

**A Road Map for innovating NWFPs value chains
for the
Aromatic and Medicinal Plants iNet**



**Conclusions issued from the Scoping seminar – 27 & 28 June 2018
of the
Innovation Networks of Cork, Resins and Edibles in the Mediterranean basin
project**

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1. Introduction to the innovation networks (iNets)

1.1. INCREDIBLE project overview

Mediterranean forests are facing significant challenges at many levels. In the northern Mediterranean, rural abandonment leads to a rapid expansion of unmanaged forests and increased risk of catastrophic forest fires. In the southern and eastern Mediterranean, rural and peri-urban populations are putting pressure on forest resources. The lack of well-developed forest products value chains that can generate jobs and income can be seen as a common underlying factor that jeopardises the capacity to sustainably manage forest resources already menaced by climate change. Non-Wood Forest Products (NWFP) can be part of the solution, if they can contribute to a smart and inclusive bio-based economy that can create value from and investment streams for sustainable forest management. Developing existing potentials requires the collaboration and knowledge exchange between NWFP practitioners and scientists, and among regions. The INCREDIBLE project is designed to speed up the flow of credible, salient and useful knowledge from science and experience, in order facilitate innovation to happen.

Interregional Innovation Networks (iNets) are the core tool of the INCREDIBLE project to promote knowledge exchange on NWFP across the Mediterranean basin. These networks will allow to seed, collect, co-create and disseminate relevant technological, economic, innovative and research knowledge linked to the main NWFP value chains. iNets are innovation networks where individuals meet to bring forward and co-create knowledge on selected topics. While being interregional in their structure, iNets will be actively working at the local, national and international scales in terms of dissemination outputs and activities.

INCREDIBLE has developed five iNets for the main Mediterranean NWFP: cork, resins, aromatic and medicinal plants, mushrooms and truffles, and wild nuts and berries, to better process the issues of NWFP across the Mediterranean basin. Each iNet will aim to gather the best practical and science knowledge related to NWFP production, transformation and trade channels. Special attention will be drawn to cross-cutting sectorial issues.

Within the iNets, the goal is to achieve and implement innovations through the project. The project concept is to identify challenges and needs in practice for each iNet and explore methods to address them by creating the competences and contributions of many various actors within the iNet ecosystem. The innovations in this context have to be interpreted like an innovation process in which actors from different organisations participate on its creation. Key to this is successful stakeholder engagement, allowing the various actors of the iNet ecosystem to be involved and to be a part of the innovation process.

The participation of stakeholders relevant to the iNet regional ecosystems in the discussions and decision-making process is the best way to ensure that their own perspective and knowledge contribute to the project's outcomes. Stakeholder participation not only results in a better narrative with a richer picture of the iNet challenges, but also allows to better expressing the innovation objectives and the options to reach these goals. Successful outcome also requires dealing with barriers to the implementation of the innovation. These barriers will be discussed and explored during the activities of the iNet.

1.2. Aromatic and medicinal plants iNet narrative

Aromatic and medicinal plants (AMP) products are widely used in the perfume, cosmetics, food and pharmaceutical industries. These different market segments are very different in terms of

value chain actors, volumes traded, relevance of national or international markets or quality requirements. While some plants or their extracts are cultivated, there is still a very significant portion of wild aromatic plants that are collected in forests and scrublands. Some of the wild plants more commonly traded for are lavender (*Lavandula* spp.), everlasting (*Helichrysum* spp.), sage (*Salvia* spp.), laurel (*Laurus nobilis*), myrtle (*Myrtus* spp.) and rosemary (*Rosmarinus officinalis*).

The AMP iNet the focus is on wild plants that make essential parts of Mediterranean forest/scrublands ecosystems. Often, they grow on the most degraded lands, and hostile conditions, unsuitable for classical forest or agricultural production. Despite their natural resilience to harsh environmental conditions, they are affected by climate change and can be affected by unsustainable harvesting levels and/or procedures.

There is an increasing interest worldwide in aromatic and medicinal plants as natural medicinal remedies, for their use in thermal treatments and as ingredients for natural cosmetics. This global trend is reflected in a growing demand for AMP products in the European markets that are becoming more sophisticated and demanding in terms of quality of products and reliability of supply. Other requested attributes are sustainability, social equity and wildness. They are becoming highly demanded in at least some high added-value market segment. All actors in the AMP value chains are increasingly required to address consumers' expectations (e.g. in relation to traceability, development of niche products) while also facing changes in consumer preferences, and increased global competition. Some high demanding sectors (e.g. perfume and cosmetic industries) are stretching to the limits the capacity of producers to supply essential oils based on wild-collected plants in quality, quantity and price. This rapidly evolving market situation and the menace of climate change pose significant challenges and opportunities for resources managers, collectors, processors and distributors.

