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New Values of Non-Wood Forest Products

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Abstract: The role of non-wood forest products (NWFPs) in industrialised country economies has declined in the past, but they are generating renewed interest as business opportunities. In a forest-based bio-economy frame, NWFPs can contribute to human nutrition, renewable materials, and cultural and experiential services, as well as create job and income opportunities in rural areas. Applying a service-dominant logic (SDL) approach to analysis of NWFPs, this article aimed to understand how new goods and services are co-created through networks of public and private actors in specific institutional, social, and cultural contexts. This focus sheds light on the experiences associated with NWFP harvest and use, revealing a fulsome suite of values and economic opportunities that include but are greater than the physical goods themselves. Turning the SDL lens on in-depth case studies from Europe and North America, we show dimensions of forest products that go beyond commercial values but are, at the same time, constituent of commercial activities. SDL provides a new view on customer relations, service provision to businesses, and policy measures for innovation support for non-wood forest products.

Keywords: non-wood forest products (NWFPs); non-timber forest products (NTFPs); service-dominant logic (SDL); value creation; innovation; actor networks; case studies; industrialised countries

1. Introduction

Modern forest management systems prioritize market-oriented timber production and tend to neglect other forest goods and services, including non-wood forest products (NWFP) [1–3]. NWFPs, such as pine resin, mushrooms, and herbs, among others, retained some importance when there was an industrial demand of national importance [4,5]. They also kept a role in informal collection for local subsistence uses and supplementary household income [6–8]. Forests have been used by rural communities for various purposes, in which timber has been only one among a range of other commercial and non-commercial goods or services [9]. With increasingly globalised economies, production of NWFPs often declined in industrialised countries when they were not competitive with products from countries with cheaper labour costs, intensified production in agricultural systems, and substitution products of petrochemical origin [10,11]. The very terms "non-wood" or "non-timber" (in non-wood forest products or non-timber forest products, respectively) indicate their secondary role in forest management and policy [12,13], as do other expressions applied to them including "secondary", "side-products", or "niche markets" [14]).

In contrast, the trend towards bio-economy suggests a potential for an increasing role for NWFPs in future forest-based value chains. In a forest bio-economy context, the role of forests is broadened

from timber production to the use of various wood and non-wood materials and provisioning of forest ecosystem services, as well as energy production and materials used in recycling processes [15]. Although the future role of forests in a bio-economy is often primarily envisioned as resulting from cultivated species, industrial uses, and intensive production systems, we argue that NWFPs have and will retain broader commercial and non-commercial roles and deserve greater attention.

There are indications of a revival of NWFPs as a result of various social trends that are creating new demands for wild and natural products, traditional skills and production methods, retro styles, experiential products, and healthy and sustainable lifestyles [11,16,17]. In this context, NWFPs are often specialised custom-made products and are increasingly marketed as well-being products embedded in recreation or educational services or as products that include experiential services such as guided tours, fairs, or events [10,11,16].

Managing for such values would be a significant departure from the prevailing practices of the professional forestry sector. That NWFPs have long and continuous histories of use notwithstanding, marketing in the modern context transforms them into new types of products, even as it may retain and reinforce some of their traditional values. As such they represent innovations in forest bio-economies that, we propose, can be studied from the perspective of value co-creation and service-dominant logic (SDL; [18]) to reveal their full value and characteristics [16,19]. Doing so enables equal consideration of all benefits from forests, including strong connection to consumers [20], bringing into focus important values of forest products that are missed in more conventional analyses of marketing and innovation.

In this article, we used service-dominant logic and a value-based approach to analyse NWFPs. Through in-depth case studies from Europe and North America, we examined networks of actors that co-create value in distinct institutional, social, and cultural settings. We aimed to better understand the full value of NWFPs and how they are developed. We also derived conclusions and recommendations for better support of innovations in NWFPs.

2. Value Creation and Innovation in Non-Wood Forest Products

2.1. Innovation Potentials for Non-Wood Forest Products

NWFPs comprise a wide range of materials for various kinds of uses. Value chains differ between products and may be organised very differently in different countries [17]. In addition, business models for their commercial utilization vary greatly, depending on the type of product and depending on the type and size of land ownership. In spite of these variations, we can identify some common features that characterise their value and that are relevant for business opportunities and innovation. For NWFPs that are collected from the wild or from forests managed for timber, the share of non-commercial picking and the share of small or micro-businesses is larger than for those from plantations or specialised management systems. Picking may be done by land owners or non-land owners, on the basis of licences or everypersons' rights. Collecting, processing, and marketing is often done by small- or medium-sized enterprises. There may be limited incentives for innovation or targeted management because the harvested products do not always contribute to the income of the land owners, for example, when consumers pick for their own consumption or when enterprises pick on the basis of everypersons' rights. Land owners do benefit when they are paid licence fees for picking permits or when they engage in harvesting themselves. They achieve a higher value added when they not only sell the raw product but also process them or even market the final product [17].

A range of standards and certification schemes, such as organic certification, wild products certification (e.g., FairWild), sustainable forest management certification (e.g., FSC - Forest Stewardship Council and PEFC - Programme for the Endorsement of Forest Certification), or certification of socio-economic aspects (e.g., FairTrade) are applicable to these products, and may increase their value. Some schemes are developed by public entities, such as the European Union "origin, geographical indications and traditional specialties schemes". The European labels Protected Designation of Origin (PDO), Protected Geographical Indication (PGI), and Traditional Speciality Guaranteed (TSG), which

protect the name of products that come from a specific region and follow a particular traditional production process. Several NWFPs, such as chestnuts, nuts, mushrooms, and berries have been labelled with these schemes, attesting the EU effort in promoting these products [17].

NWFPs often have the characteristics of territorial goods [21]. Their production is bound to certain areas or places, and they carry strong material of symbolic regional associations, such as a special regional flavour. Although this may limit their production volume, it also provides special marketing opportunities [17,21–23]. When a product is embedded in offers with other goods or services (e.g., in territorial marketing models), targeted governance or marketing strategies such as regional picking licences or marketing labels may be useful or necessary [14,17]. Involvement of consumers in production processes is also gaining importance. Consumer engagement may range from no involvement (i.e., commodity mass markets), to indirect involvement (i.e., territorial and niche products), direct involvement (i.e., experiential products), and personal collection (i.e., for gifts or personal consumption) [11]. An important innovation trend in NWFP is in non-commodity, personalized products [10,17,22]. Examples include high-quality, high-priced, small-scale, and/or manufactured food and drinks; handicraft items; and one-of-a-kind artisanal products. Often, marketing of these products emphasizes non-material symbolic qualities connected with green, healthy, and sustainable standards; local or regional traditions; and hand-made or artisanal production. They have experiential qualities in and of themselves or are marketed together with experiential services such as foraging or mushroom collection tours, wild fruits cooking courses, or handicraft workshops [16]. Marketing, these products and experiences requires largely rural producers' to understand predominantly urban consumers' preferences and value systems.

