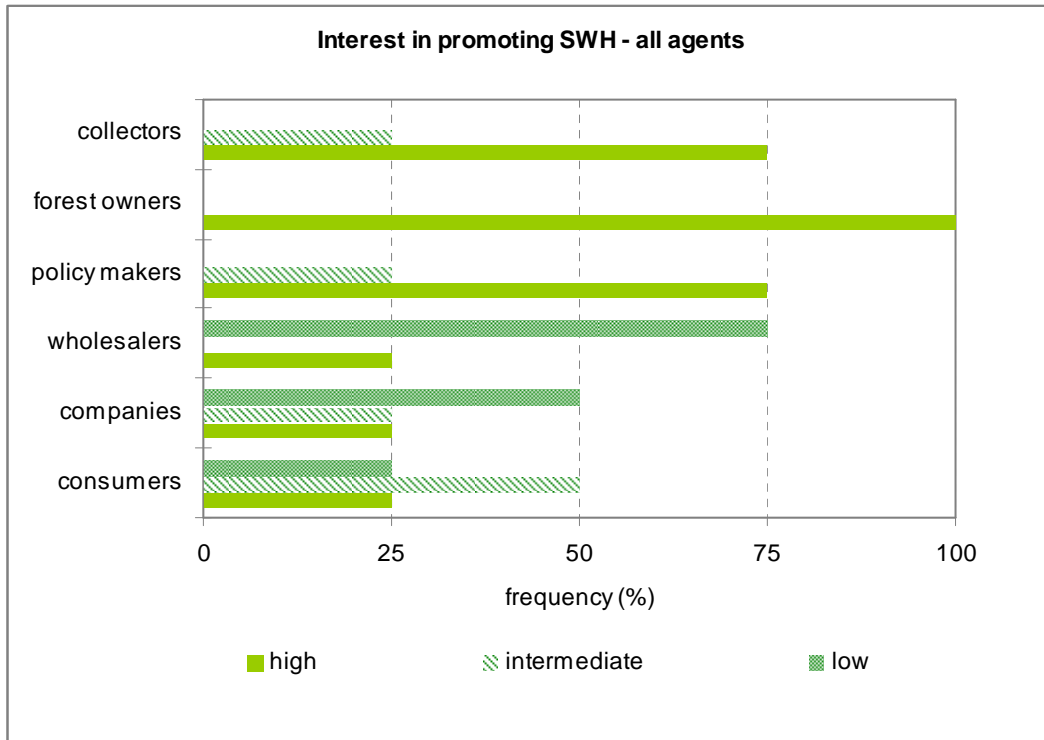


Figure 5. Interest in promoting sustainable wild harvesting, by stakeholder.

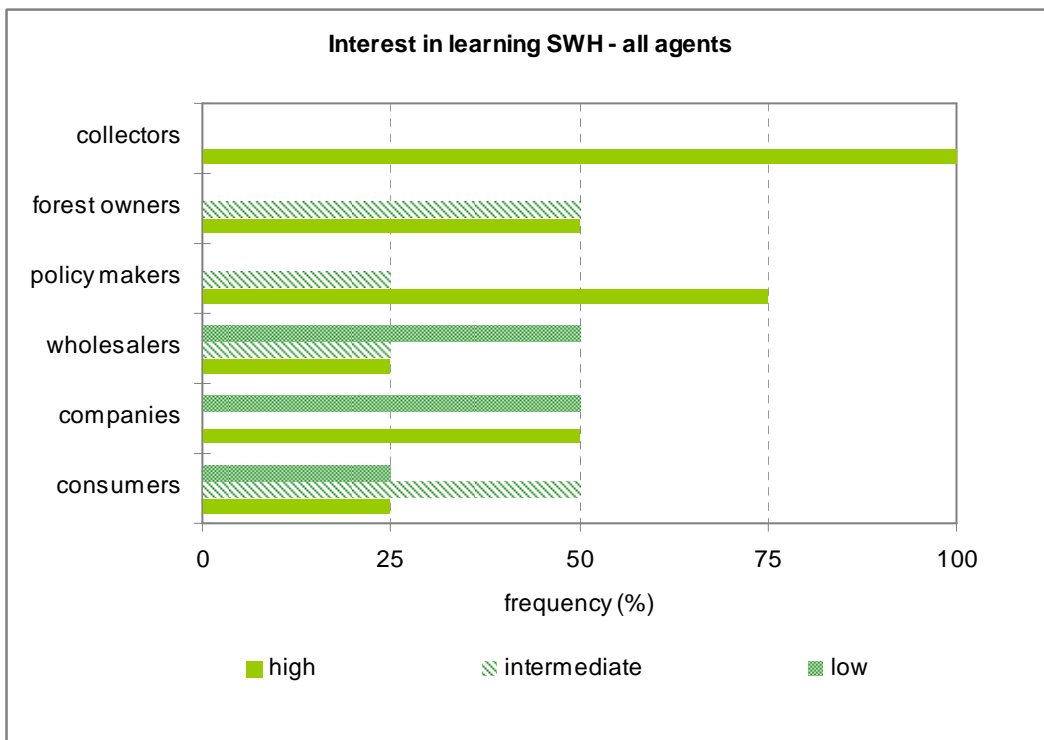


Figure 6. Interest in learning sustainable wild harvesting, by stakeholder.



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In the other hand, collectors and policy makers were considered by all partners as the most interested in learning SWH (Figure 6), for the same reasons as in case of promotion.

