ECOSTAR
NATURAL TALENTS

ARE NATURE-BASED BUSINESSES REALLY INNOVATIVE?

An assessment of European entrepreneurial initiatives

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Università degli Studi di Padova

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Ecostar contacts
info@ecostarhub.com

Authors and affiliation
Colm O'Driscoll (ETIFOR)
Alessandro Leonardi (Unipd)
Mauro Masiero (Unipd)

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EXECUTIVE SUMMARY

This report presents the results of an assessment of the innovation degree of sixteen nature-based businesses in the European Union (EU). Nature-based businesses are socio-economic initiatives that make profit by marketing, promoting and enhancing biodiversity and ecosystem services.
The selection of initiatives was from an overall sample of forty and was based on: a) Success of their business models; b) Affinity with the concept of Market Based Instruments (MBIs) for biodiversity and ecosystem services conservation; c) Level of general sustainability of the model; d) Level of innovation of the business model; e) Level of reinvestment in natural capital. The selected businesses were further divided into four thematic areas, where each thematic area was also represented by one of four countries: 1) Natural Capital Accounting (United Kingdom); 2) Wild Forest Products Marketing (Italy); 3) Forest and Carbon Certification (Spain); 4) Ecotourism (Romania).
The assessment was based on an innovation radar and a custom-made assessment framework for innovation where six dimensions were chosen for the graphical representation of innovation. These included: 1) New product and outcome; 2) New approaches to creating value; 3) New approaches to resource use;
4) New processes; 5) New markets: demand and needs; 6) New networks and organization.
As the nature-based businesses were selected from the most innovative, the benefit of this assessment becomes evident in the demonstration of where the business initiatives are lacking in innovation and not in the demonstration of high-performance of innovation. Indeed, it is where a company can use the knowledge to improve, specifically where it lacks innovation, that it has the greatest possibility to become financially sustainable and succeed. Another benefit of such an assessment is the transfer of knowledge. Companies that lack innovation in some areas, and know which areas, can be complimented by the companies with business models that have high levels of innovation in those areas, through business knowledge sharing.
To this end, the findings of the assessment show that overall there is a high level of innovation in nature-based businesses in the four thematic areas and their representative countries based on the established assessment criteria. However, the main findings that show where the businesses lacked innovation relating to firstly, innovation across the thematic areas and secondly, innovation in the six dimensions, include:

- Of the four thematic areas, the least innovative one resulted to be Ecotourism (Romania). This thematic area also resulted as having the least innovative business – Equus Silvania – of all the nature-based businesses assessed in the four thematic areas, this was mainly due to poor scores in assessment criteria that resulted as lack of partnerships, contacts, brand and supply chain.
- Of the six dimensions assessed for innovation, the least innovation took place in dimension two; “New approaches to creating value”. This was mainly due to a lack of brands across the initiatives (brand creation, strategy and extension).

These findings indicate that from the 16 nature-based businesses assessed, to increase innovation and the possibility of financial sustainability, the focus should be improved on applying “New approaches to creating value” (more specifically, on the creation of a business brand, having a clear business strategy, and then extending that brand to survive), however, this focus should not exclude the other dimensions. Considering

the importance of brand in market strategy, such results may indicate why there is poor uptake of market-based instruments for nature conservation. Indeed, improving the knowledge transfer of “New approaches to creating value” (brand creation, strategy and extension) between new nature-based businesses and more successful innovative nature-based businesses could increase the uptake of market-based instruments for nature-based business innovation, and indeed, contribute to their development, success and maturity.

ACRONYMS AND ABBREVIATIONS

BES	Biodiversity and Ecosystem Services
CICES	Common International Classification of Ecosystem Services
EEA	European Ecosystem Assessment
EU	European Union
FERN	Forest Education and Research Network
FSC®	Forest Stewardship Council®
MBI	Market-based Instruments
MCF	Magnifica Comunità di Fiemme
MEEB	Market and Economics of Ecosystem and Biodiversity
PES	Payment for Ecosystem Services
REDD	Reducing Emissions from Deforestation and forest Degradation
SBP	Sustainable Biomass Partnership
SFM	Sustainable Forest Management
TIES	The International Ecotourism Society
UNECE	United Nations Economic Commission for Europe
UNEP	United Nations Environment Programme
WWF	World Wildlife Fund

1. INTRODUCTION

Unprecedented loss of the Earth's natural capital, specifically biodiversity (WWF Global, 2014), in recent years, has highlighted the need to improve the sustainable management of the world's natural resources. Due to partial failure of command and control policies, evident in regional areas like the EU, for example, in the disproportionate distribution of funding allocation between sectors (Szedlak, 2009), and the difficulties in changes to policy and new policy implementation (Richardson, 2001); more recent approaches to resource management have been developing using Market-Based Instruments (MBIs), such as taxes and incentive schemes (including offset schemes, trading pollution permits and trading access rights - UNEP, 2011). Indeed, MBIs suit as instruments for the correct and sustainable use of benefits and goods of environmental services' as, in general, they improve user behaviour by addressing and adapting to market failure (Coggan & Whitten, 2005). Contrary to government-led top-down regulations, many bottom-up initiatives (like MBIs) are often implemented and started by local and grass-root level organizations (Mariam, 2011) and so, in a sense, offer the possibility of real change by giving empowerment to people at local and "grass-root" levels. MBIs are considered innovative and successful instruments, however, when it comes to their implementation, there is a general need for their scaling-up, as often they only reach "pilot" stage, with much fewer "active" schemes that reach financial sustainability. MBIs can offer a renewed and innovative approach to sustainably managing, more specifically, environmental services through compensation and/or mitigation programs across different sectors in the EU, including forestry, and forestry and environmental-related sectors. Indeed, of the MBIs that have achieved this, they are mainly in the public sector through publicly-funded Payment for Ecosystem Services (PES) schemes and certification of mainly public forests and associated products (Ezzine-De-Blas *et al*, 2016; UNECE, 2011; Rametsteiner & Weiss, 2004). In relation to PES schemes, in both public and private sectors in Europe there is a general scarcity of active schemes (Forest Trends, 2011; Ezzine-De-Blas *et al*., 2016; Forest Trends, 2014), where the private sector has had much fewer examples.

It is only in recent years that innovative ways of marketing ecosystem services have started to emerge. This innovative marketing through MBIs, has often led to the creation of new organizations or business ventures that promote sustainable use of resources and reinvest in ecosystems and their service provision as part of their business models.

It is important to note that policy may not be the only barrier to upscaling MBIs for ecosystem service conservation, there may be others such as the "commodification of nature", indeed, Boisvert, Méral & Froger, (2013, p. 12) state such links as driving "*conservation policy toward an extreme focus on commodification*".

Thus, it is evident that there is a need to better understand why and where existing initiatives fail to upscale. One such way could be to understand why and where they lack in innovation and entrepreneurship in their implementation. Understanding the weak points is useful to see where improvements are needed, while increasing the economic viability of these instruments, and ultimately increasing the private sector involvement.

One reason for the lack of innovation and entrepreneurship in nature-based initiatives, could be the lack of entrepreneurship in the forestry sector as a whole (Rametsteiner & Weiss, 2004). Indeed, if we consider that innovation and entrepreneurship are linked (Venkataraman, 1997), this could also be the reason why there is a

lack of innovation *per se*. By understanding areas in which innovation exists, we can see what drives nature-based businesses to choose business development in natural capital and environmental services in the EU, and how we can help foster and support new business development and growth in a sustainable way.
To tackle the aforementioned problem, this study presents the following objectives:

1. To identify and assess financially sustainable entrepreneurial nature-based business models that invest in natural capital and promote/enhance ecosystems services;
2. To assess their degree of innovation based on a custom-made innovation framework;
3. To discuss likely lack of innovation and entrepreneurial attitude as to justify the slow uptake of market based instruments for nature conservation.

1.1 Entrepreneurship in nature-based businesses

Innovation is an outcome of the act of entrepreneurial activities and behaviour (Bruyat & Julien, 2001; Dees, 1998). Therefore, before defining innovation in this specific field, it is important to define what entrepreneurship in nature-based businesses is. Entrepreneurship, as a field of study, is quite well developed but, nonetheless, incomplete. Jean-Baptiste Say was the French economist and businessman who developed the term "entrepreneur", more than 200 years ago, and his definition, looks at the entrepreneur as purely *value-driven* (Say (revisited), 1971). Joseph Schumpeter, according to Drucker (1985), changed this by expanding on Say and looking at more than just the value, he also looked at entrepreneurial innovation. However, creation of value is not the only line of enquiry in entrepreneurship. Palmer (1971), one of the pioneers of approaching the definitional problem of the entrepreneur from a psychological perspective, states that "*to understand adequately the role of the entrepreneur, economic and psychological factors must be considered*" (Palmer, 1971, p. 36). Gartner (1988, p. 62) states that "*focusing on the traits and personality characteristics of entrepreneurs"* actually inhibits and complicates agreement of a general definition and proposes a short, but powerful, definition describing that entrepreneurship is the "*creation of organizations*" (Gartner, 1990, p. 62). Much work has been done since in the exploration of the field to the point where three main categories exist: "*what happens when entrepreneurs act; why they act; and how they act*" (Stevenson & Jarillo, 2007, 1990, p. 18). However, Shane and Venkataraman (2000) state that it is not enough to focus on the performance of individuals for defining entrepreneurship and then go on to define entrepreneurship, giving a very complete definition focusing on much more than the *who* and the *what*, but also the *how*. Dees (1998), adopts a similar approach, resulting in a rotund definition including also *resourcefulness* (Peredo & McLean, 2006a). Dees' work is cited and added to by including also the *risk* factor (Tan *et al*., 2003).
Although these definitions give a good foundational framework for what entrepreneurship actually is, they don't include the entrepreneurial context. Indeed, in the evolution of the term entrepreneurship found within the literature, often the context of entrepreneurship is defined by the word that precedes it; corporate entrepreneurship and social entrepreneurship are some examples. With this in mind, considering our research context is defined by nature-based businesses, we adopt the definition of entrepreneurship in nature-based businesses as ecopreneurship; **an innovative, market-oriented and personality-driven form of value creation through sustainable environmental innovations in products and services exceeding the start-**

up phase of a company (based on Schaltegger, 2002). However, it is also important to define what nature-based businesses are, therefore, for the purposes of this report, **nature-based businesses are socio-economic initiatives that make profit by marketing, promoting and enhancing biodiversity and ecosystem services**. They do this, by innovatively applying market-based instruments to increase the sustainable management of valuable ecosystems and natural capital and biodiversity. Considering the relevance of innovation in the entrepreneurial process, and to the aims of this report, in the next section, innovation, and the rational that led to the choice of definition for the innovation assessment of businesses, will be described.