There are manifold challenges connected with NWFPs. Seasonal availability of the products and interannual fluctuations make systematic development of a business and the development of stable market channels difficult. Property rights are not always clear and can present challenges for business development where the public have the right to collect on public and private land for personal use or commercial purposes [24]. Doing business in the agro-food sector may be difficult for small enterprises faced with increasing sanitary regulations and traceability standards, as well as business and tax rules. In addition, there is limited attention from existing (agricultural or forestry) innovation systems to this business field [2,25,26]. Innovation systems for primary sectors such as forestry typically direct efforts towards rationalisation rather than diversification or higher value products [27–29]. They may even create barriers when established actors direct the means of support towards their own activities or business fields and pursue defensive strategies in the face of other interests or products [30]. Because NWFPs have largely not developed into a major sector, support structures for them such as the provision of statistical data, research, education, training, and advisory services are limited. Exceptions are chestnuts, cork, and truffles, for which interest organizations with significant institutional capacity exist beyond regional levels. In some cases, however, regional entities do provide support [12,19,22]. Interest groups for NWFPs or wild harvesting are rare. As a result, enterprises in the field of NWFPs often develop their businesses with little or no support from institutional actors [31]. These businesses often stay small and diffusion of new market ideas is poor or slow [12,31]. Business development and diffusion could benefit a lot from advisory support, networking, or financial grants [3,12,31–34].

NWFPs have diverse values, derived from both non-commercial and commercial uses, and dependent on geographical and historical contexts. To more fully understand their value, we need to examine their cultural and experiential dimensions. For such an analysis, we employed the value co-creation [35,36] and service-dominant logic approaches [18].

2.2. Applying SDL to Non-Wood Forest Products

Conventional goods-dominant logic posits the exchange of products (goods or services) as the primate factor in understanding of economic activities. In contrast, service-dominant logic (SDL) suggests seeing the exchange of service as the common denominator in the analysis of markets [18]. In this value-based analytical approach, service is understood as the process of using one's competences

(knowledge and skills) for the benefit of another party [20]. Services (in plural) are a product just like goods, but service (as used here, in singular) is a different concept. In goods-dominant logic, value is a property of goods and services, and is created by the producer. SDL value manifests itself only in use. Value is collaboratively co-created with the beneficiary and the beneficiary is, therefore, always an agent in value creation [37]. Value is personal and experiential. That is, it emerges from the activities of market exchange and encompasses both lived and imaginary experiences. It is, thus, socially co-constructed through direct and indirect interactions [35]. The beneficiary (the customer or user) needs to integrate the good or service from one provider with other resources obtained through the market or by other private or public sources [18]. This is a ubiquitous phenomenon that does not require direct interaction between the producer and the beneficiary [37]. Value is always defined in specific social contexts that are constituted by complex, reciprocal links between unique sets of actors [38]. On the micro level, two active participants serve each other directly in the service-for-service exchange. This direct exchange process may take place within complex networks and contexts at meso and macro scales that may include multiple indirect exchange processes. In addition to a firm and its customers, a range of private and public actors are part of wider actor networks that contribute to value creation processes [39]. The value co-creation approach of SDL proves useful in the analysis of services and innovations in the forestry sector [16,40–42]. Here, we applied it to analysis of NWFPs [22].

Applying SDL brings the experiences associated with NWFP harvest and use into focus, together with the material goods, and reveals a more fulsome suite of values and economic opportunities. This systemic view has implications not only for better analytical understanding of the roles of actors but also for managing value creation in practice and providing services for NWFP businesses [43]. In addition, innovations in service provision may come through new self-understanding entrepreneurs see themselves as operating within a system of actors and in evolving institutional contexts.

3. Methodical Approach for Studying Value Creation in Wild Forest Products

This article developed a conceptual model for analysis of NWFPs from an SDL perspective (Section 4.1) and applied it to three case studies in their regional and social contexts (Sections 4.2–4.4). The analyses drew on our expert knowledge of business practices and innovations in wild harvests and foraging in Europe and North America (e.g., [3,7,12,16,17,34,44]), as well as the literature on NWFPs, SDL, and value co-creation.

The case of maple *(Acer saccharum)* syrup production in the USA illustrates the diversity of values and actor networks that may develop around a single NWFP. Case studies from Austria (various wild species) and Italy (chestnuts, *Castanea sativa*) focus on the role of institutional structures that support utilisation of forest products. The latter two cases involve not only producer associations, but also associations that integrate different types of actors, including producers and consumers (in the Austrian Nature Parks, with its origins in the consumer sector), as well as public and private actors (in the Italian regional chestnuts association).

The analytical model and empirical analyses include the following elements: (i) actor networks, including human and nonhuman, direct and indirect, commercial and non-commercial, public and private network participants; (ii) cultural, social, economic, and institutional contexts; and (iii) micro, meso, and macro levels.

Data for the case studies in Austria and Italy were collected in the frame of a European Union research project (StarTree; https://star-tree.eu/), which conducted in-depth case studies and action research on NWFPs. The Italian chestnut case was based on the analysis of five semi-structured interviews with innovators and representatives from producers associations, as well as literature and document reviews. The analysis focused on the roles of companies, actor networks, innovation processes, institutional frameworks, policy means, and fostering and impeding factors within historic and regional economic and social contexts. The Austrian Nature Park case also was part of the StarTree action research project and focused on the sale of wild forest products to enhance farm incomes through the Nature Parks labelling scheme. The action research included a producers' survey, two initial

scoping workshops, and business development processes in three different Nature Parks [45]. The U.S. case study drew upon two decades of research on maple syrup [46–49].

4. Co-Creation of Value in Non-Wood Forest Products

4.1. Service-Dominant Analytical Model for Non-Wood Forest Products

Economic analysis using the value co-creation and SDL approach places primary attention on the service created for the customer, rather than the goods that are produced and marketed. Thus, the focus of analysis shifts from production and distribution of material goods to the creation of value through interactions between individuals and institutions in specific contexts and on various scales [18,20,38]. In the case of NWFPs, this includes a look at biological materials, practices and experiences associated with their harvest, processing, and use, and the values emerging from these. It places emphasis on foragers (also sometimes referred to as collectors, gatherers, harvesters, and pickers), chains of connection, and networks of exchange flowing from them.