For the rest of stakeholders, different opinions were argued and there was not a common thinking among partners.

Forest owners were considered to have both intermediate and high interest in learning, since some forest owners may have a direct profit from SWH, but some of them have not.

Wholesalers and consumers in general were considered to have a low-intermediate interest in learning on SWH. Only one partner considered these stakeholders to have a high interest in learning.

In case of companies, there was not any agreement: 2 partners argued a low interest and the other 2 partners, high interest in learning SWH.

Main factors affecting the SWH implementation

Three main factors that could have an effect on the SWH implementation were defined previously in the questionnaire: conservation issues, economics issues and social perception. As well, an open-category was defined ("other"), in case of a partner considered other key factors.

Each partner was asked to give the opinion about how could affect each defined issue in the implementation of SWH, that is, if each issue was an advantage or a disadvantage for implementing SWH.

As a result (Table 9), all partners definitely agreed that all issues were advantages in the implementation of SWH. Only half of partners considered also that social perception may be a disadvantage in the implementation of SWH, since it is still thought by many people that wild harvesting is related to a non-sustainable activity and to a threat to conservation of species and habitats.

On the other hand, economic issues were also pointed as a disadvantage by one partner, since SWH may lead to higher cost only compensated by the creation of a quality certification or by increasing the added value of the final product.

One partner defined "Traditions" as a factor that could affect negatively to the implementation of SWH. SWH may involve new harvesting techniques that may be not assumed or accepted by local collectors in the short term, who are used to gather in their own traditional way.

Table 9. Opinion about the effect of main factors affecting the implementation of SWH. Results in % of partners.

	Conservation	Economics	Social perception	Other: traditions
Advantage	100	100	100	--
Disadvantage	0	25	50	25



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Partners' interest in adult training on SWH in the future

Economic activities based on sustainable wild harvesting (SWH) would not be a real opportunity without training and promotion among all stakeholders. Sustainability is not still implemented in the current wild harvesting sector in any of the partner countries.

Facing this, all partners agreed that training and transfer is the only way to go forward on the implementation of SWH. Thus, all partners were interested in the future adult training on SWH.

Conclusions

1. In all four countries there is a strong tradition on gathering herbs and other non-wood forest resources (e.g. mushrooms and berries)
2. Cultural tradition, socio-economic issues and natural or anthropogenic impact on the environment (e.g. forest fires, habitat loss, species depletion) in each country determines the way that it is understood the activity of wild harvesting of plant resources, and, consequently, monitored, regulated and controlled.
3. In general, wild harvesting is seen as a threatening activity itself, due to some cases of overexploitation with a high visual impact on the environment and real damage in the species conservation. However, wild harvesting implemented in a sustainable way could contribute to maintain, or even improve, the species conservation in the long term.
4. It is needed to raise awareness on the perception of wild harvesting among society, identifying it as a positive measure for improving the sustainable management of the environment and the resilience of rural economies.
5. Existing laws are addressed mainly to conservation issues of the most endangered species, which not always have a commercial interest. Wild harvesting of not-protected plant resources sometimes fall into illegality since it is got round within the legal framework, which is weak and not clear.
6. As an example, in Lithuania wild harvesting is a very common and well-accepted activity and the perception tends to be positive regarding conservation issues. This situation involves a quite clear legal framework, with even technical issues such as the harvesting rate and the return period being determined by law for the most important species.
7. It is difficult to establish the line between commercial and non-commercial wild harvesting of MAPs. Some species are collected for commercial purposes (mainly traditional and local market) but in very few quantities, so neither volumes nor values are registered in official statistics.
8. Statistical register of annual volumes of marketed MAPs follows a different pattern in each country, which leads to a difficult data comparison. While in Lithuania official statistics exist since 1997 and data are registered annually for all commercial species, in the other countries, data regarding annual volumes are inconsistent, irregular and even do not exist for some years.
9. In order to assure the sustainability of commercial activity, wild harvesting should be managed by local communities, who are the most interested in conserving their own habitats and species in the long term.
10. In all countries the most common certification of wild-crafted products is the organic certification, which mainly guarantees that herbal products and their derivatives are free of contaminants. FairWild Standard is a set of rules established at international level that acts as the only one available for certifying sustainable wild harvesting of medicinal and aromatic plants. No initiative has been yet certified by FairWild Standard in any of the partners' countries.



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11. Although it is depending on the country, in general can be said that very few adult regular training activities had been done in the last 5 years. Most of the training actions are in the form of voluntary courses or workshops.
12. Lack of available data on ecology, distribution and conservation status of the species probably difficult the implementation of high technical training.
13. The general perception by all partners is that there is a lack of training activities or they are not enough for raising society awareness.
14. All partners agreed that all stakeholders are important to be trained or, at least, informed on wild harvesting. However, most of the partners considered only collectors, forest owners and policy makers as key agents when wild harvesting must be improved with sustainability topics.
15. Policy makers are important to be aware since they can decide on laws and implement them to better control potential negative impacts of wild harvesting.
16. Optimal training actions for collectors and forest owners are face-to-face courses or workshops and technical documents.
17. In case of policy makers, all partners consider only media actions as the optimal way to reach them. Other actions that could be important are technical and divulgation documents.
18. Besides awareness and training on sustainable wild harvesting, other measures might be consider to improve conservation of wild plant resources, such as on farm conservation (protection of threatened plants in their natural habitats while taking into account social and cultural factors such as farmers' knowledge) and *ex-situ* conservation.