1.2 Innovation in nature-based businesses

Innovation is a core element and "specific tool" of entrepreneurship (Drucker, 1985). Schumpeter (1942), who has been described as one of the most influential theorists in the establishment of the term since its coining (Śledzik, 2013), stated that entrepreneurs, in part, exploit "*untried technological possibilities for producing new commodities or producing an old one in a new way*" (Dees, 1998, p. 2). Schumpeter (1942) also developed a framework of innovation dividing into five key types as follows: **1. Launch of a new product or a new species of already known product; 2. Application of new methods of production or sales of a product; 3. Opening of a new market; 4. Acquiring of new sources of supply of raw material or semi-finished goods; 5. New industry structure such as the creation or destruction of a monopoly position** (Schumpeter, 1942; Hagedoorn, 1996; Śledzik, 2013). However, innovation, like entrepreneurship, is multi-faceted and it is important to establish, for the purposes of the objectives, a suitable definition. According to Adler (1989) and Brown and Eisenhardt (2011), innovation research can be separated into two categories: the first category focuses mainly on innovation and associated patterns in different industrial sectors and countries over time; while the second one deals mainly with new products and product development. Considering that one of the aims of this assessment is to assess the "degree of innovation" of companies marketing ecosystem services and natural capital, the second category of innovation will be chosen; new products and product development, where, for this report, services and businesses themselves are also included. Innovation *per se*, if compared to entrepreneurship, seems to have a more coordinated consensus in literature. Indeed, both the Oxford English and Merriam Webster online dictionaries concede to: the clear introduction of something new, new ideas, methods or devices, with the Oxford Dictionary going a step further to talk about new processes and change. Although these given definitions are quite generic, the emphasis on "adding something new" across the stated definitions is quite clear. As is the case with entrepreneurship, often, innovation is also defined by the area to which it refers. However, innovation is generally defined on the product and the process and not the person, and so it can be connected to more than one context. As this study assesses the degree of innovation in nature-based businesses across the European Union, there are two contexts for innovation: the first is the assessment of the businesses themselves from an economic perspective and the second is the importance of the innovation connected with the social and environmental impact and outcome of the study, that is, the fact these businesses are nature-based, and their impacts and outcomes on society. Consequently, the areas to which this assessment of innovation will be part of include

business innovation and social innovation. Overall, the importance of business innovation can be quite easily associated with generating financial sustainability, however, the importance of social innovation has less clear associations, although in recent years, much work is being done into clarifying such associations (SIMRA, 2017[1]), above all in rural areas where ecosystems and their products and services are often more evidently utilized. Therefore, for the two aforementioned areas of innovation, corresponding framework definitions will be used for their elaboration in the final assessment. For the first context, a business context, a framework of business innovation will be incorporated. It is generally accepted that business-innovation is connected with making profits (Pol & Ville, 2009), and so, for this we adopted the definition by Sawhney *et al*., (2006, p. 76) as follows; "**the creation of substantial new value for customers and the firm by creatively changing one or more dimensions of the business system**". For the second context, that of social innovation, it is important to note that defining social innovation is not as straightforward as defining business innovation, indeed, Pol & Ville, (2009, p. 12) who distinguish social innovation and business innovation, highlight this ambiguity in social innovation stating it "*is a term that almost everyone likes, but nobody is quite sure of what it means*". However, the rising importance of social innovation can be seen in the other European With this in mind, to cover this ambiguity, for the second context, we adopted a framework developed by Bosworth *et al*., (2016, p. 5), as follows: **New outcomes: new businesses, organizations, services or products; New approaches to value creation and policy/service delivery; New people involved and shifting control of processes; Serving the breadth of society: responding to social needs (local demand); Maximizing the use of local resources, including human and social**.

1.3 Nature-based businesses and their key thematic areas

Business is defined by the Oxford English Dictionary (2017) as "*the activity of making, buying, selling or supplying goods or services for money*". While our assessment is of the innovation degree of businesses, it is important to define the sector to which these businesses apply. The businesses assessed in our study are focused on Marketing and Economics of Ecosystems and Biodiversity (MEEB) and so are driven by the inputs of "ecosystems and biodiversity". To bring ecosystems into a "business" and "marketing and economics" context, we need to define the services that they offer. One classification that defines these services is that of the Common International Classification of Ecosystem Services (CICES, Roy Haines-Young & Potschin, 2013), that categorizes the services into three types: provisioning, regulation and cultural. It is evident that the common theme across these three services types, and biodiversity, is "nature". In line with this, as market-based instruments are considered a key alternative to traditional policy mechanisms in this report, they are viewed, in this context as offering "solutions". Consequently, we also adopt a "nature-based solution" approach to the selection of businesses, where "*Nature-based solutions aim to help societies address a variety of environmental, social and economic challenges in sustainable ways. Nature-based solutions use the*

[1] Social Innovation in Marginalized Rural Areas (SIMRA), started in 2016, is a project funded by the European Union's Horizon 2020 research and innovation action programme. SIMRA seeks to advance understanding of social innovation and innovative governance in agriculture, forestry and rural development, and how to boost them, particularly in marginalised rural areas across Europe. For more information and details on joining the SIMRA community, please visit www.simra-h2020.eu.

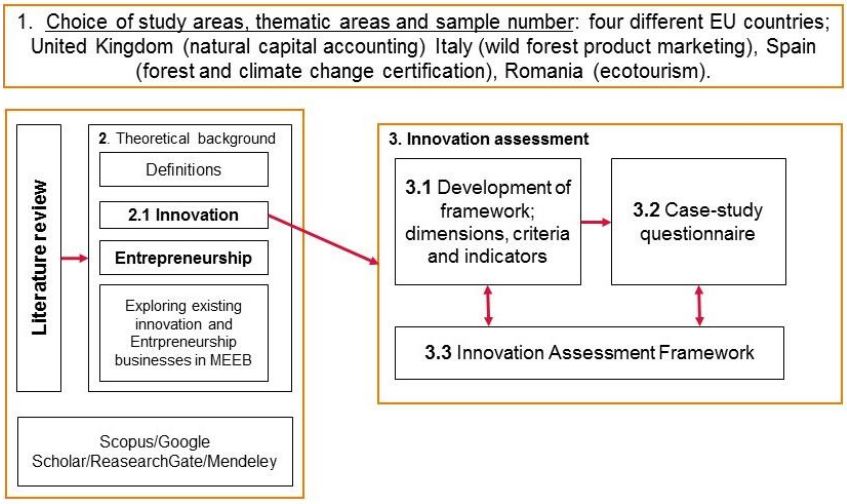
features and complex system processes of nature. This implies that maintaining and enhancing natural capital is of crucial importance, as it forms the basis for solutions. These nature-based solutions ideally are resilient to change, as well as energy and resource efficient, but in order to achieve these criteria, they must be adapted to local conditions" (European Commission, 2015, p. 6). Therefore, for the purposes of this report and building on the definition provided by the EC and the CICES classification, the business category type will be classified as "**Nature-based businesses**" previously defined as **nature-based businesses are socio-economic initiatives that make profit by marketing, promoting and enhancing biodiversity and ecosystem services**. Incorporating this definition, and basing it on the three ecosystem services defined by CICES, and natural capital and biodiversity, requires a need to establish associated areas for the different services: thematic areas.

Considering the goods (in natural capital and biodiversity) and services provided by ecosystems, and their commoditization, innovative ways of ensuring the sustainable provision of these goods and services have been established in recent years. For the purposes of this report, four business type areas, corresponding to the 3 categories of ecosystem services and biodiversity, were defined as thematic areas. The first service area adopted for this study will be that of **Natural Capital Accounting**, within this area, as was discussed previously, evidence of the actual role of the public sector in EU member states is higher in areas defined as innovative, such as PES schemes (especially when involving publicly owned natural resources), and lower in the private sector (Forest Trends, 2014). However, in recent years, there is growing evidence that the private sector and biodiversity and ecosystem services (BES) are receiving new attention (Lambooy & Levashova, 2011). This could be because of the increasing number of new investment opportunities in BES (Abbott *et al*., 2002; Lambooy & Levashova, 2011), also due to new markets in, for example: carbon emission rights, Reducing Emissions from Deforestation and Forest Degradation (REDD+) projects (Corbera & Schroeder, 2011; Hajek *et al*., 2011) and water rights (some PES schemes). To this end, capital is described by Costanza *et al*. (1997) as the stock of an amount of materials or information (also goods and services) that exist at a point in time, adding sustainability to the provision of these goods and services from the natural world, gives natural capital. Natural capital accounting are the tools that help measure the full extent of a country's natural capital (WAVES, 2012) in all the aforementioned examples of BES. The second service area will be that of **Wild Forest Products Marketing**, where a "*wild forest product is an edible plant or mushroom and parts thereof, for human consumption, which grow naturally in forests and are not cultivated using agricultural methods, but collected where it carries out its biological cycle*" (CERES, 2014; Pettenella et al, 2016). The third service area will be that of regulating through certification, **Forest and Carbon Certification**, where certification is defined as "*the process whereby an independent third-party (called a certifier or certification body) assesses the quality of forest management in relation to a set of predetermined requirements (the standard). The certifier gives written assurance that a product or process conforms to the requirements specified in the standard*" (Rametsteiner & Simula, 2003, p. 88). Finally, the last area is that of the recreational and cultural services, **Ecotourism**, where the definition for this will be defined by The International Ecotourism Society (TIES) as "*Responsible travel to natural areas that conserves the environment and improves the welfare of local people*" (The International Ecotourism Society, 2006, p. 2).