Seen through the SDL lens, gathering NWFPs is a knowledge-intensive practice through which networks of human and nonhuman actors co-create value from forests. The basic network of actors includes (Figure 1): (a) forests, forest plants, and fungi; (b) family forest owners; (c) forest managers (who may or may not be the owners); (d) foragers; and (e) foragers' personal, professional, and business social networks. Where foraged items or products made with them are monetized and distributed beyond the forager's personal social network, additional actors (also referred to as beneficiaries) will include individuals who might be thought of as consumers and any individuals in a market chain between the forager and the consumer. These intermediaries may include producer associations, equipment or service suppliers, wholesalers, and retail outlets (micro-scale).

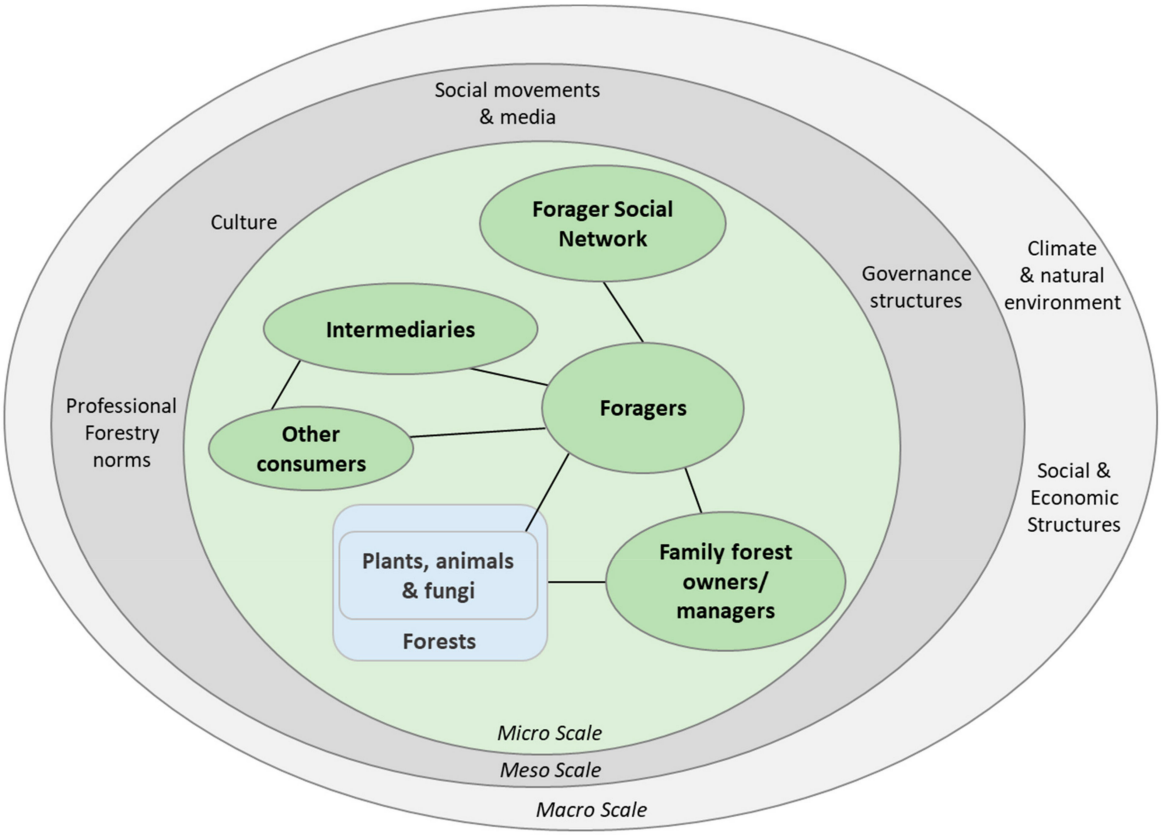

Figure 1. Non-wood forest product collection through a service-dominant logic lens.

We include forests, forest plants, and fungi in our analysis of actors. Scholarship in the tradition of actor network theory has highlighted the agency of nonhuman entities by analysing the ways in which, rather than serving as passive backgrounds or solely as things to be acted upon, the characteristics of plants, fungi, and animals interact with humans (and other nonhuman actors) to produce particular outcomes. Without anthropomorphizing them by attributing intent, this conceptual approach recognizes that the behaviours and properties of plants, fungi, and animals influence the outcome of human interactions with them. According to Jepson, et al. 2011 their characteristics have the "capacity to produce a phenomenon or modify a state of affairs" [50]. While noting they are important actors as consumers and distributors of forest plants and fungi, wildlife are outside the scope of this analysis.

The material of plants and fungi are essential but insufficient to the production of value from NWFPs. Rather, SDL brings into view the value derived from interactions between foragers and plants and fungi, as well as between foragers and other people with whom the practices of foraging bring them into direct or indirect connection. The meso- and macro-scale contexts of these interactions also play a key role in the co-production of value by actors by, inter alia, contributing to the creation of meaning from foraging and use of foraged materials and by serving to facilitate or create barriers to these experiences. The meso scale includes important institutional elements such as governance structures, advisory services and professional organisations, cultural and professional norms, or social actors or movements. The macro scale includes the ecological, institutional, social, and economic environments that condition populations and distributions of foraged plants and fungi, terms of access to them, and their commercial and non-commercial use and value in society.

Research in locations around the world shows that among the values produced by interactions characteristic of human foraging for NWFPs are food and other material uses, connections to nature, health and well-being, and economic benefits, including non-monetized economic benefits [51]. In other words, foragers integrate (or mobilize) plant materials and fungi with their competences (knowledge and skills), time, and labour to produce value. The values that emerge are both material (e.g., food, medicine, artisanal materials, etc.) and experiential (e.g., time spent in nature, further competence development), with the experiential values also offering tangible material benefits in the form of health and well-being [52,53].

4.2. Maple Syrup Production in North-America in Four Contexts

Maple syrup is an iconic forest product of north-eastern North America [47,54], produced by collecting and boiling down the sap of sugar maple (*Acer saccharum* Marshall). Sap collection and boiling occur when freezing nights and above freezing day-time temperatures result in transport of carbohydrate-rich fluids from the roots to the branches of sugar maple trees. Sap is collected by tapping into the bole of the tree and allowing the liquid to accumulate using technologies as varied as open buckets and vacuum tubing. Processing technologies have a similar range of labour and capital intensities from boiling in an open pan over a wood fire to use of reverse osmosis equipment to remove water and concentrate sugars in the sap prior to further processing in an evaporator.