2. Scoping seminars

The scoping seminar was the first official meeting of each iNet. Its main goal was to create a specific road map for better targeting specific issues within its topic. Five seminars were organised by the iNet coordinators and they were held in Tunisia (Aromatic and Medicinal Plants), Spain (Resins, Mushrooms and Truffles), Portugal (Wild Nuts and Berries), and Italy (Cork). All iNet members were invited and a special attention was given to ensure the participation of key stakeholders. At the scoping seminar, stakeholders had an opportunity to validate previous work, to propose bottom-up, complementary activities and to contribute to the iNet future development.

The main objectives of each scoping seminar were:

- to validate the narrative, and to establish a road map for the development of the iNet. The object was to focus on the themes that will be addressed throughout the project,
- to manage expectations on what can be achieved,
- to give participants opportunities for networking.

At the scoping seminar, stakeholders gathered from all links of the value chain had an opportunity to share their opinion and bring up problems and difficulties of their sector. This was a unique chance for everyone to learn about challenges and to get a wider picture of the condition in the sector. Most of the stakeholders were from the country where the scoping seminar was organised but international stakeholders were participating too. It was interesting to local stakeholders to learn and compare the difficulties, qualities and solutions in other countries.

The number of stakeholders attending scoping seminars (Table 1) was higher than expected (targeted number was 30) in three of the events, which tells us that the stakeholders were well informed and interested in collaboration. Despite the different concerns among participants from different countries, and even among regions in the same country, the participants agreed on the identification of challenges as well as the priority themes for reinforcing the NWFP sector.

	Cork iNet	Resins iNet	Aromatic and medicinal plants iNet	Mushroom and truffles iNet	Wild nuts and berries iNet
	Number of participants				
Spain	1	28	4	48	4
Portugal	4	7	1		15
France		3	2	2	1
Belgium	1	1	1		
Greece			1	2	
Italy	20			2	
Croatia				2	
Tunis	1	1	37		
Total	27	39	46	56	20

Table 1. Number of participants at each scoping seminar.

Per iNet, this chapter summarises:

- the main outputs from each Scoping seminar;
- the improvements that this event brought to the value chain map (improved description or addition of new stakeholders and fluxes), and

- the priority themes on which the INCREDIBLE project should focus, those that would have a bigger positive impact on the value chain.

2.1. Scoping seminar report of the Aromatic and medicinal plants iNet

2.1.1. Summary output

The Aromatic and medicinal plants (AMP) scoping seminar was held in Tunisia with the participation of various stakeholders coming mainly from Tunisia, Greece, Spain, Portugal and France. The results of the evaluation form confirmed the success of the seminar, with 38.1% of the answers rating the seminar as very good and 52.4% rating the seminar as good. All actors of the AMP value were represented in the seminar, for instance: producers, government agencies, researchers, NGO, exporters, etc.

The seminar was launched by three presentations to introduce the actual situation of AMP sector in Tunisia, Spain and Greece. These presentations were very inspiring to open the debate. Various exercises (SWOT analysis, value chain mapping, etc.) were employed to better characterise actors and fluxes in the value chain and to prioritize key themes to focus INCREDIBLE actions.

Participants were eager to join the AMP iNet and to present input for this scoping seminar. During the working sessions, each group of participants was heterogeneous to be representative of all key stakeholders.

Four key themes were identified by the end of the seminar:

- supporting production and marketing capacities;
- natural resource management and biodiversity conservation;
- legal framework adjustment;
- certification and traceability.

2.1.2. Description of new/better characterised actors and fluxes in the value chain

Aromatic and medicinal plants value chain consists of plant products used in the perfume, cosmetics, food and pharmaceutical industries. AMP in the Mediterranean region (Spain, France, Tunisia, Greece, Croatia, Portugal) can be based both on wild and on cultivated plants. This iNet focuses on wild plants which are still dominant in several market segments and that poses specific challenges in relation to supply arrangements and in relation to scale up beyond local and more or less informal markets.

INCREDIBLE project started understanding the functioning of the value chain and identifying the main actors involved in its large ecosystem (Figure 1). Relevant actions can rely upon individuals and institutions not directly involved in the material flow, transformation and placed into market. From there, main threats and opportunities for resource managers, collectors, intermediaries, first processors, industries and potential entrepreneurs are analysed.