2. METHODOLOGY

The methodological approach is presented in Figure 2.1. Considering that this is a preliminary study, the first of its kind on nature-based business innovation, the first step (Figure 2.1 - part 1) was to define the study areas, the thematic areas and the number of initiatives to be assessed. Then, a literature review on Scopus, Google Scholar, ResearchGate and Mendeley was carried out to give the background (Figure 2.1 - part 2) into innovation and entrepreneurship. Finally, this led to the definition of the framework dimensions, criteria and indicators (Annex), the case-study questionnaire (and for the innovation assessment itself (Figure 2.1 - part 3). Figure 2.1 - parts 1 and 3 will be described further in the next sections. Figure 2.1 - part 2 and have already been elaborated in the introduction.

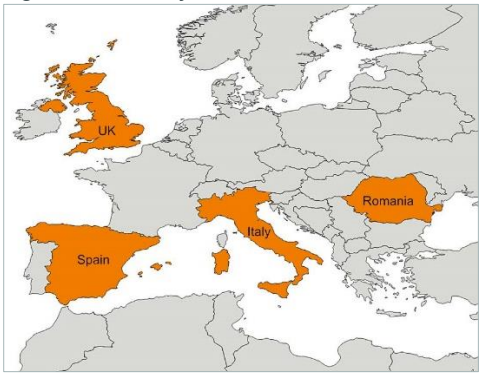
Figure 2.1 - Methodological approach of the Innovation assessment



2.1 Study areas

The study was carried out under the framework of the ECOSTAR project. As the project focus is on a EU-wide scale, the study area was composed of the four project partner countries (Figure 2.2).

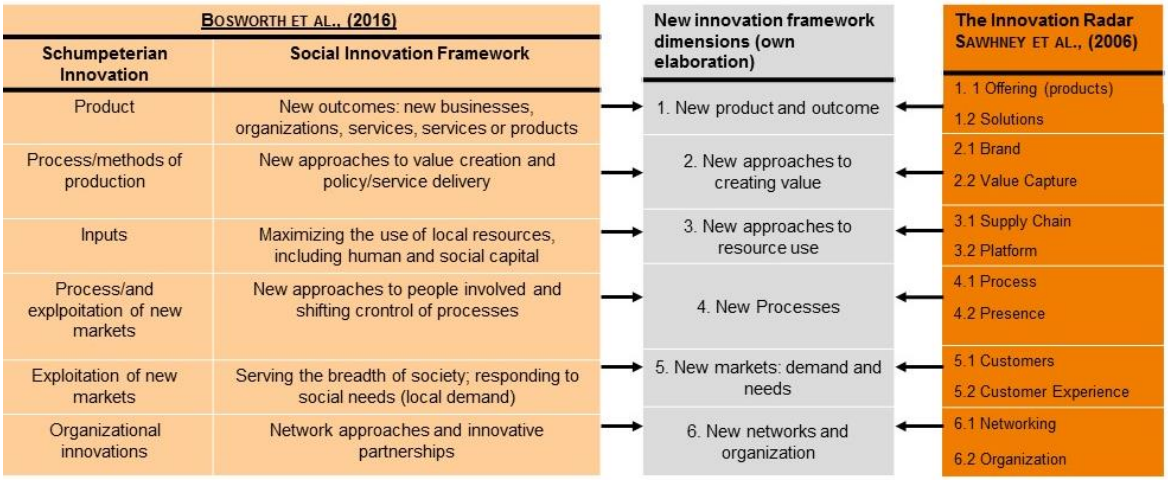
Figure 2.2 - Study area countries



2.2 The new framework definition for innovation

The new framework for the development of the dimensions to assess the different degrees of innovation, was based on the previously elaborated framework definitions presented in Section 1, and are summarized as follows: combining a framework for social innovation developed by Bosworth *et al*., (2016, p. 6) with a framework for business innovation called “the Innovation Radar”, developed by Sawhney *et al*., (2006, p. 76), a new framework for innovation was established. The Innovation Radar criteria will also be used as the criteria in the assessment of innovation for this report. Each of these frameworks are presented in Figure 2.3.

Figure 2.3 - Innovation definitional frameworks: dimensions and criteria



2.3 Selection criteria

Business models were selected based on the direct management of one or more identified ecosystems (forests, wetlands, etc.), using an ecosystem approach to facilitate/support the production, delivery and marketing of well-defined ecosystem services, such as climate mitigation, increase water quality, recreational services, and the provision of wild forest products (please refer to CICES, 2016). The case study business model selection was based on the five main factors reported in Table 2.1.

Table 2.1 - Breakdown of factors for initial choice of nature-based business models

#	Factor description
1	Success of their business models (based on the annual turnover of the business and consequently its financial sustainability).
2	Affinity with the concept of MBIs for biodiversity and ecosystem services conservation (such as PES, certification, labelling and marketing, etc.).
3	Level of general sustainability of the model (positive and negative impacts and outcomes were investigated from a social, economic and environmental perspective).
4	Level of innovation of the business model (defined by the new framework).
5	Level of reinvestment in natural capital or on particular ecosystem services.

2.4 Selected sample

Forty business initiatives were chosen by dedicated experts of the thematic areas as the overall sample number, ten initiatives for each thematic area and corresponding country; forty were selected to give enough initiatives to select the final target number, sixteen. From the forty initiatives, sixteen of the most outstanding were then selected by the same experts based on the aforementioned selection criteria (Table 2.1), and incorporating the newly developed innovation framework based on the dimensions, criteria and indicators in Figure 2.5. Once divided into the four thematic areas, each thematic area was also represented by one of the four study area countries (Figure 2.2). As a result, there were four business initiatives per thematic area and per country, a number chosen as it allowed for the general trends of the innovation assessment tool to be visualized easily and comparatively across the regions and thematic areas.

2.5 Thematic areas

The choice of the four thematic areas is broadly based on a corresponding ecosystem service and natural capital and biodiversity, the reasons for this are threefold: 1) the four thematic areas relate to the three classified groups of ecosystem services (CICES, 2016), and biodiversity; regulatory; cultural and provisioning; and natural capital and biodiversity, thus making classification more simple. They are also based on the classification of MBIs in use for ecosystem services (Pirard & Lapeyre, 2013); 2) The second reason is that they represent a fundamental part of the problem, that is, in summary, they represent the natural resources themselves being overexploited or managed in a suboptimal way, also due to the failure of traditional top-down approaches in policy (see Section 1). The inclusion of MBIs alongside the choice of thematic area, highlights the growing importance and success of MBIs and their bottom-up approaches; 3) Finally, biodiversity and ecosystem services constitute some of the most valuable intangible assets on earth and forests could be considered the most precious natural capital in Europe (Boyd & Banzhaf, 2007; Costanza *et al*., 1997; Gómez-Baggethun *et al*., 2010).

The choice of allocation of the countries to their thematic areas was based on their affiliation as project partners and their overall expertise and experience in that area.

With this in mind, the four thematic areas are presented as follows: 1) Natural Capital Accounting; 2) Wild Forest Products Marketing; 3) Forest and Carbon Certification; 4) Ecotourism. The affiliation between biodiversity and ecosystem services (BES), the MBIs and the thematic areas is explained in Figure 2.4. A new table representing the countries and their associated thematic areas is presented by Table 2.2.

Figure 2.4 - BES areas, MBIs and thematic business areas

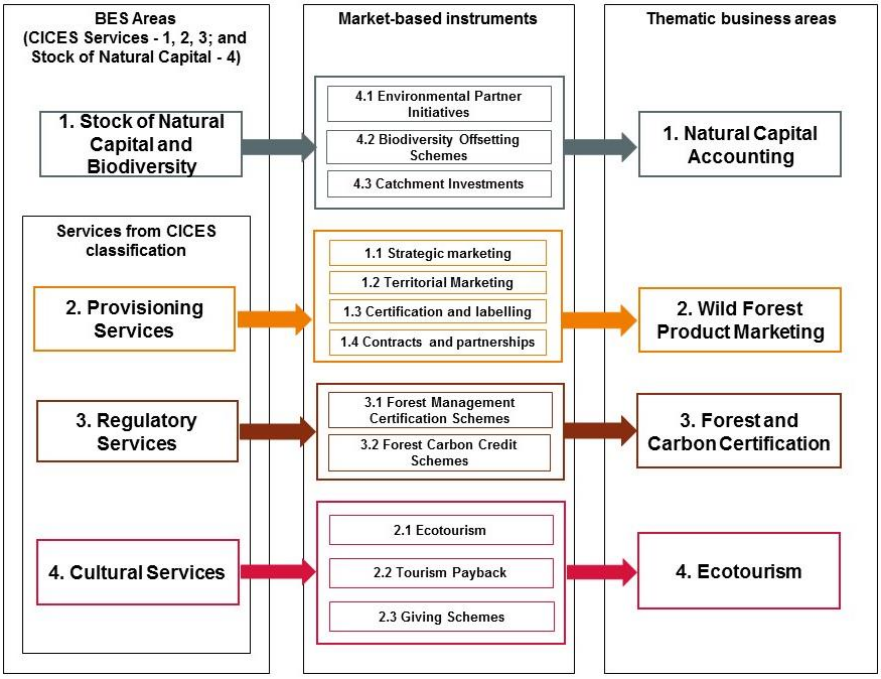


Table 2.2 - Study areas and their associated thematic areas

#	Country	Thematic area
1	UK	Natural Capital Accounting
2	Italy	Wild Forest Products Marketing
3	Spain	Forest and Carbon Certification
4	Romania	Ecotourism

2.6 Selection of business initiatives

The final choice of the selected nature-based initiatives was based on the factors described in Table 2.1; their affinity with their thematic area, association to BES area – based on the CICES classification, and MBI employed – based on Pirard & Lapeyre, (2013) classification for MBIs in use for ES. A summary of this selection is presented in Table 2.3, and a short description of each initiative is also presented, for more information on each business initiative.