Often referred to as sugaring, the micro-scale contexts of this practice include cultural maintenance, hobby, supplemental income, and commercial production (Figure 2). SDL applied to sugaring reveals networks of actors whose interactions create meaning and value, as sap is converted to syrup and makes its way through chains of connection to people both geographically close to and far from the forests where it originates.

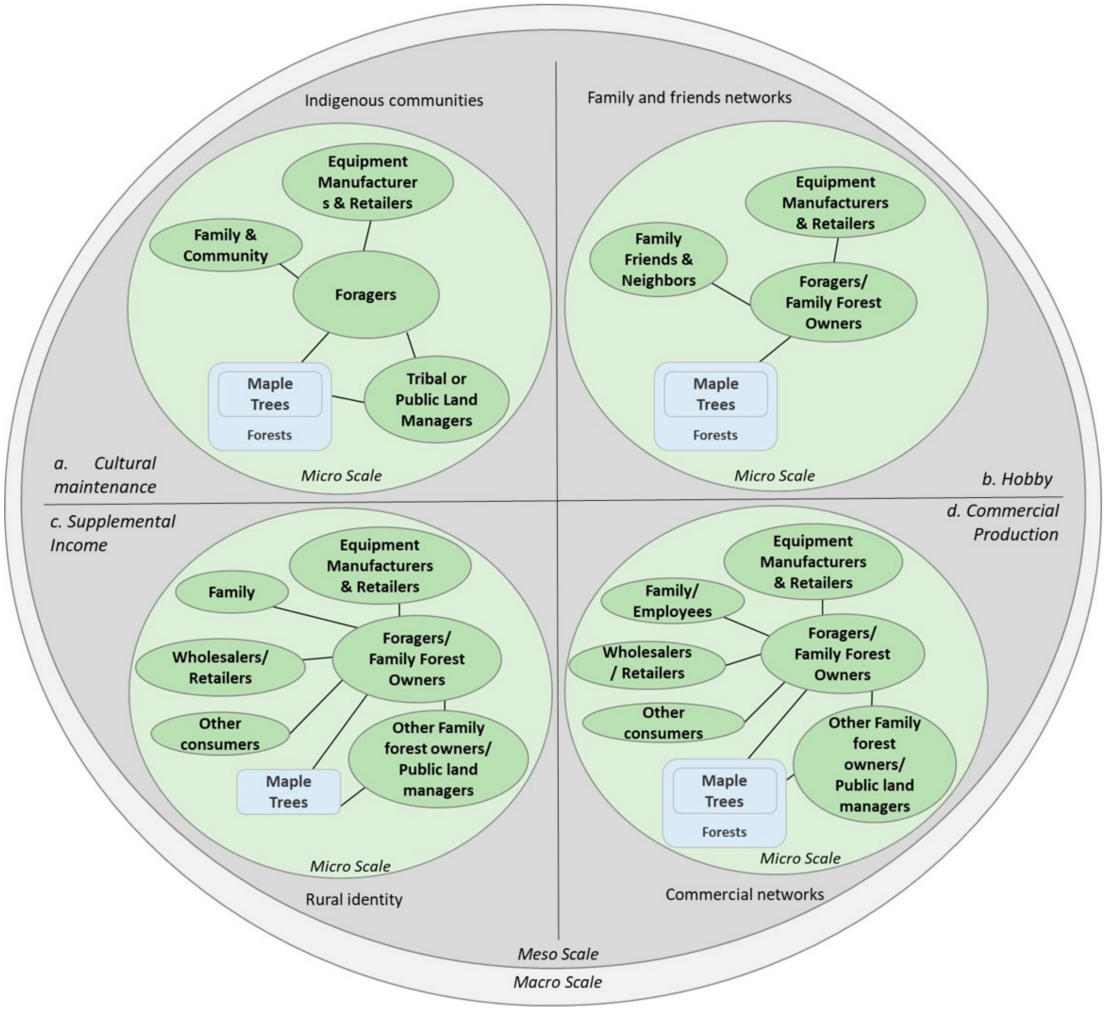

Figure 2. Maple syrup collection in four contexts: actor networks in sugaring as (**a**) cultural maintenance, (**b**) hobby, (**c**) supplemental income, and (**d**) commercial production.

Cultural maintenance: Maple trees are a cultural keystone species [55] for north-eastern North American indigenous peoples, and sugaring continues to be an important practice for many Native families (46). Sugaring brings together multiple generations to mark a key moment in the seasonal cycle that provides fundamental grounding for many aspects of indigenous culture (Figure 2a) [56]. Through tapping maple trees and processing maple sap, older family members help youth learn to read weather and forests. This time also is an opportunity to impart traditional teachings about what it means to be a member of the community and how to live in a good way. The beneficiaries extend beyond those who participate in the process itself, as older members of the community and others who may not be able to get out in the woods will be provided with maple syrup or sugar. Among the many values resulting from sugaring in this context, indigenous identity is sustained through production of a culturally significant food, which is part of observing rituals and other traditions. Likewise caring for and maintaining extended social networks through sharing syrup supports the fabric of indigenous communities.

Hobby: Many people who engage in maple sugaring do so as a leisure or recreational activity. More than 20% of respondents to a survey of members of a maple sugar producers' association reported their sugaring operations are for hobby purposes [49]. A majority indicated bringing together family, friends, and neighbours is a key benefit of their sugaring operation. In addition to being fun, maple sugaring motivates these people to get out in the woods and experience the transition from winter to spring. Social cohesion, a sense of emotional wellbeing, and connections to nature also are important

values for them. Reported uses of the syrup produced in this context include self-provisioning, gifts, and charitable donations, indicating that beneficiaries of hobby sugaring extend beyond those who participate in collecting and boiling maple sap to the larger social networks of hobby maple sugarers.

Supplemental income: For many sugarers, producing and selling maple syrup is a strategy for managing economic risk and coping with seasonal income flows and labour demands [47] (Figure 2d). Thus, for example, someone who has access to forests with a high concentration of maple trees and has regular but seasonal employment in construction or tourism can use sugaring to help fill out the work year. Sugaring also plays a role in defining rural identity in the region where sugar maples are an important forest species. As such, sugaring both emerges from and creates community culture, connecting people to place and each other as sap is harvested, processed into syrup, and sold by people who gather year after year to do so. For some, the social relationships thus developed and maintained may have value regarded as commensurate with the income.