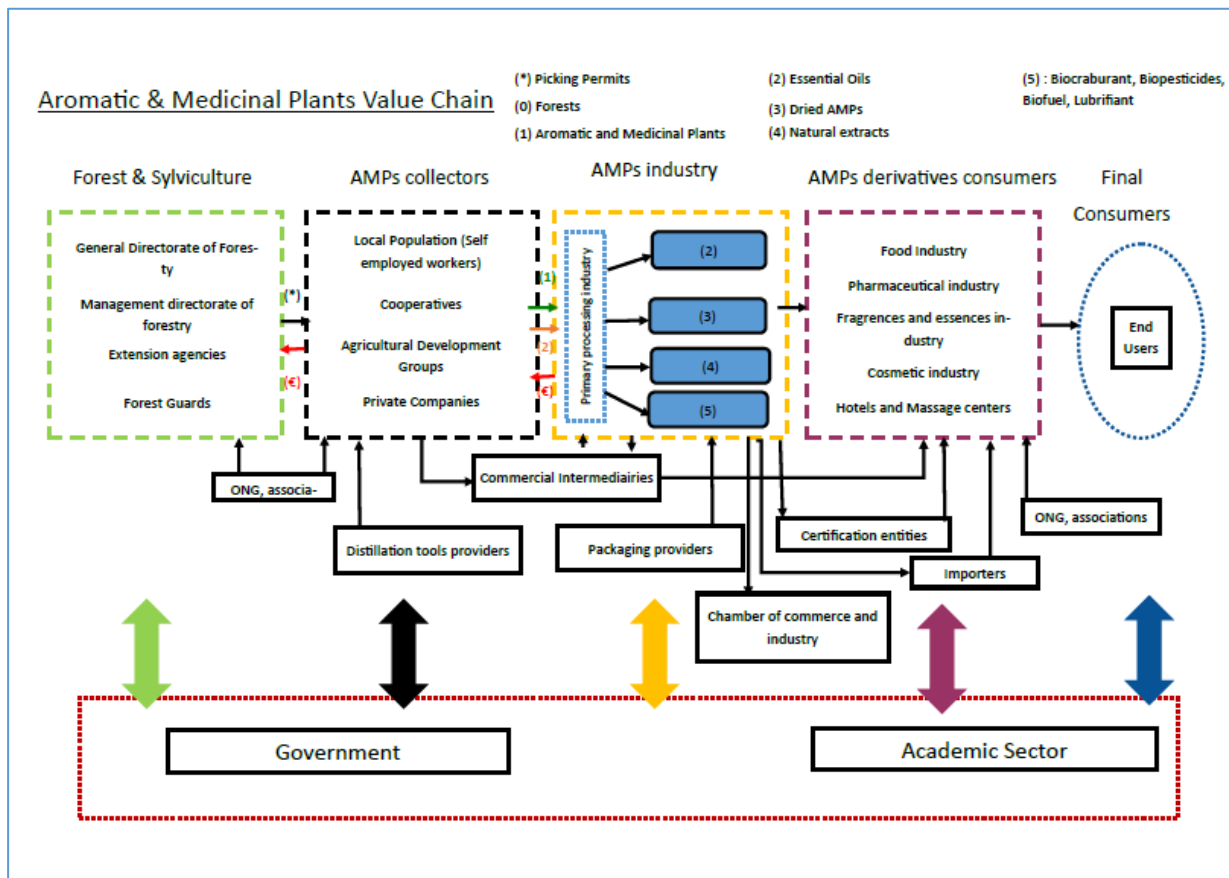


Figure 1. Reviewed aromatic and medicinal plants value chain map.

The AMP value chain involves three levels of actors:

AMP collectors: they harvest vegetal material from forest areas. This group includes local population (self-employed workers), cooperatives, agricultural development groups and private companies. This actor is considered as the main stakeholder in the value chain and should be sensitive to biodiversity conservation by applying conservation practices.

AMP industry: this category includes processors, firms and small distilleries that convert vegetal material into essential oils, dried aromatic and medicinal plants, natural extracts, etc. In addition to AMP harvesting, local population and development groups can also sell essential oils and dried plants to large firms.

Public authorities: in Tunisia, where forest are publicly owned, public authorities intervene in all the links of the value chain. AMPs are placed under the control of the Ministry of agriculture. Indeed, collecting AMPs fell under regulation of forestry, hunting permits and timber products. The first step to collect AMPs in forest areas is to obtain an “authorisation” or a permit from this ministry.