Table 2.3 - The sixteen nature-based businesses selected for assessment

BES area	Type of MBI	Instrument	Thematic area	Initiative name	Location	Short description
1. Stock of natural capital and biodiversity	Coasean-type agreements	Catchment investments/ Biodiversity offsetting schemes	**1. Natural Capital & Biodiversity**	First Milk	The United Kingdom	Nutrient runoff reduction to promote sustainable dairy farming
	Direct markets	Environmental accounting initiatives		Kering		Environmental impact assessment for all operations along the entire supply chain
	Coasean-type agreements	Environmental accounting initiatives		National Grid		Assessment tool to help understand the value of natural capital on the national grid estate
	Reverse auctions	Catchment investments		Upstream Thinking		Flagship environmental programme and model PES scheme
2. Provisioning services	Direct markets	Certification & labelling	2. Wild Forest Products Marketing	Fungo di Borgotaro	Italy	Boletus mushroom picking in coppice forests
	Direct markets	Certification & labelling		Bergila		Production of organic medicinal and aromatic plant products from the wild
	Direct markets	License fees		Magnifica Comunità di Fiemme		Wild mushroom picking in Alpine forest community
	Voluntary price signals	Certification & labelling (from standard)		Trentinerbe		Standard available to companies interested in medicinal and aromatic plant production in Trentino
3. Regulation services	Voluntary price signal	Certification & labelling	3. Forest and Carbon Certification	Adeheco	Spain	FSC group certification for cork oak forestland owners and managers, as well as organic livestock farmers.
	Tradable permits	Certification & labelling		Biomasa Forestal		Wood pellet production with sustainable biomass partnership (SBP) certification
	Tradable permits	Forest Carbon credits schemes		Refo-resta CO_2		Ecosystem restoration through carbon emission compensation mechanisms

	Direct Markets	Direct fees, Certification & labelling and carbon credit schemes		Treedom		Online platform where you can plant a tree and follow it online. Promoting Corporate Social Responsibility
4. Cultural services	Direct Markets	Ecotourism; park fees	4. Ecotourism	Parc Aventura	Romania	First outdoor forest adventure centre in Romania, offering a range of outdoor activities
	Direct Markets	Ecotourism; park fees		Equus Silvania		Horse-riding centre offering a variety of outdoor activities in the wild
	Direct Markets	Ecotourism; park fees		Libearty		Largest bear park and sanctuary in Europe
	Direct Markets	Ecotourism; park fees		Ultima Frontiera		Nature reserve, part of the Skua Nature network, where a range of recreational activities can be carried out

2.7 Data collection

All the data that was needed for the assessment was obtained from case-study questionnaires, the company websites and ECOSTAR website company factsheets. The questionnaires were disseminated to the four ECOSTAR partners in Italy, Romania, Spain and the UK, and filled in by collecting secondary information and interviewing the selected businesses.

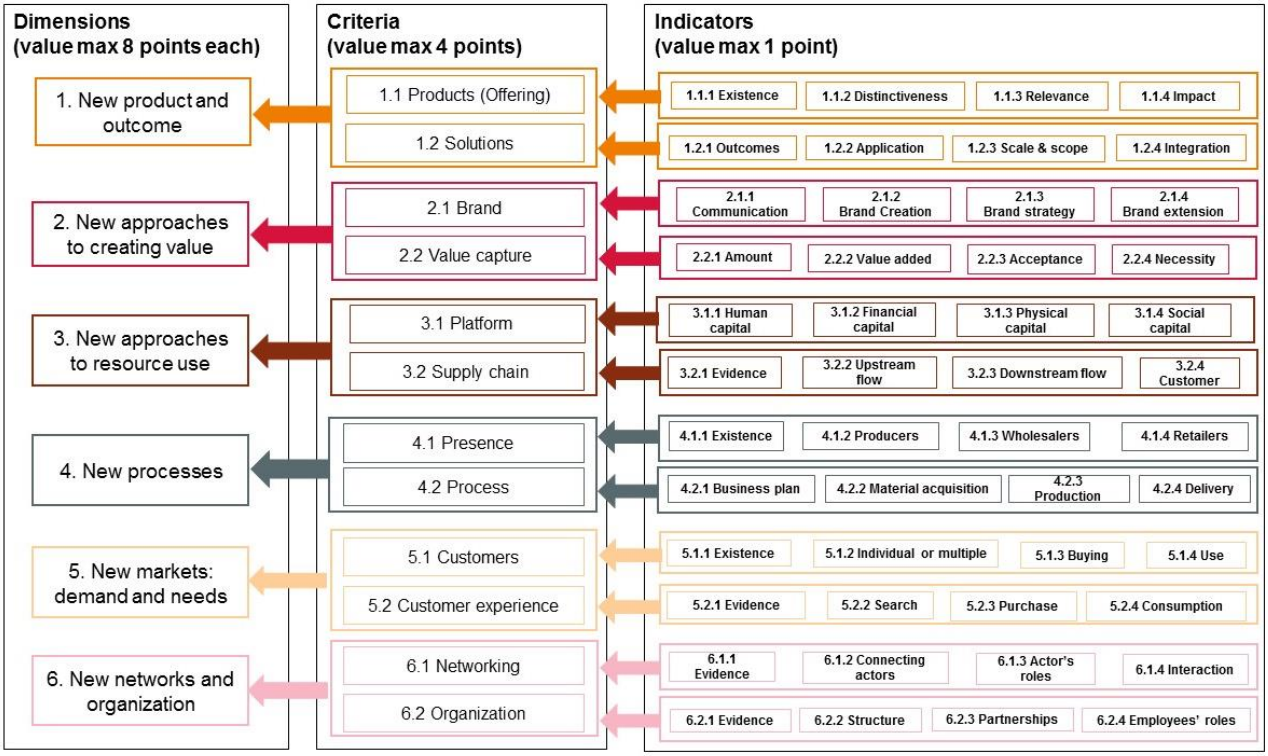
For every indicator, there was a corresponding indicator question from the questionnaire. The information was extracted from the indicator questions on the questionnaire, the company websites (and GOOGLE) and the ECOSTAR website company factsheet.

2.8 Innovation assessment framework

Innovation levels for each of the nature-based businesses were assessed based on the six dimensions defined in Figure 2.3. The six dimensions were subdivided based on the 12 elements (criteria) of the innovation radar (Sawhney *et al.*, 2006): 2 criteria were identified for each dimension. The allocation of the two criteria to each dimension was based on the relevance of the criteria to that dimension. For each criterion, four indicators were defined. Indicators were obtained following a thorough review of the literature on each of the individual criterion. In general, the four indicators chosen for each criterion were based on a first indicator of "existence or evidence" of that criterion, followed by the three most relevant indicators from the definition of that criterion from the literature. A table elaborating explanations of the dimensions and criteria into indicators, and their associated references, can be found in Annex 2.

Each indicator carried a score of one point to a maximum weight of four points per criterion: the higher the score, the higher the innovation associated to each criterion. The weighting was obtained using dichotomous questions for each of the indicators. Therefore, each dimension carried a maximum score of eight points. The indicators, criteria and dimensions are presented in Figure 2.5, while Table 2.1summarizes innovation performance levels defined for the study. A more detailed explanation of this can be found in Annex 2 - Indicator and criteria key.

Figure 2.5 - Dimensions, criteria and indicators used for the assessment



After the evaluation and tallying of scores of each individual business, performance levels were established and allocated. The performance levels were allocated as percentages in correspondence with the resulting tally of the indicators.

Table 2.4 - Innovation performance levels

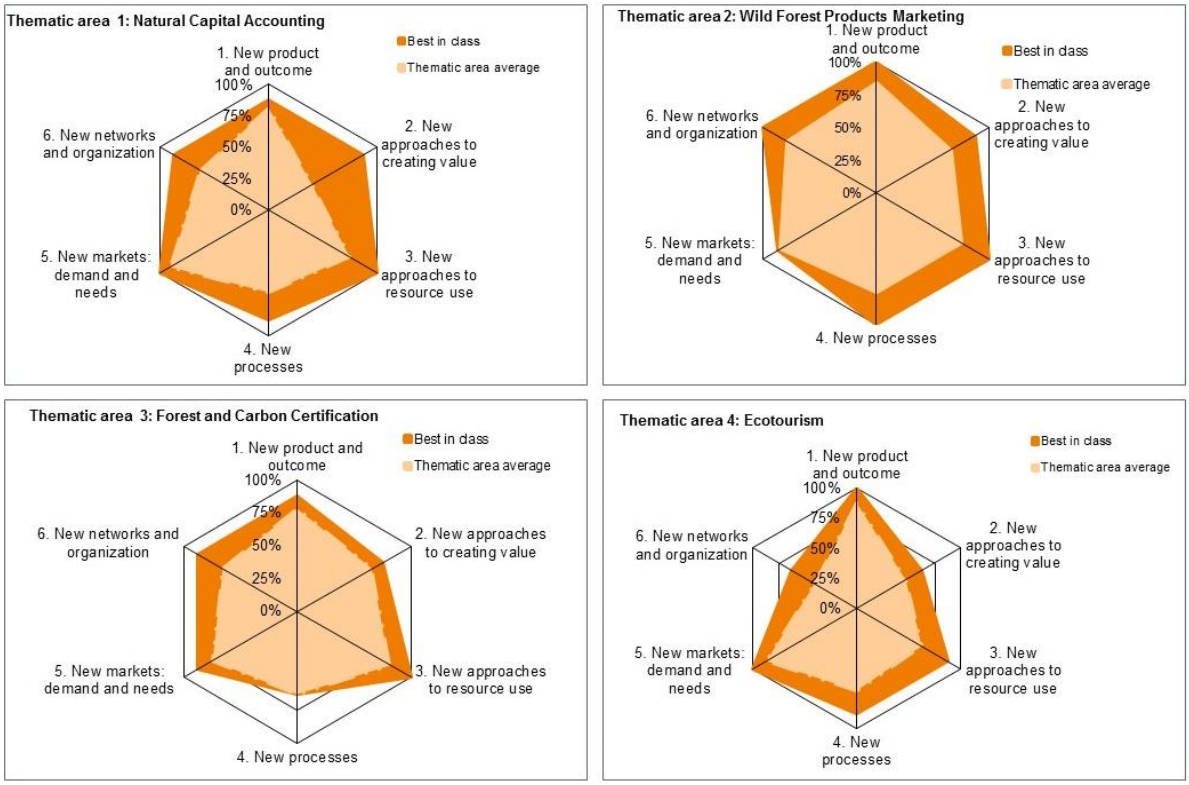
Indicator tally (total = 48)	Performance (%)	Performance level
37-48 points	76-100	Very good performer
25-36 points	51-75	Good performer
13-24 points	26-50	Poor performer
0-12 points	0-25	Very poor performer