Commercial production: Owners of large sugaring operations stress their economic purpose but also note social and cultural values from them [49] (Figure 2d). Large producers generally own significant forested lands (average of 117 acres in the survey cited above) and are more likely to have invested in high technology equipment. In many cases, they lease the right to tap maple trees in woodlands owned by others and may purchase sap from additional sugarers to augment their own production. Thus, their operations may involve chains of connection to multiple forest owners and forested areas. The distribution of syrup produced by these large commercial producers frequently connects to geographically extensive networks of exchange, as they may sell through wholesalers and retail stores. Although income is the central goal, it is not the sole benefit. These producers also place a high value on bringing together family and friends, as well as maintaining a family and/or cultural tradition. Other factors that are important to them include getting outdoors, preserving the craft of sugaring, and connecting to land. Thus, commercial production of maple syrup produces important relational values in concert with economic benefits.

Although our emphasis here is on the network of actors at the micro scale, each of these cases is embedded within meso- and macro-scale contexts. Although some specific elements in these scales may vary between case studies, general patterns and processes are similar. At the meso scale, professional forestry norms are a factor in shaping forest composition, including the presence, age, and health of sugar maple. Land tenure systems and governance structures affect who has access to those maples for sugaring. Social movements and media extolling the virtues of natural products can affect perceptions of the qualities of maple syrup by individuals far from the forests and processes that produce it, creating both meaning and markets for it. Likewise, culture may imbue maple syrup with special meaning for those who make or consume it. As the case study descriptions suggest, (re)production of identity is salient at both micro and meso scales. Whether Indigenous or European-American, many sugarers are self-consciously enacting their identity through maple syrup production (micro-scale), drawing on knowledge with strong identity or cultural associations (meso-scale) to do so. At the macro scale, sugaring depends upon climate, requiring diurnal freeze-thaw cycles. As with all forest products, larger social and economic structures influence the distribution and exchange systems available to harvesters who produce maple syrup. Thus, for example, national policies may influence the conditions of international commerce in sap and finished syrup.

4.3. Nature Park Specialities—A Label for Integrated Landscape Management and Marketing

Austrian Nature Parks are a specific legal category of protected areas, which are usually managed by associations of local stakeholders such as municipalities, tourisms boards, and land owners (Figure 3). They aim to preserve cultural landscapes through an integrated development approach that combines nature conservation with sustainable use of natural resources. For this purpose, they promote traditional, environmentally friendly forms of land use and offer various forms of support for land owners which include information, awareness raising, and training, as well as regional marketing of the Nature Parks, tourism, and educational activities. Environmental education includes, among other

activities, guided tours, and workshops such as "Cooking from the meadows" where a nature guide takes the participants out to collect edible plants and shows them how they can be used for preparing natural drinks or foods (example originates from the Styrian Nature Park "Mürzer Oberland"). In all business activities in the frame of the Nature Parks, the micro and meso scales are closely intertwined, as the micro-level exchange depends on the meso-level institutional context, particularly with a newly developed marketing label for Nature Park Specialities.

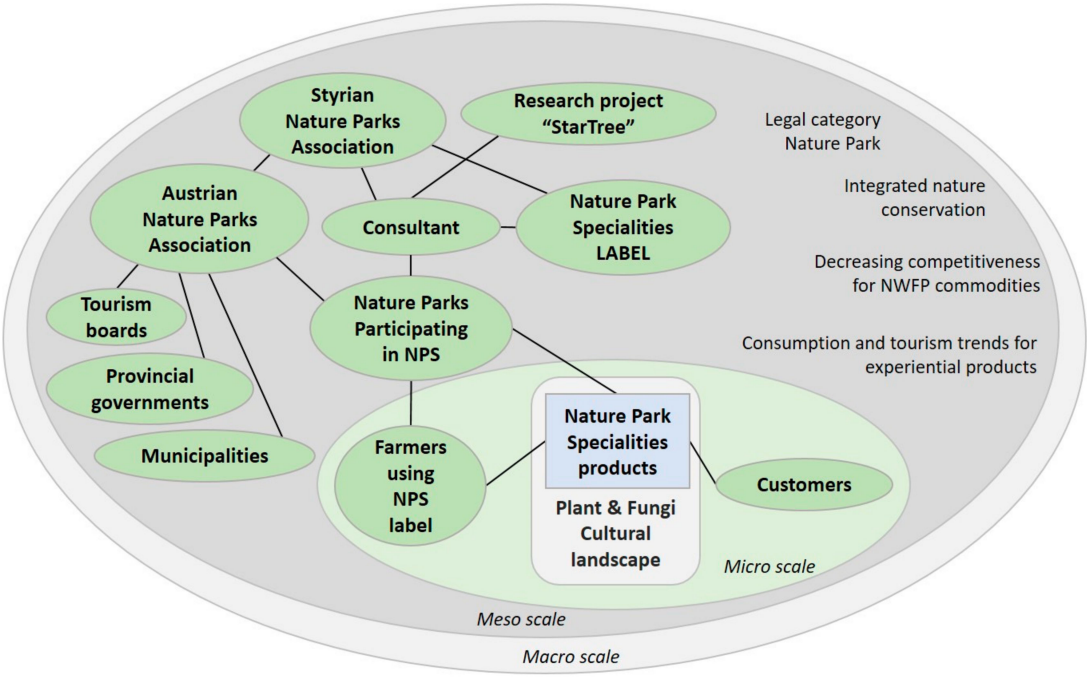

Figure 3. Actor network and context of the "Nature Park Specialities" (NPS) label. NWFP: non-wood forest products.

The Nature Parks offer support for marketing regional and environmentally friendly farm products under the label "Nature Park Specialities" [12]. The choice of traditional agricultural products was extended to NWFPs. Because some Nature Parks are strongly shaped by woodland, the idea arose to develop wild forest products in the frame of the label. Examples are cowberries (*Vaccinium vitis-idaea*), rowanberries (*Sorbus aucuparia*), and blackthorn (*Prunus spinosa*), which are made into jams, chutneys, or liquor. Other examples include wild honey; oils with herbal extracts; essential oils (Swiss pine (*Pinus cembra*); spruce (*Picea* spp.)); and various *bouquets garnis* (partly of wild harvested material) used as teas, bath additives, and other purposes. In most cases, the producers are farmers with small holdings, who process and merchandise directly on their farms, at farmers' markets, to regional food retailers, and through service points at the Nature Parks. In the framework of a European research project (StarTree), and with the help of a regional development consultant, three parks developed their own activities. In the Styrian project "Colourful hedges and edges of woods", located in the Nature Park "Almenland", trees with colourful fruits and autumn leaves are planted at forest edges or hedges and along roads so that the fruits can be used by farmers and small processors of the region. At the same time, the trees contribute biodiversity conservation and make the landscape (even more) attractive and promote tourism development. A consultant reports on a workshop with farmers [45].