The AMP value chain is characterised by the informal nature of its upstream base (collectors without permits) and it is better organised and has more formally structured stakeholders downstream (processors, wholesalers and retailers). Summing up, the value chain operated with little vertical integration and almost few horizontal collaborations. Collectors have limited access to end-market information and obtain low benefits in comparison with other actors and are the

least integrated in the value chain. Moreover, interaction between researchers (academic sector) and processors is almost absent to valorise research outputs.

2.1.3. Priority themes to focus INCREDIBLE actions

INCREDIBLE project actions should be oriented around four key priority themes:

NATURAL RESOURCE MANAGEMENT AND BIODIVERSITY CONSERVATION

The AMP sector's livelihood depends on sustainable management of vegetal material. Wild plants are susceptible to overharvesting and collectors seek to maximize quantity (and therefore income) in a short period. In many countries, there exists good practices manuals or recommendations for plant harvesting. However, there is a general lack of useful approaches to estimate, determine and monitor sustainable harvesting levels.

The important economic value of AMPs is not translated into incentives for sustainable management, much less biodiversity conservation. There is no incentive to improve harvesting behaviour. These initiatives should involve, be led by and be implemented by downstream value chain actors.

Biodiversity is an important resource in the search of new products. The Mediterranean region's rich biodiversity favours it as a source of innovation. Participants in the scoping seminar indicate that the greatest incentives for conservation of biodiversity can come from bio prospecting. Diverse plant species that present new opportunities for firms are still unexploited. Participants mention that botanical and agronomic research needs to focus on identifying and optimising AMP production and value-added opportunities.

ACCESS TO THE RESOURCE AND LEGISLATIVE FRAMEWORK

In the case of Tunisia, production is mostly coming from lands controlled by the State: resource use rights and harvesting of aromatic and medicinal plants are subject to a public tender (Article 18 of the Tunisian forestry code) organised each year by the Tunisian Forestry authority for the private firms to collect plants. A rigid legislative framework can be a handicap to access the natural resource (as product resource). In France, on private lands, collectors reach private one to one agreements with landowners for accessing the resource. In some cases, collection rights are auctioned, as is the case of regional parks in Andalusia (Spain). The existence of this large variety of models and their differential benefits/constrains for the actors involved in the supply chain are not well documented.

TRACEABILITY

Traceability was mentioned as one of the most priority themes in the AMP sector. The adoption of geographical indication or designation of origin is seen as indispensable for more consistent quality control and development of standards. Setting up geographical indications is considered a very useful method of indicating the origin of goods and services. Participants indicate that a geographical indication must be available for use by all producers of essential oils in that region, for instance small producers and local population. Indeed, using a certification mark is sometimes restricted to big producers and processors who comply with the established standards for its use. Participants mention the importance of a geographical indication for certain products and they explain that certain plants owe their special qualities to the place from which they come.

SUPPORTING PRODUCTION AND MARKETING CAPACITIES

Essential oils production is constrained by price variability on international market, continuity of internal supply and quality concerns. Export markets for essences and essential oils have very high requirements in terms of supply quantities and qualities and there is a reduced number of very well established operators. Outside mayor perfume and cosmetic houses there is myriad of opportunities not always well understood (e.g. natural cosmetics, thermal treatments, etc.).

Entrepreneurs lack of information and access to domestic and international markets. Is important for them to understand new trends in major consumer markets and the related quality and traceability requirements. In addition, in northern Africa, AMP could play a larger role in rural economies. However, the sector suffers from a lack of access to finance. Indeed, the sector is perceived as too unpredictable and highly risky by the formal banking system and the micro-credit sector. Local population and small processors are excluded of the banking system. Donor projects from NGO are the unique sources of external liquidity and funds for this category of producers (local population and agricultural development groups).

3. Discussion and findings

3.1. Overview

In the period from 8th of May 2018 to 12th of July 2018 five iNet scoping seminars were held in Spain (two), Portugal, Tunisia and Italy, with the total number of 184 attendees, coming from different backgrounds, positions in the value chain and also diverse interests and expertise. They included land owners and managers (both public and private), government officials, collectors, processing industries and retailers of different sizes, industry and retail associations, intermediaries and service companies (e.g. nurseries, consulting, etc.), researchers and technicians from various disciplines and, finally representatives of boundary sectors, as hotel and restaurants. In general terms, the biggest interest on the scoping seminars was found among the industry/trader representatives (29% of the attendees; Figure 2) and private and public forest owners and managers (20%) and the research community (12%).