3. MAIN FINDINGS

3.1 The level of innovation per thematic area

Considering the number of final initiatives assessed, the analysis focuses more on qualitative general trends and comparisons based on the results of the dichotomous questions used for the indicators rather than drawing conclusions from central tendencies, variances and associated statistical analysis. It is important to note here that for a clear understanding of the definition and use of each indicator and criterion, a key has been developed and is available in the Annex 2. Figure 3.1 below, presents the resulting levels of innovation for the best in class and the thematic area averages based on the six dimensions used for the assessment. Best in class is the representation of the maximum scores for innovation of the combined initiatives.

Figure 3.1 - Breakdown of levels of innovation for best in class compared to sector average for each of the four thematic areas



Performance levels of innovation for each of the six dimensions were subjectively defined as reported in Table 2.1. Considering the thematic area averages, there are no very poor performers. These changes slightly when the next level of performance is considered; poor performer, for which the sector average for thematic area four, Ecotourism, scored 26-50% for innovation dimensions two (New approaches to creating value) and six (New networks and organization). There was one other poor performer in sector averages for thematic area one, Natural Capital Accounting, which also scored 26-50% for dimension two. All four thematic areas have innovation dimensions with sector averages that can be considered of the highest performance; very good performer (76-100%). These include for thematic area two – Wild Forest Products Marketing – for innovation

dimensions one (New product and outcome), five (New markets, demands and needs) and six (New networks and organization). For thematic area four – Ecotourism – the two innovation dimensions that are scored as "very good performer" are also one and five. For thematic area three, one innovation dimension can be considered as being a very good performer; New product and outcome. Finally, there are two in thematic area one - Natural Capital Accounting – these include dimensions one and five. All other innovation dimensions for the sector averages for each of the four thematic areas can be considered as "Good performers" (51-75%). This translates into an overall good performance of innovation for all thematic areas.

It is evident that when taking the "Best-performing initiatives" into consideration for each thematic area, the effect that their scores have on the sector averages changes the score greatly in some cases. This is evident, above all, in the cases, for thematic area one; Natural Capital Accounting, which could be the difference between a potential very poor performance of the sector average for innovation dimension "New approaches to creating value", and the actual score of poor performer. This is also the case for thematic area two, Wild Forest Products Marketing. The best and poorest in classes for each of the thematic areas are presented in Table 3.1.

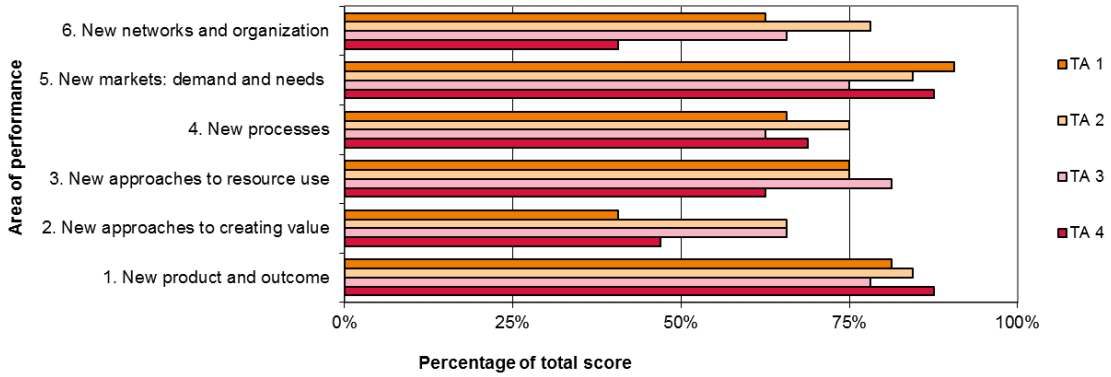
Table 3.1 - Best initiatives class and thematic area average for each thematic area

Thematic area	Best-performing initiatives	Overall score %	Poorest initiatives in class	Overall score %
Natural Capital Accounting	Upstream Thinking	71	National Grid	50
Wild Forest Products Marketing	Fungo di Borgotaro	79	Magnifica Comunità di Fiemme	57
Forest and Carbon Certification	Adeheco	64	Refo-resta CO_2	50
Ecotourism	Parc Aventura	65	Equus Silvania	47

3.2 Level of innovation per dimension

If the innovation is considered in terms of the six dimensions defined in Figure 2.3, there are some trends that evidently fall into the same performance level categories. The dimension where the least innovation takes place, falling into the "poor performer" category in all thematic areas, is dimension two - New approaches to creating value -. The reason for this was the clear lack of marketing strategies, in terms of brand creation, brand strategy and brand extension for almost all thematic area types. The dimensions three and four clearly fall into the "good performer" category for all thematic areas. This is also the case for the dimensions one (New product and outcome) and five (New markets, demand and needs), which both fall into the "very good performer" category, this means that these are the dimensions where most innovation is taking place. Finally, dimension six (New networks and organization) had some variation in its result with thematic areas, falling into three performance categories; poor performer, good performer and very good performer. These results are summarized and presented in Figure 3.2 and will be explained in more detail in the next sub-sections.

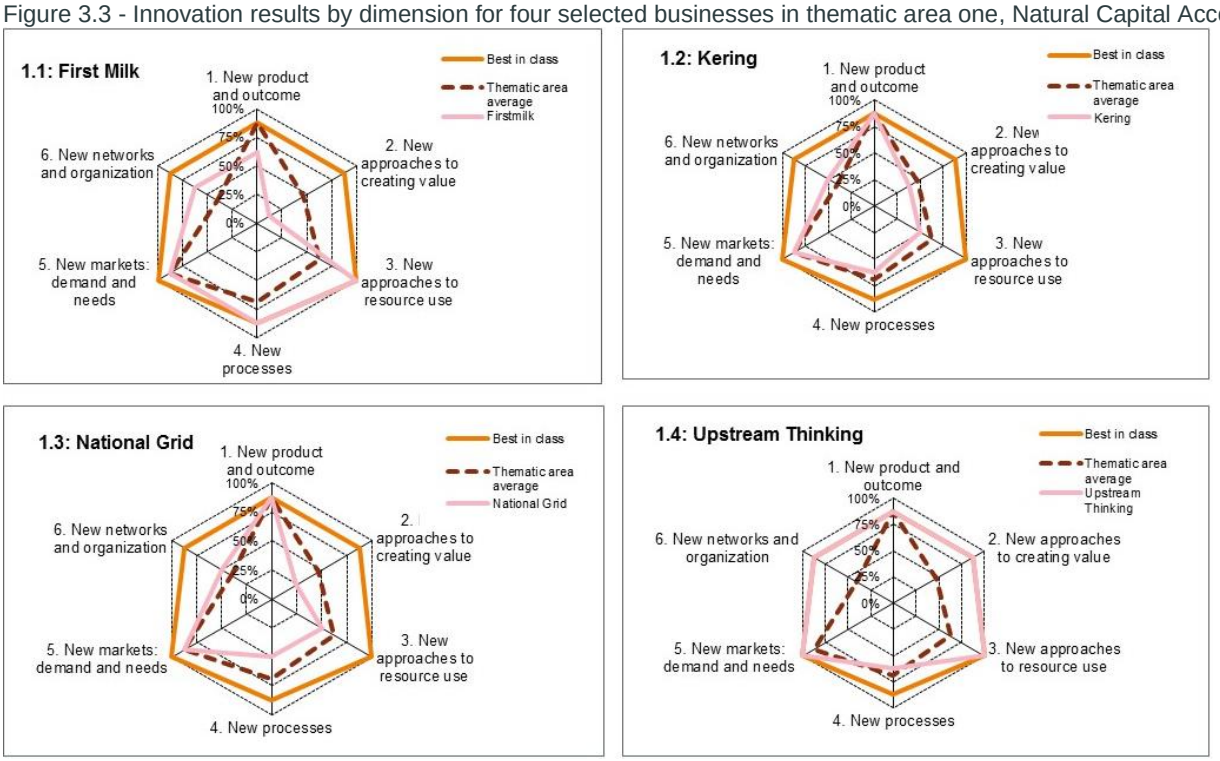
Figure 3.2 - Thematic area (TA) performances against innovation dimensions (broken into performance levels based on % of total score)



3.3 Innovation in Natural Capital Accounting

Thematic area one was the area with the greatest variation in terms of performance of innovation (Figure 3.3). There was one very good performer, Upstream Thinking, which scored very well (76-100%) in all dimensions except four. The high score is because Upstream Thinking performed well across all criteria; it offers an innovative "Product" and "Solution" (indicators; "distinctiveness, relevance, impact, outcomes, application and integration", respectively), it has a strong "Brand" (with indicators "Communication, Brand Creation, Strategy, and Extension) and "Value Capture" is clearly evident (all indicators). It has a strong "Platform" (with high scores in indicators across all "Capital" types) and a clear "Supply Chain" (clear upstream and downstream flows of final products). There were also good scores for criteria "Customers" and "Customer Experience" (across all indicators), translating into evidence of many customers, and much buying and consumption of the products. There were similar scores with criteria "Networks" and "Organization". The only poor performer for Upstream Thinking was with dimension four (New processes), above all for poor results in criterion "Presence" (more specifically due to indicators "Wholesalers" and "Retailers"). All other initiatives resulted as being good performers across all dimensions with the exception of National Grid and First Milk. Both National Grid and First Milk scored similarly, both scored very poorly in dimension two (New approaches to creating value); 0-25%. This translates into poor performances in criteria "Brand" and "Value Capture" due to the low scores in indicators "Brand Creation, Strategy and Extension" - lack thereof - and "Value Added" lack of awards. For detailed explanations of each indicator, see Annex 2.