> "There existed already an initiative to promote the planting of certain local trees and shrubs such as rowanberry and blackthorn in private gardens in order to replace exotic species. This idea was now expanded to planting the colourful trees also at forest edges as the fruits can be used for producing rowanberry *liquor* and other products."

In another Styrian Nature Park ("Südsteiermark"), a business plan was developed for joint merchandising and business promotion, in which local farmers might establish their own shop with an assortment of products with a long shelf life (jams, syrups, liquors, herbal teas, etc.), or supply local shops, hotels, restaurants, and wineries with a variety of durable products on special shelves. In the Tyrolean mountain Nature Park "Kaunergrat", farmers realised that they mostly offer liquor, but that hard liquor does not fit their customer base, which consists mostly of families that come to hike. They discovered further that for better marketing they need to invest in attractive packaging with a common design and stable product supply throughout the year. As a result, they developed a broader portfolio of products, established a common design, and set up new common processing facilities.

Nature Park Specialities can be seen as experiential products [57], to various extents. In guided tours and production workshops for drinks, foods, and soap, among others, service is the primary product, whereas the self-made goods are more an add-on. When consumers buy Nature Park specialities with the specific label from the shelves in a supermarket or Nature Park shop, the good is the primary purchase but they pay a higher price for the label that indicates its origin from the Nature Park. The added value is the knowledge they are consuming something from the beautiful nature they have visited or are imagining in their minds.

On the meso scale, we find both hindering and supporting context factors. The agricultural sector as "resource users" and nature conservation as "preservers" have often conflicting views on land management goals, an opposition which is broken up in the regional and cross-sectoral structure of the Nature Park. Decentralised governance structures can be capable of creating integrated solutions across sectoral boundaries [2], here with the concept of integrated nature conservation. The Nature Park specialities are embedded in larger macro scale structures such as the multi-level democratic governance system of the European Union and national, provincial, and municipal governments, as well as economic trends of declining competitiveness of NWFP commodities in a high labour cost country but increasing demand for experiential products.

This case study stands out in that the initiative comes from outside the farm and forest sector, namely, from nature conservation. With this external impulse and the accompanying support, local resources, traditions, and creativity are bundled into innovative activities. Factors in its success include institutional support from the Nature Parks Association, a consultant, and a research project, in addition to the bottom-up approach through which it was applied. From an SDL viewpoint, value creation goes beyond a customer-oriented product development process. Rather, it must be seen as the result of a complex interaction of natural landscapes, traditional culture and land uses, modern urban values, and current legal and institutional frameworks, which include the existence of nature parks, international research programmes, and regional development consulting services. As a result, in addition to new products and better marketing approaches, complex solutions adapted to local contexts and the needs of producers, customers, and landscape conservation were created, with innovative measures along the whole length of the value chain, from land management to merchandising. The innovative solutions developed through cross-sectoral interaction at the micro level. In the following territorial marketing initiative around chestnuts, the actor network is even more complex with even more cross-sectoral connections.

4.4. Chestnuts—A Traditional Product for New Territorial Marketing

Historically, in Italy, chestnut cultivation was an important source of livelihood for people living in rural areas. At the end of 19th century, in Trentino, an autonomous province in Northern Italy, the chestnut was the "fruit tree cultivated with more profit and greater extension" and it was considered "the bread of the poor" [58]. However, during the 20th century, similarly to what happened in many areas of Italy, chestnut cultivation experienced a dramatic decline, partly due to abandonment of rural areas, decreasing competitiveness, and a restructuring in agriculture.

In the southwestern part of the region, the old chestnut tradition has been re-established recently [31]. Since 1994, local people from the village of Castione have been working together in the

association "Associazione Tutela dei Marrone di Castione", which has around 100 members today, consisting of chestnut growers and other supporters. Thanks to the efforts of the association, the old chestnut groves were restored and are now well managed, delivering profitable production and representing an important landscape asset of the region. The chestnuts groves system is a traditional agro-sylvo-pastoral landscape. It includes the presence of cattle, which allows a clean undergrowth to be maintained. The system also represents a shelter and feeding area for wildlife; protects the soil; and purifies the water [59].

The success of the association is strongly based on the chestnut growing culture that the members inherited from their ancestors,

> "To do what we do, first of all there is the need of a predisposition, which you must receive from the family. Your point of origin is important. In your veins the blood of the activity must flow. The true sportsman must have breathed sport. In our case we have chestnuts in the blood. It is transmitted to you in the place where you were born. It is a culture."
>
> (interview with a member of the association).

At the micro level, the actor-to-actor interactions include the commercial production, with growers selling high quality fresh chestnuts and partly processed products such as flours or sweets directly to consumers. Interactions with a local distillery have resulted in the creation of an innovative sweet creamy liquor. Other practices include traditional landscape maintenance, with actions such as pruning and mowing in the private and public spaces.

However, it was only at the institutional level, thanks to the active collaborations of a diverse set of actors, that the success at territorial level was possible, leading to a value-creation space view (meso-scale). Farmers gathered together into the association with passion and with the aim to conserve their traditional culture. Multiple networks of the past were important to enable the work of today,

> "In the past, Castione artists, specialized in marble sculptures, travelled around Italy and Europe. In addition to offering their professionalism, they brought with them the best products of their land, Castione's chestnuts. They were very appreciated. Why we did not completely abandon the chestnut activity as it happened in other places? I think that the role of the artists was for us the basis and helped to indissolubly link the place to the product and vice versa. So, chestnuts of Castione are, and will be, recognized, both in Italy and abroad. These are things to take seriously. They have a historicity. And I believe that in a globalized world more and more it will be necessary to link the products to the territories"
>
> (interview with the president of the association).