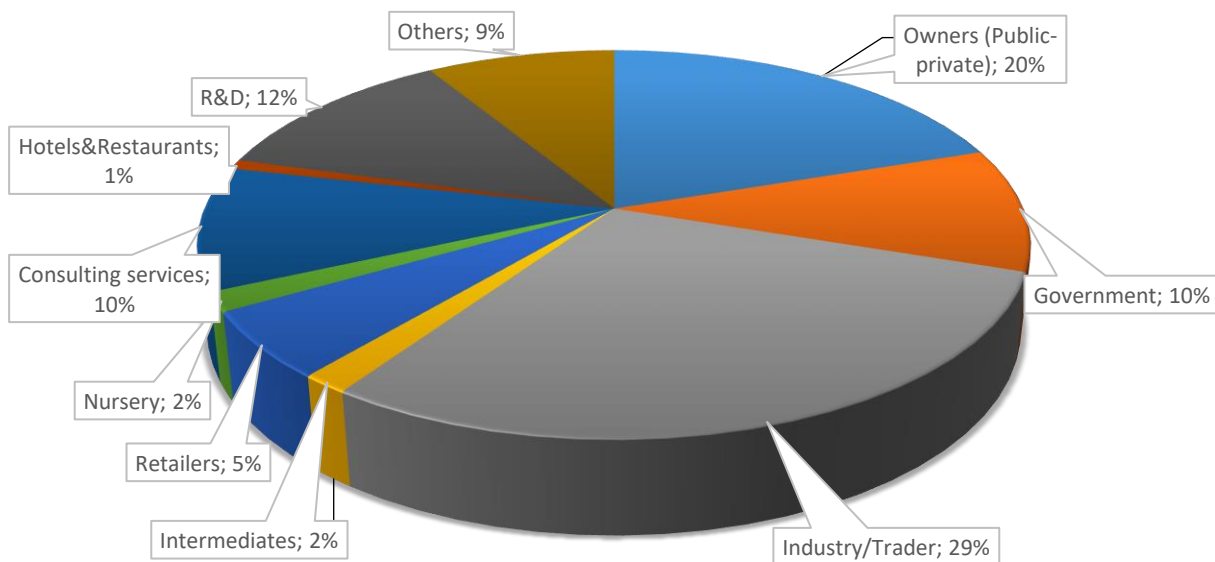


Figure 2. Percentage of attendees from all scoping seminars grouped by their value chain position.

This scoping seminars were aimed at better understanding the most relevant needs and opportunities for innovation and strengthening the respective value chains. The methodology was based on a combination of plenary, break-up groups and informal discussions during coffee breaks, lunch and fieldtrips. Starting point of all discussions was an understanding of all the actors and fluxes involved in the different value chains and their extended ecosystem. There was no attempt to generate consensus on a desired scenario for every non-wood forest product sector, as this could lead to roadblocks due to diverging interests among different actors of the value chains. The objective was rather to develop a collective assessment of the functioning of the value chains and the identification of challenges or opportunities, as perceived by the different actors. As expected, this approach facilitated an extensive discovery of themes and topics, the identification of new or better characterised actors and fluxes in the value chain. Similarly, no hard prioritising was sought although, in some cases, participants were asked to vote

priorities as a tool to stimulate discussions. The methodology was designed to rather capture all issues and priorities, and to further process and distil them in an iterative approach, to better understand them and to allow common priorities to emerge naturally.

Successful completion of the scoping seminars proved that the chosen methodology fully meets the expectations of project outputs. High rates of stakeholders and individual responses to join the scoping seminars is just one of the indicators. More important, the results of scoping seminars revealed precise problems, needs, expectations and possible solutions for problems in each of the five iNets. That clearly indicates that the project topic is highly relevant for the European NWFP sector as it is for the overall development of rural communities across Europe.

3.2. Innovation challenges in non-wood forest products in the Mediterranean region: common themes across iNets

Since the different NWFP are collected, produced, processed and marketed in different social-ecological systems (as a consequence of divers biophysical, socio-economic, technological and cultural aspects), different priority themes arose at each iNet scoping seminar. The analysis of the outcomes, however, shows common knowledge gaps and challenges for innovation. The identified cross-cutting themes are described below.