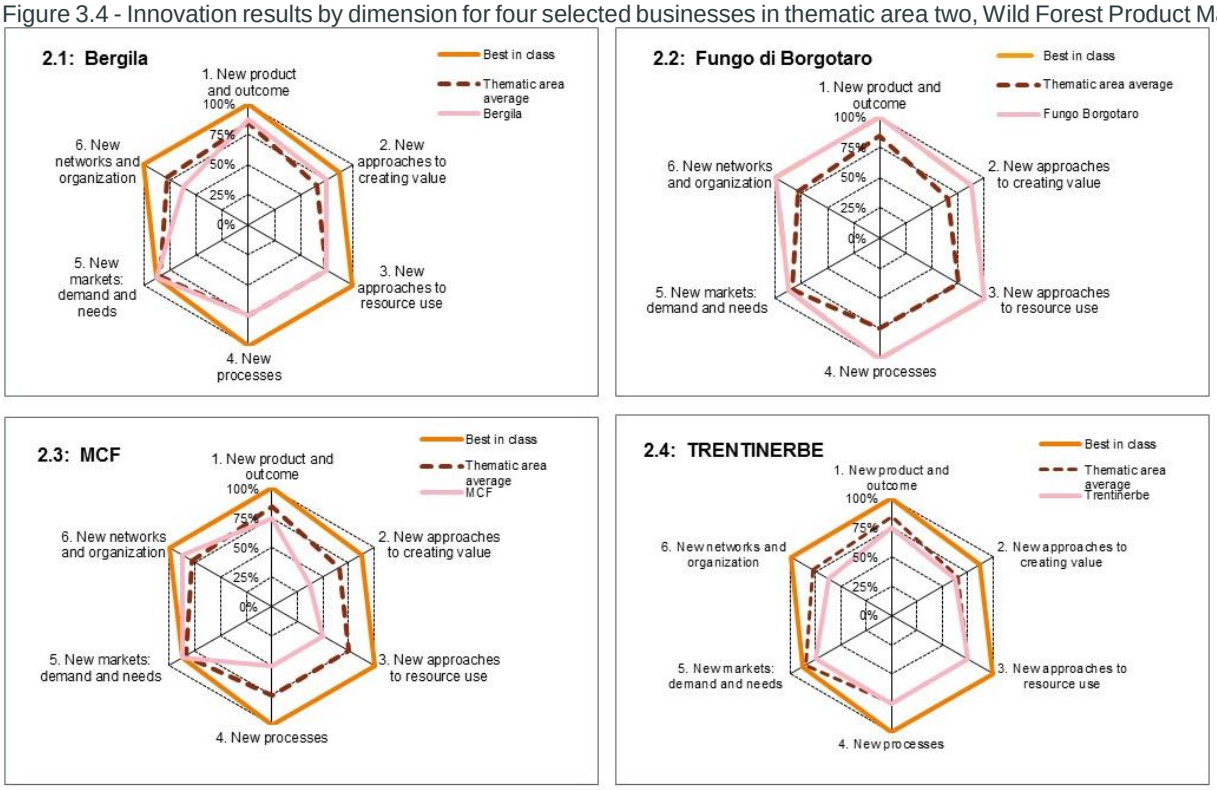
Figure 3.3 - Innovation results by dimension for four selected businesses in thematic area one, Natural Capital Accounting



3.4 Innovation in Wild Forest Product Marketing

The levels of innovation between the four initiatives in thematic area two vary greatly (Figure 3.4). Within this thematic area, Fungo di Borgotaro resulted as not only the most innovative for thematic area two, but also as the most innovative of all initiatives assessed. It was the only initiative scoring as “very good performer” in all criteria, and therefore dimensions, based on performance levels in Table 2.4. Indeed, if these scores are analyzed in terms of the criteria (from Figure 2.5), Fungo di Borgotaro resulted as being highly innovative in all areas except criterion “Value Capture” and “Customer Experience” where it missed indicators “Value Added” and “Evidence” respectively. In both cases, this was due to the fact that the initiative has not yet won any awards. The least performing initiative resulted with Magnifica Comunità di Fiemme (MCF), while scoring as a “very good performer” in dimensions five (New markets, demands and needs) and six (New networks and organization) and “good performer” in dimension one (New product and outcome), dimensions four (New processes) and two (New approaches to creating value) scored as “poor performer” and dimension three (New approaches to resource use) scored as having a “very poor performance” in innovation. When these were analysed further, MCF resulted as a poor performer due to the low scores in criteria; “Brand”, “Supply Chain” and “Presence”, where it missed all indicators for each excluding “customer” (for “Supply Chain”) and “Wholesalers” and “Retailers” (for “Presence” - see Figure 2.5 for criteria and indicators). This means that MCF lacked innovation in these criteria. The other two initiatives, TRENTINERBE and Bergila, resulted as having primarily good performance levels in innovation across the six dimensions. For detailed explanations of each indicator, see Annex 2.

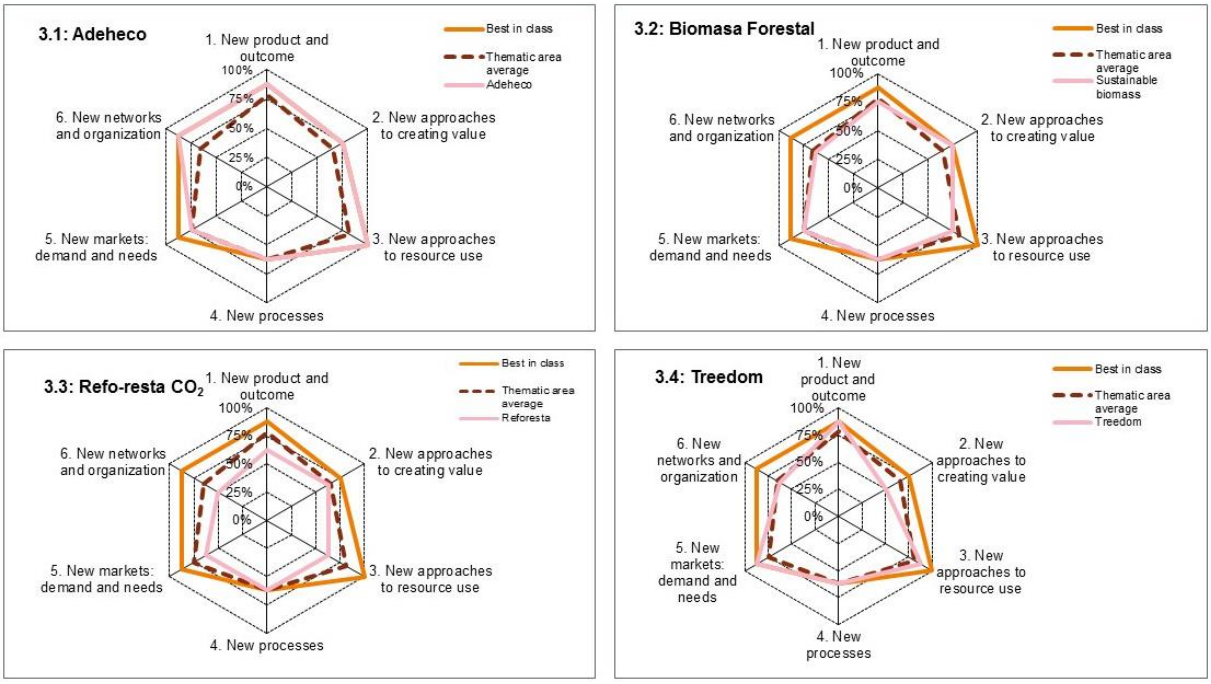
Figure 3.4 - Innovation results by dimension for four selected businesses in thematic area two, Wild Forest Product Marketing



3.5 Innovation in Forest and Carbon Certification

The businesses assessed for thematic area three have quite average areas of innovation overall. All four assessed businesses resulted as being “good performers” for innovation falling into a range of 51-75% (Figure 2.5). The only outstanding performer for innovation in this thematic area was Treedom, which scored very well in dimensions one (New product and outcome), three (New approaches to resource use) and five (New markets, demands and needs). Criteria that performed well in these dimensions included “Products” and “Solutions” in dimension one; with indicators such as “relevance”, “distinctiveness”, “impact” and “scale and scope”, which translates into an initiative with good outcomes and impacts. Then, in dimension three; the indicators relevant to “supply chain” and “platform” such as “upstream and downstream” flows and all capital types scored highly, and in dimension five there was high evidence of innovation in criteria “customers” and “customer satisfaction” due to scores from indicators such as evidence of a range of customers, “consumption” and satisfaction from the due to high turnover, popularity from the “search” and “use”. Also, Adeheco scored well and resulted as the best initiative in class, differently to Treedom it had high scores in dimensions three and six (New networks and organization). For dimension three, the high result was due to good scores in a good supply chain and platform (with evidence of all capital types see Figure 2.5), whereas for dimension six the high result came from the good scores in both networking (“connecting actors”, “actor’s roles” and “interaction”) and organization (all indicators). For detailed explanations of each indicator, see Annex 2.