The association promotes chestnut cultivation and teaches people how to manage chestnut orchards not only in the Castione area but also at regional level and beyond, provides a conservation standard, and defines prices. All of these elements have been able to build a functioning framework and a trade structure, guaranteeing a high-quality product and allowing the restoration of the landscape. In addition, the association cooperates with the regional tourism sector, with restaurants and hotel owners, wine producers, and artists. These actors share the same aim and work together to create a territorial marketing strategy, under the common denominator of the chestnuts, which during the fall season attracts tourists to the area. The association offers a territorial value proposition and the multi-actor networks, through several chains, also reach people that are geographically distant. The governance structure pivots on important and passionate figures, such as those that on turn cover the role of president and vice-president of the association, and can count on the work done on a voluntary basis by farmers and other supporters. The members report that the engine of their passion and the voluntary work originate from the strong sense of belonging that they have toward the integrated agro-sylvo-pastoral system, which includes the presence of nonhuman elements, both plants and animals.

The season culminates with the annual chestnut festival, which is sponsored by several private companies and gathers thousands of people. During the event raw, cooked, and processed chestnuts are sold, and guided tours are organised. The storytelling of the landscape and the traditional culture is presented through the "National Festival of Arts Graphic Humour – the Smile of the Chestnut". The culture of chestnuts is promoted through gastronomic competitions that involve the best chefs and wine cellars of the region.

The association can count on co-financing and support by public and semi-public bodies at different scales. For cleaning, pruning, and restoring their orchards, many farmers have applied for EU Rural Development Programme funds. Other funds for rural development and for the work of the association come from the regional, provincial, and municipal level, namely, the Autonomous Province of Trento, the Municipality, the Valley Community, and the regional Association for the Promotion of Tourism.

The association did not only build a local network but is also a member of the National Association of Chestnut Cities and the European network of chestnut growers and processers, and has been successfully initiated a national chestnut plan [58], implemented by the Italian Agricultural Ministry. Recently, with the support from the Ministry and a national research organisation, the association has played a crucial role in the process of developing and applying a successful remedy (natural antagonist) against a pest spreading throughout chestnuts in Europe (*Dryocosmus kuriphilus* Yasumatsu).

With its traditional but redefined "experiential" forest product and its European setting in a high labour cost country with a multi-level democracy, the macro scale frameworks and developments are similar to the Austrian case.

The chestnut case from Castione illustrates how diverse types of actors collaborate on various scales for the development of goods and services and for the promotion of the region (Figure 4). The actors span land-owners, processors, other sectors, artists, and public bodies. They act within a system of formal institutions (organisations and policies) as well as informal institutions such as traditional culture and current regional identity. Innovations occur on company level (e.g., invention of the chestnut liquor), regional level (the association as an institutional and social innovation), and beyond (national and European associations). It would, however, be artificial to separate different innovations, for example, the product, service (festivals), process (e.g., the pest control), marketing (e.g., competitions), institutional (e.g., national chestnuts plan), or social innovations (e.g., volunteer collaboration for reviving the traditional culture and the territorial marketing of chestnut, and redefining the traditional staple food as a gourmet product), as all these are linked to and depend on each other. The value creation can only be understood when looking at the process and a multi-layered network as a whole.

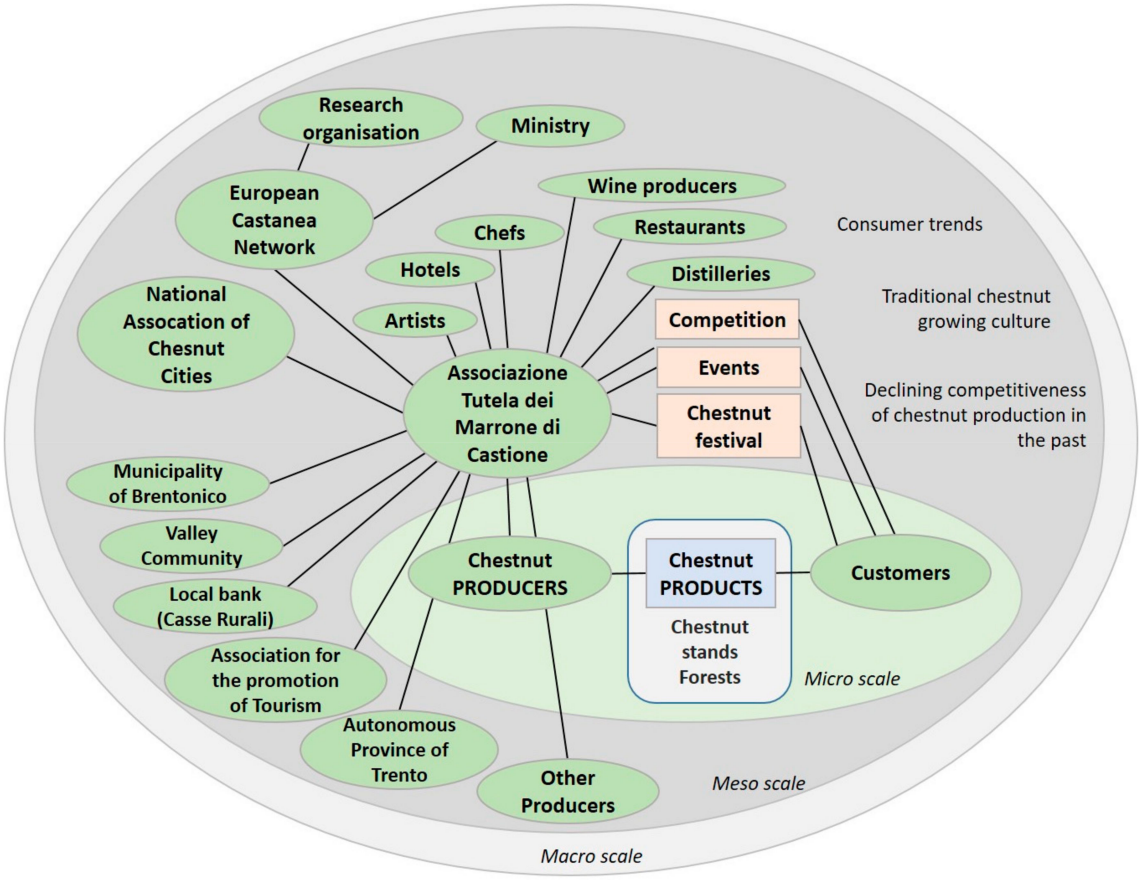

Figure 4. Actor network and context of the regional marketing initiative of "Castione" around chestnuts.

5. Discussion and Conclusions

In the following subsections, we relate our results to innovation processes and the actors in them (innovators, service providers, and policymakers) and propose how co-creation can be realised on different levels to support innovations in NWFPs in future.