LONG-TERM AVAILABILITY AND SUPPLY OF NWFP IN A CONTEXT OF GLOBAL CHANGE

Understanding and mitigating the impacts of climate change

Climate change is recognised as a major threat to all forest ecosystems and is predicted to have especially intense impacts in the Mediterranean region. Higher temperatures and reduced precipitation will directly affect the composition, structure and productivity of forest ecosystems and thus, of non-wood forest products. How this will affect the production of NWFP and what are the options to mitigate this impacts is an area that needs research and knowledge transfer. While agronomic practices can be adapted for domesticated products (e.g. irrigation in truffle or chestnut), mitigation options for wild NWFP are less evident. The same can be said for emergent pests and diseases. Climate change can also affect the length of the production/collection period and increase the inter-annual variability in production, hampering the development of the value chains. In some cases, the impacts of climate change can be exacerbated by human activities. For example, irrigation of agricultural crops can reduce underground water availability for nearby forests, thus jeopardizing also the production of NWFP.

Sustainable production and harvesting

In the case of many wild NWFP, sustainable harvesting levels are not well understood. The condition and availability of the resource is not regularly monitored nor evidence-based harvesting levels are estimated or enforced. This situation can become critical as market develops and demands increases. Also because intense harvesting can concentrate in the most accessible areas. What would be the impact of increasing mushroom picking in long-term production? What is the impact of using rakes to increase harvesting by professional pickers instead of the traditional picker knife? What will be the long-term availability of rosemary for wild collection in a context of high picking pressures and climate change? How much resin can be produced in southern Europe under plausible climatic and social scenarios? How can NWFP primary processing industries can forecast their investments with such uncertainties? In some

cases, the lack of knowledge on future resource availability difficult rational business and policy decisions.

In the case of more domesticated products, there are still significant knowledge gaps in relation to, for example, genotype x site interaction for relevant characteristics as it can be cork quality in cork oaks stands or kernel productivity by stone pine groves. Management of pests and diseases are also a critical issue that requires increased knowledge generation and transfer. In all domesticated crops, optimization of irrigation to improve yields, quality and economic return with maximum efficiency is also a very relevant area (e.g. truffle, cork and stone pine).

UNSECURED AND IRREGULAR SUPPLY

There are also critical socio-economic challenges related a stable and secure supply of NWFP. Supply of forest products depend on individual non-professional collectors (mushrooms, wild truffles, some aromatic plants) and sometimes on professional crews working for periods, with inadequate labour conditions and limited knowledge on the sustainable collecting practices (mushrooms and AMP mainly). In some cases, there is lack of workers due to hard working conditions and relatively low income as it can be the case for resin and cork in high-income regions. This situation makes difficult the creation of stable value chains and in some cases limits the market expansion in well established industrial activities (cork, resin, some essential oils).

For all widely collected products, there is inadequate knowledge on the size of the market and its economic relevance. Black and grey markets are very important and there is a generalised lack of traceability. This, consequently, favours black and grey markets and also robbery, as in pine nuts, and the concurrence with uncontrolled substituting products from other regions (e.g. pine nuts from east Asia, mushrooms from Russia, etc.). The lack of traceability can have especially negative effects for those products used as food, in cosmetics and related to human health. New business organisations, improved or adapted regulation and registration of collectors, or mobile ITC are some of the promising innovations, either social or technological, that can help tackling some of these issues and that could be adapted and adopted more widely. However, firstly, challenges should be better understood.

REDUCED PROFITABILITY

The situation described above is partially related to the tight profitability of NWFP production and collection. Most of the wildly collected or only partially domesticated NWFP analysed in the different scoping seminars have limited capacity to generate sufficient income for producers (private forest owners, forest municipalities, etc.) or for collectors (resin tappers, AMP collectors, etc.). This is a structural weakness that in some cases almost totally prevents the development of NWFP business activities or that jeopardises its future. This is especially true in countries or regions with a high average income and explains the almost inexistent resin or cork production in France, or the incapacity to mobilise cork from the forest to meet the existing demands as it happens in Catalonia (Spain). Some social, managerial and technological innovations can help in improving NWFP production and harvesting profitability. These are related to mechanisation (e.g. pine nuts or chestnut collection, cork debarking, resin tapping), to harvesting methodologies more adapted to the socio-economic context (e.g. borehole resin tapping in timber-oriented stands), to silvicultural or agronomic practices that increase productivity (e.g. improved genetics, forest management practices that improve mushrooms yield, truffle plantations irrigation), to logistics, etc. Evidently, the development of high added-value products based in NWFP is a necessary

condition to maintain and improve the profitability for producers and collectors, although it does not guarantee equity and fairness within the value chain. At the same time, the recognition of the positive externalities produced by the NWFP production, as through PES schemes, is seen as a strategic component on the economic viability of, at least, cork and resin value chains.