Figure 3.5 - Innovation results by dimension for four selected businesses in thematic area three, Forest and Carbon Certification

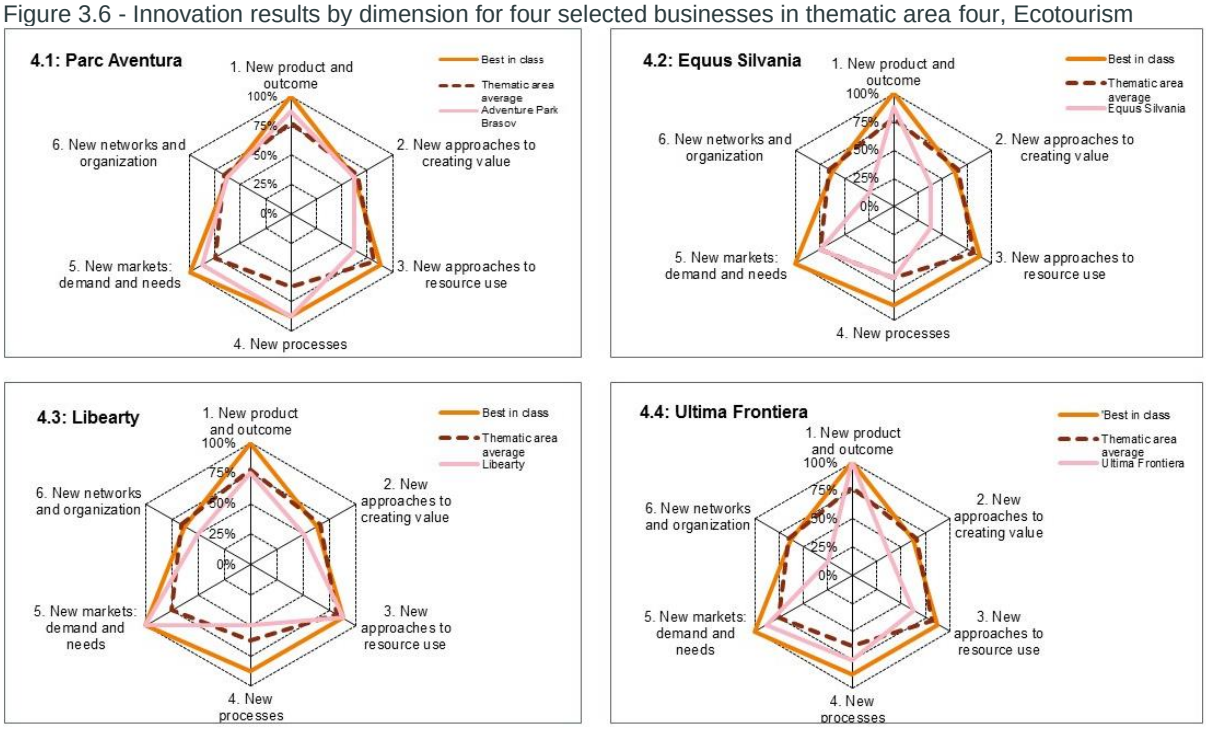


3.6 Innovation in Ecotourism

When graphed, the assessment of innovation for thematic area four presents some very interesting features. Indeed, the resulting profiles of all initiatives (specifically Ultima Frontiera and Equus Silvania) have comparatively similar shapes (Figure 3.6) in their levels of innovation. All scored poorly or very poorly in innovation in dimension six (New networks and organization); due to low scores in criteria “Networking” and “Organization” (specifically with indicators “actors”, “partnerships”, “actors roles” and “employees roles”). This translates into poor innovation scores in these criteria. There were also poor scores across all initiatives in dimension two (New approached to creating value), this was as a result of having poor scores specifically in criteria “Brand”, but also in “Value Capture”, where the poor performing indicators were with indicators “Brand Creation, Strategy and Extension” (for criterion “Brand”) and with indicator “Value Added” (for criterion “Value Capture”), due to lack of awards for all initiatives. However, overall, they scored well in dimensions one (New products and outcome) and five (New markets, demands and needs) across all criteria, with the remaining dimensions falling between poor performance and good performance in innovation across all criteria. The initiative with the best performing dimensions in innovation is Parc Aventura, which differs slightly from the others with its good performance in dimension six, due to scores in criterion “Value Capture” (specifically, indicators; “Amount, Acceptance and Necessity”) and good performance in innovation in dimension three (New approaches to resource use). The high scores for Parc Aventura were obtained in dimensions one and five due good performances with all indicators. This translates into a good performance in innovation for criteria “Products, Solution, Customer and Customer Experience”. The only other outstanding difference was with Libearty scoring very well in dimension three due to full scores in criteria “Platform” and “Supply Chain”,

translating into evidence, and consequently, innovation of all capital types for criterion “Platform” (indicators: human, financial, physical and social capitals), and indicators associated with “Supply Chain”. Libearty also scored well in dimension five, with high scores in innovation across all indicators for this dimension. For detailed explanations of each indicator, see Annex 2.

Figure 3.6 - Innovation results by dimension for four selected businesses in thematic area four, Ecotourism



4. CONCLUSION

This preliminary assessment has provided a clear evaluation of the levels of innovation in the four thematic areas. The four thematic areas provide a good example of sixteen, from forty, of the most innovative nature-based businesses that exist in the field of MEEB, in the chosen regions. While we are aware that the list of case studies selected for this research does not cover the whole spectrum of ongoing initiatives, we are confident that they are representative of some of the most innovative initiatives in the EU region. Additional examples might be found in other EU countries, not included within the project, and, of course, extra ones are likely to be found in non-EU countries.

Considering that most of the businesses assessed, scored a level of "good performance" innovation and higher, this shows the high level of innovation potential in the four thematic areas, and consequently, in MEEB overall as a sector for innovation. It is evident that there is room for innovation improvement and there are some clear examples where thematic areas and their corresponding countries are weaker, with poorer innovation performance, based on the dimensions and criteria assessment. Conclusions on good and poor performers can be drawn as follows, first based on thematic areas, and then per dimension.

Thematic areas:

- *Thematic area one, Natural Capital Accounting*, had a similar profile trend to thematic area two. That is, there was one very innovative initiative, Upstream Thinking, while the other initiatives can still be improved. The good performance of Upstream Thinking, similarly to Fungo di Borgotaro, was also due to the criteria "Brand", but, more specifically in "Networking" and "Organization", once again due to the evidence of partnerships and contact network for "Networking" and clearly defined roles for actors for organization.
- *Thematic area two, Wild Forest Products Marketing*, overall, resulted as being not only the most innovative thematic area, but it also has the most innovative business initiative of all sixteen initiatives assessed, Fungo di Borgotaro. The main reason for this resulted to be in the outstanding criteria "Brand" (due to existence and use of brands across most initiatives) and "Networking" and "Organization" (due to the clear role of other contacts and partnerships for "Networking" and the clear roles and structure of actors for "Organization").
- *Thematic area three, Forest and Carbon Certification*, while most initiatives scored well across all dimensions, a clear, visual result was visible across all initiatives doing quite well in dimension three. This means that most initiatives had innovative platforms (due to high scores in the "Capitals" – human, financial, physical and social – and in the "Supply Chain" (good upstream and downstream flows of goods).
- *Thematic area four, Ecotourism,* had clear, comparable and similar profiles, where, in most cases, all dimensions did well and badly in the same areas. When analyzed, overall, the initiatives lacked in innovation in "Brands" (in many cases none existed), and in "Networking" and "Organization" (mainly due to lack of partnerships and other contacts).

Dimensions:

- Of the six dimensions (see also Figure 3.2), the least innovation took place in dimension two, “New approaches to creating value”, once again related to the poor performance of thematic areas for the criterion “Brand” (specifically in brand creation, strategy and extension).
- In contrast, the most innovation took place in dimensions five and six, “New product and outcome” and “New markets, demands and needs” across all thematic areas. This is connected to how perceptively innovative the new product is by the initiatives, its impact and outcomes for dimension one, and its sales, use and consumption of products by customers for dimension five.

From these conclusions, it is evident that there are criteria that need to be focused on and improved in order to improve overall innovation potential, and quite probably, to the success of the new business. Indeed, considering that the nature-based businesses were from a selection of the most innovative, the most practical use, and benefit, of this assessment can be to show where a specific initiative, or area, is lacking innovation. With such knowledge, the poor performers can focus on the problematic dimension and correct it. According to Tsai (2001), it is knowing in what areas the innovation of a business or business model needs to improve that can foster and support new business development and growth.

Overall, our main results have shown that the poorest performing areas occur in the dimension “New approaches to creating value”, if this is broken down into performance per indicator, the poor performing indicators include whether or not a communication strategy exists, or evidence thereof, the creation of a business brand, having a clear business strategy, and then extending that brand to survive (Communication, Brand Creation, Brand Strategy and Brand Extension). This was clearly evident in thematic area four, *Ecotourism*. If the importance of a brand in market strategy is considered, also highlighted by Wood (2012, p. 662) brands “*can be critical to the success of companies*”, such results may indicate one reason as to why there is poor uptake of market-based instruments by new nature-based businesses for nature conservation.

Another poor-performing dimension across all thematic areas is dimension six “New networks and organization”. More specifically, these poor performing indicators occur within the sharing of networks “partnerships and contacts” and organizational structure “contacts’ and employees’ roles”. This lack of innovation in networking and organization could also give reason for the slow uptake of market-based instruments for nature conservation.

One possible solution to these areas that lack innovation, could be in the transfer of knowledge and experience. Companies that lack innovation in some areas, and know which areas, can be complimented by the companies that have business models with high levels of innovation in those areas, through business knowledge sharing. Initiatives within the same thematic areas and countries where dimensions and their innovation performance levels scored higher, for example, as was the case with Fungo di Borgotaro, could provide a transfer of knowledge and training to the initiatives that scored lower; considering the local nature and market of both initiatives, they could both benefit from increased visibility and, consequently, an increased customer base. If Fungo di Borgotaro were to share its knowledge of partnerships, its contacts (networks),

and its actors (internal and external) and employee structure (organization) to the poorest performer in the class, e.g. MCF, there could be an improvement in the performance of MCF, potentially helping it survive, last or even grow. This knowledge transfer does not need to stop only among thematic areas, considering that the criteria are applicable to all thematic areas, initiatives like Fungo di Borgotaro and Upstream Thinking could provide the knowledge necessary to the poorer performers across all thematic areas. The knowledge and skills gained and transferred from better-performing existing initiatives about increasing the focus on branding and networking, does not only need to be restricted to existing financially sustainable business initiatives, indeed, it could be applied to new initiatives through business acceleration and mentorship.