5.1. A Broader Understanding of Value Creation in Forest Products

The shift from goods-dominant to service-dominant logic [18,39] advances the understanding of the multiple roles of forest products in commercial and non-commercial contexts. In each of our case studies, the value of NWFPs is grounded in cultural values associated with the products offered and consumers' motivations.

SDL postulates co-creation of value through interaction between producers, consumers, and other actors in specific institutional settings [39]. Any analysis of innovation processes and value creation therefore must include the complex actor networks and institutional and social dimensions, which may go far beyond mere product developments or customer orientation towards social goals such as regional development, environmental conservation, or cultural identities. Thus, in addition to going beyond a producer-centric view or the analysis of production and marketing, SDL also requires attention beyond value-chain analyses and systemic innovation models.

Systemic innovation models [60–62] describe innovation processes as complex interrelations of multiple types of actors beyond the firm and formal and informal institutions [26]. They are, however, relatively pragmatic and atheoretical when analysing actor relations or the role of institutions. With the application of SDL [43,63], we included institutional, social, and cultural dynamics that are recognized as playing essential roles in the process of value creation and innovation. This approach demonstrates that conventional classifications of business-related innovations [64] are insufficient

to capture and cultivate the sources of NWFP values, even when broadened to include institutional or social innovations [65]. Similarly, distinction between product and service innovations becomes obsolete in the case of experiential products, where the good and the service are embedded (e.g., the mushroom in the cooking workshop or collection tour, or remembering the landscape when eating the jam labelled as a Nature Park product).

Cultural dynamics are the driving force rather than company innovation when sugaring is experienced as cultural practice instead of commodity production. Fundamental social changes play a crucial role in the renewed interest for forest products when the wild or natural origin is certified for the Nature Park products. Likewise, institutional and cultural frameworks for producing and marketing chestnuts have changed profoundly—production changed from a staple subsistence food of a regional agrarian economy to a regional speciality marketed as an entertaining experience to outside tourists in a globally competitive economy. Business innovations and social-economic changes are interrelated processes—when considering innovations at the company and institutional scales in chestnut-based territorial marketing, it becomes clear that the sale of chestnuts and the existence of the association are mutually dependent. Without successful chestnut production, the association probably would cease to exist. Single innovations such as new chestnut products, promotion events, or the new perception of a traditional poor people's food as a gourmet product can only be understood when looking at the whole process, which intrinsically is an institutional and cultural process.

5.2. A New View on Customer Relations

Our analysis describes complex commercial and non-commercial relations of people to forest products based in traditions and other cultural contexts that produce value to people. We argue that the complexity of these values is relevant for businesses, even if many of these values are intrinsically non-commercial. For many people that grew up with the habit of gathering from the wild, on the basis of traditional practice and everypersons' rights, the special value of those goods lies in their free availability in nature. In this instance, purchasing the products or paying for the right to collect them may not be an option, as this would destroy the specific value for them. For others, nostalgic memory can be the impetus for buying goods and paying a higher price when they are locally produced, or for travelling on holidays to where the goods are produced in order to collect or buy them or attend workshops or guided tours with family and friends.

Complex cultural values thus create business opportunities, which can only be developed fully when understanding the values behind them, namely the fact that people are willing to pay because of the non-commodity characteristics of these traditional, regional products. The special value can in many cases be understood as an experiential offer [16,57,66,67]. The experiential aspects are more explicitly developed in examples where customers are involved in an activity such as educational services (e.g., exhibitions, seminars) and entertainment activities (e.g., chestnut festival). The experience is also indirectly included in a product when marketing touts it as a local, traditional, or hand-made product (e.g., label of Nature Park Specialities). Through such place-making marketing, businesses simultaneously achieve authenticity and escape the commoditization trap, generating demand [16].

The question arises whether there is an actual societal and business trend toward increased importance for experiential offers or simply a new analytical perspective that reveals these qualities and relations. We believe it is both.

5.3. A New Approach for Service Providers and Policy

Service providers such as extension services, producers' associations, or consultants can play key roles among the multiple actors involved in the complex value creation process. They have a special function as they often link producers with other actors in the value chain and meso-scale institutional processes. Service providers often facilitate innovation through networking various public and private stakeholders. They may also support provide financial or legal support. With their personnel and knowledge capacities, public and private service providers are especially suited to utilise advanced

information or decision support tools that can support business owners with information that would otherwise not be available to them.

Because NWFPs open new market fields, there is a need for cross-sectoral thinking (e.g., with food or health sectors) or connecting across societal groups (e.g., rural/urban). For successful innovation support, service providers need to develop this ability. Traditional forestry organisations may be less prepared to provide such cross-sectoral, cross-cultural links than regional development oriented organisations, where multisector actors already are incorporated [26]. Associations can provide multiple services that contribute to value creation, including advisory services for producers and joint business activities (e.g., joint marketing), as well as interest representation vis-à-vis policy-makers and public relations activities. Regional organisations (rural development consultants, chestnuts association, Nature Parks) are particularly adept at understanding the needs of producers and consumers and their role in value creation and economic development. Specific local organisations or producers' associations can provide important institutional capacities for innovation and business development; however, their creation often depends on support from other institutional structures [31], be it sectoral organisations (forest or nature conservation associations) or regional bodies (local or regional governments).

The cases analysed here suggest that an orientation toward broader common goals such as strengthening a sector or establishing a product; contributing to jobs and income in a region; or maintaining natural or cultural environments may be important factors for success of the service provider function. This is facilitated by understanding co-creation processes and the cultural dimensions of their role. Acting on such a broadened understanding, advisory and support services orient themselves toward both their customers (forest/business owners) and final consumers and societal benefits. By including self-reflection as part of the service ecosystem, service providers enhance their capacity for collaborative innovation [43].

SDL has profound implications for policy-making and for the design logic of support instruments. It calls for stronger stakeholder participation and co-creation mechanisms in the development and implementation of policy measures at all administrative levels. Making that work requires a stable institutional framework characterized by sufficient capacity and coherence. To support innovation, a stable and reliable environment is needed, for instance, with regard to property rights, administrative structures, and funding instruments. Good institutional capacities are particularly important for upscaling or diffusing innovations at the scale necessary to produce economic impact for rural development [31]. At the same time, support programmes need openness and flexibility to adapt to emerging ideas from local actors and bottom-up initiatives. They would benefit from a focus on unusual ideas, cross-sectoral interactions, and early phases of innovation, employing a risk- and innovation-friendly approach [26,68], as well as support instruments and support structures that provide information, networking and financial means in tailor-made support measures [12,22].

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