In some cases, producers or collectors have weak bargaining power in relation to the primary processing industries and they are not able to get a fair compensation, or they feel so. In other cases, processor cannot mobilise the resource because they cannot meet the expectations of producers that may have unrealistic views on the market value of their products, as it can happen in cork. Improved awareness on market functioning, transparent and widely recognised procedures to measure quality or public price observatories can reduce tension within the value chain, along with contractual arrangements and new forms of collaboration among producers/collectors.

ACCESS TO THE RESOURCE

Across the Mediterranean region there is a large diversity of forest tenure regimes and different regulations on who and how can access wild resources. Free access to forest and the right to collect NWFP for all citizens irrespective of tenure is rooted in many countries. However, the risk of overexploitation or the need to manage conflicts between recreational collectors and professional collectors are fuelling the adoption of new regulations.

LACK OF AWARENESS OF CONSUMERS, POLICY MAKERS AND SOCIETY AT LARGE

The lack of awareness of the economic, social and environmental benefits that NWFP production provide is common among all five NWPF; for those that reach the consumer highly transformed (resins and AMP) as well as for those that are easily recognisable by end-users when eaten (mushrooms and truffles, nuts and berries) or used (cork). The lack of awareness is of different nature depending on the NWFP: knowing the origin of the product or the ecosystem services its production provides, being able to distinguish between a given product and its substitute, or simply identifying that a NWPF (or its derivatives) enter in the composition of a manufactured good.

In this case, the challenge is related to marketing. Already existing tools to tackle this challenge are marketing campaigns, product traceability labels and regulated geographical indications or designations of origin.

3.3. Cross-cutting areas for action

On the one hand, climate change, globalisation, urbanisation, tertiarisation are megatrends affecting the development and sustainability of non-wood forest products and explain to a large extent the challenges identified. Competition in the global markets with other producing countries and with alternative products put high pressures on profitability of raw materials (e.g. pine nuts, cork, resin, essential oils). Rural abandonment makes difficult to find labour. All this favours black and grey markets for products and labour to reduce costs. On the other hand, the emerging trends represent new, even immense, opportunities. Nature-based and experiential tourism, green care, societal preference for natural cosmetics and natural food are experiencing and increasing demand. The need to replace oil-based or non-renewable products with bio-based solutions in creating a new market pull for manufacturing and construction (cork or resin and other plant-based chemicals). Facing challenges and making the best of emerging opportunities

requires concerted action of diverse actors in multiple directions. The outcomes of the Scoping seminars allow us to highlight three domains that require specific attention as they can provide the necessary conditions for sustainability and innovation to happen.

BETTER FOCUSED RESEARCH AND IMPROVED KNOWLEDGE FLOWS

Research, development and extension capacities are very different between Mediterranean countries and there is much to be learnt from cross-regional cooperation. Some countries had a long tradition of using NWFP. The lack of research is often related to insufficient number of specialised researchers for some NWFP, non-existent financial and/or development programs to implement specific projects and the lack of interest from political and governmental structures. Research capacities are fragmented across countries and among institutions within one country. In the case of cork and wild nuts, there are different field trials, not always connected to each other, despite being highly complementary. Sometimes in-house research produced by companies (e.g. resin stimulants, new resin tapping technologies, etc.) is neither published nor disseminated. Usually, across the region, support for NWFP research and rural innovation is weak.

IMPROVED GOVERNANCE

Having better, stronger, more comprehensive governance frameworks for NWFP should allow for better decision-making by all actors, should facilitate stronger and more equitable value chain arrangements and contribute long-term social and environmental sustainability. Institutional arrangements and public regulation varies from country to country and between NWFP, becoming much weaker or inexistent as we move from fully domesticated products to completely wild products. In general, governance is considered fragmented, confusing, inadequate, limited or totally inexistent by INCREDIBLE project stakeholders.

In the case of wild NWFP, some Mediterranean countries or regions do have a regulation that covers aspects related to collecting rights, access to the resource or permits and taxes. However, this is totally absent in other. In some cases, existing regulation is not helping to facilitate cooperation and transparency inside the value chains or can even represent an obstacle for collection, production and trade. As an example, forest or environmental regulation, or the way it is interpreted by the competent authorities, can limit the establishment of new truffle plantations in forestlands in central Spain. Across the iNets, the need to overcome this problem is recognised as one of the most important. In the case of edibles, regulating quality, forest to fork traceability and allowing for effective protection of origin is a specific challenge.

Governance approaches, arrangements and procedures by private (e.g. companies) and other non-governmental actors (e.g. forest certification entities) are much less known. Formally adopted good practices codes or due diligence systems among collectors and processors are generally missing or have not been yet identified and properly described. Some NWFP are covered by sustainable forest management certification schemes (e.g. cork in PEFC and FSC), although they might not be generating the added value that could be expected or desired.

Addressing these and other related issues (market and environment, plant health regulation, incentives and PES schemes, irrigation rights, etc.) will greatly benefit from more structured public-private cooperation.

MORE EFFECTIVE COMMUNICATION FOR GREATER SOCIAL AWARENESS

When sustainably managed, the production, collection, and transformation of NWFP can generate multiple positive externalities: rural development, forest fire prevention, climate change adaptation and mitigation, etc. However these benefits are rarely recognised in the markets, where Mediterranean NWFP compete with petroleum-based counterparts (e.g. petroleum derivatives, plastic stoppers, etc.) and with imported products that can differ in quality and environmental performance (Asian pine nuts, Russian mushrooms, etc.). Stakeholders across the iNets are convinced that it is extremely important to increase the awareness about the current situation and existing potential for NWFP and the environmental, social and economic benefits that they can provide. Product, environmental and geographical certification schemes are seen as promising tools.

On the one hand, the actors in the value chain could better communicate outside their sector. On the other hand, the need for better communication along the value chains (between producers, processors, market and government) is clearly identified by the stakeholders. Between different stakeholders, there are different communication problems. Depending on the region or the country, the problems are identified as:

- reduced information flows between producers/collectors, traders and transformers;
- lack or not existent knowledge and technology transfer between actors of the value chain;
- lack of cooperation towards potential common goals such traceability schemes, quality assurance, joint marketing and certification;
- lack of awareness by policy makers on the barriers and opportunities for NWFP that translate into fragmented, inadequate or non-existing regulation.

Consequently, better dissemination of information between procedures for quality control and certification methods from certification entities, both for harvesting and processing is needed. For those sectors where we have good practices, dissemination between actors in the value chain should be increased. For the sectors where quality control and certification methods are not established, it is necessary to make a complete analysis and to set up good foundations so certification entities can produce a uniformed method for quality control and certification of every product in each iNet.

4. Roadmap for INCREDIBLE and beyond

The reports from each Scoping seminar are very concise; they perfectly represent the situation on the field and are a good starting point for each future regional or international events organised by the INCREDIBLE project. Adopting new knowledge and ideas to existing ones, spreading the existing discussions and trying to solve the small problems through networking guarantees successful future work of each iNet. The following discussion will try to gather the conclusions and propose next steps for each iNet based on the Scoping seminar reports.

4.1. Aromatic and medicinal plants iNet roadmap

Long-term sustainability, access to the resource, sustainable collecting practices and developing new market opportunities are the key themes so far identified in the iNet discussions.

In Tunisia, the discussion was primarily focused on incentives, quality control, product distribution, and not on the origin of plants. The sustainable management of aromatics and medicinal plants need to be better assessed and discussed. In addition, there is a need to map examples of regulation, access to resource and monitoring from other countries that could offer, in conjunction with local case studies, a starting point for policy changes and their adaptation. Finally, as the AMP iNet focuses on wild plants and it will be important to have good representation of public, communal or private forest owners in the iNet discussions.

Next steps should focus on:

- proposing approaches to define measure and monitor sustainability of wild AMP harvesting and their contribution to multifunctionality of the ecosystems;
- mapping regulation of access to the resource in the Mediterranean, understanding potential policy failures and replicable cases. This should take into account not only the interest of collectors and processors but also that of land owners and managers;
- identifying and documenting relevant cases for traceability and policy and economic schemes to support sustainable collection;
- understanding the opportunities and barriers to AMP domestication for the most relevant markets in different countries, and
- better understanding emerging market trends and market niches outside the global commodity markets, and support entrepreneurship.

5. Annexes

5.1. Access to scoping seminar reports and other materials

- Cork iNet: <https://incredibleforest.net/inet/cork>
- Resins iNet: <https://incredibleforest.net/inet/resins>
- Aromatic and medicinal plants iNet: <https://incredibleforest.net/inet/aromatic-medicinal-plants>
- Mushrooms and truffles iNet: <https://incredibleforest.net/inet/mushrooms-and-truffles>
- Wild nuts and berries iNet: <https://incredibleforest.net/inet/wild-nuts-and-berries>