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ANNEX 1: GLOSSARY OF TECHNICAL TERMS

Business innovation

The creation of substantial new value for customers and the firm by creatively changing one or more dimensions of the business system (Sawhney *et al*., 2006, p. 76).

Ecopreneurship

An innovative, market-oriented and personality-driven form of value creation through environmental innovations and products exceeding the start-up phase of a company (Schaltegger, 2002, p. 4).

Ecosystem services

Can be defined loosely as the benefits we obtain from ecosystems (Teeb, 2009).

Innovation

Schumpeterian innovation (summarized): New products. New processes/methods of production. Exploitation of new markets. Inputs. Organizational innovations (Hagedoorn, (1996) and Bosworth *et al*., (2016)).

MBIs

Mechanisms that use direct regulation through the market, or some form of management relying on market mechanisms, is commonly put forward as the most effective way to conserve nature (Daily, 1997; Pagiola, 2004).

Nature-Based

Nature-Based Solutions and Renaturing Cities give an extensive definition on “nature-based solutions” as follows: “*Nature-based solutions aim to help societies address a variety of environmental, social and economic challenges in sustainable ways. They are actions inspired by, supported by or copied from nature; both using and enhancing existing solutions to challenges, as well as exploring more novel solutions, for example, mimicking how non-human organisms and communities cope with environmental extremes. Nature-based solutions use the features and complex system processes of nature, such as its ability to store carbon and regulate water flows, in order to achieve desired outcomes, such as reduced disaster risk and an environment that improves human well-being and socially inclusive green growth. This implies that maintaining and enhancing natural capital is of crucial importance, as it forms the basis for solutions. These nature-based solutions ideally are resilient to change, as well as energy and resource efficient, but in order to achieve these criteria, they must be adapted to local conditions*” (European Commission, 2015, p. 26). For the purposes of this thesis and based on the definition provided by the EC, the business category type will be classified as “nature-based businesses”.

Natural Capital

Capital is described by Costanza *et al*. (1997) as the stock of an amount of materials or information (also goods and services) that exist at a point in time, adding sustainability to the provision of these goods and services from the natural world, gives natural capital.

Social innovation

New outcomes: new businesses, organizations, services or products. New approaches to value creation and policy/service delivery, new people involved and shifting control of processes. Serving the breadth of society; responding to social needs (local demand). Maximizing the use of local resources, including human and social capital. Network approaches and innovative partnerships (Bosworth *et al*., 2016).

ANNEX 2: INDICATOR AND CRITERIA KEY

Each indicator carried a score of one point to a maximum weight of four points per criterion: the higher the score, the higher the innovation associated to each criterion. The weighting was obtained using dichotomous questions for each of the indicators. Therefore, each dimension carried a maximum score of eight points. In the following table, the first column presents the dimensions (8 points), the second column presents the criteria (4 points/criterion) and the last column is divided into two parts; the first part (gives one point, or not, based on any evidence of the criterion (unless otherwise stated), while the second part gives a detailed rationale behind the choice of the remaining three points relative to their criterion.

n°	**Dimension**	**Criteria** (Sawhney, Wolcott, & Arroniz, 2006)	**Indicators numbered; 1) – in the first column-, 2), 3), 4) – in the text in the second column. These numbers also indicate maximum number of points.**	
1	New product and outcome	Offerings	1) Evidence of a new offering	The offer refers to: 2) distinctiveness (of the offer); 3) relevance (of the offer to the target market); 4) category impact (defined as higher than average sales velocity – because "high sales velocity brands help grow the category overall"), and endurance (Sherlin, 2012). For the purposes of this analysis, the three indicators from this definition will be used to assess the "offer", i.e., the distinctiveness, the relevance and the category impact. The endurance is not analysed as we are assessing only the new performance of businesses at this stage.
		Solutions	1) Evidence of a new solution	Customer solutions constitute an integrated way of looking at the innovativeness of products and services. Indeed, Galbraith (2002), divides customer solutions into 4 strategic sub-categories: 2) type of solution (horizontal – applicable to different customers – or vertical – applicable to only one); 3) scale and scope (the impact scale of the solution); 4) integration (is it a single product or bundles of products), revenues (does the company's revenue only come from the solution). In this assessment, the type of solution, the scale and scope of the solution and its integration will be assessed. The revenue will be covered in criterion: new value creation.
2	New approaches	Brand	1) Evidence of a	Wood (2012) describes brands as what give companies the competitive advantage over other companies producing similar products. Due to this fact, it is important that

	to creating value		communication strategy	they are included in the dimension processes as brand processes, for example: 2) brand creation (initial idea); 3) brand strategy (development) and 4) brand extension (brand moving into other sectors) are considered under the process of marketing, which is considered as a core business process. Brands can also help identify the innovativeness of a business.
		Value Capture	1) Evidence of value creation	In the literature on both innovation and entrepreneurship (Section 2.2), value creation and new value creation came up constantly as one of the most common factors in the definitions and frameworks. Indeed, in one related study looking at the precursors to forest owner innovativeness, Nybakk *et al.* (2009) found a positive relationship between innovativeness and economic performance, that is, the higher the degree of innovativeness, the greater the economic performance. Put simply, value creation is when 2) the producers of a product give value to that product and 3) the value is accepted by the consumer (Bowman & Ambrosini, 2000) and 4) it is seen as being quite imperative to customer-client relationships in business (Walter, Ritter, & Gemuden, 2001). Considering the importance of this, it was chosen as one of the principle factors identifying innovation and entrepreneurship in the case studies assessed. It is relative to all three of the proposed frameworks for innovation. For these combined reasons, it will be incorporated, as one of the assessment criteria for innovation, into the framework used for the evaluation of innovation and entrepreneurship in the 20 chosen case-studies.
3	New approaches to resource use	Platform	See text	Considering that a platform is a set of common components that serve as building blocks for the offering (Sawhney *et al*., 2006), our study in this case will focus on the four primary sets of input resources. Inputs are any resources including human capital (people), physical capital (including natural capital, raw materials, energy, information, etc), financial capital and social capital. The greater the input, the greater the chances of success, indeed, Cooper *et al*. (1994) state that initial resources can benefit the new venture by acting as a buffer, above all, the financial resources. The four principle types of input used in this assessment are: 1) human capital is described as "*embodied knowledge and skills*" (Becker, 2016, p. 3); 2) financial capital – finances invested in the start-up of the venture; 3) physical capital (mainly natural capital) – all the physical resources (as above), and finally, social capital. Coleman (1988) describes 4) social capital as where individual or collective action is made easier by different social norms,

				interactions and networks. The inclusion of the first three factors is because they are the inputs for which many new ventures take place. Whereas, the inclusion of social capital to this list is because of the nature of the businesses that are being assessed, that is, biodiversity or ES-based businesses. Individual or collective action can be difficult, indeed, Lambooy & Levashova (2011) state that one barrier to business development in these types of businesses is the lack of information and knowledge exchange between stakeholders.
		Supply Chain	1) Evidence of value creation	Supply chains refer to "*supply chain consists of multiple firms, both upstream (i.e., supply) and downstream (i.e., distribution), and the ultimate consumer*" (Christopher, 1992; Mentzer, John T., DeWitt, W., Keebler, 2001, p. 3). For the purposes of this study, the following three indicators will be defined to assess the criteria incorporating the principle concept of "flows": 2) upstream (presence of suppliers); 3) downstream (presence of distributors) and 4) the ultimate consumer.
4	New processes	Presence	1) Evidence of presence	The presence is the channels of distribution (can be producers, wholesaler – including internet – and points of sale (retailers – including internet) utilized by an organisation that brings what is being offered to the market for the customer (Sawhney *et al.*, 2006). For the purposes of this study, the focus will be on the: 2) producers; 3) wholesalers and 4) retailers.
		Process	1) Evidence of processes (business plan)	A business process is defined as the way in which activities in business are organized, including duties and tasks of employees, and conducted (Earl, 1994; Sawhney *et al*., 2006). This criterion has been chosen as processes are core to deriving the outcomes from the inputs in business models. Innovative ways of conducting business processes, taken from the aforementioned definition include the following: acquiring supplies and other raw materials, the process of producing products or services, the process of delivering products or services to customers, and the process of providing after sales service. The three indicators of this definition will be applied to this analysis: 2) acquiring supplies and other raw materials; 3) the process of producing products or services and 4) the process of delivering products or services to customers. The final indicator – the process of providing after sales service – will be covered in the criterion "Customer satisfaction".

5	New markets: demand and needs	Customer	1) Evidence of customers	Markets, and more specifically, the demands and needs of the buyer, who is also the customer, as is the case of this assessment, is another key indicator in the analysis of both innovation and entrepreneurship in new businesses. Indeed, Oxford English Dictionaries defines the customer as "a person who buys goods or services from a shop or business". For this reason, the three indicators for these criteria are; evidence of a 2) demand or need for the new product, and consequently, 3) evidence of a buyer and 4) use of that product.
		Customer experience	1) Evidence of positive customer experience	A customer experience describes "*the total experience, including the 2) search; 3) purchase; 4) consumption; and 5) after-sale phases of the experience, and may involve 6) multiple retail channels*" (Verhoef *et al*., 2009, p. 2). This research will focus on the first three elements of this description. Customer experience shows innovation, above all, through the popularity and interest of the first three elements of this definition in relation to our study. Each of these indicators can give an idea of the level of needs and demands of the consumer, which is an important indicator of innovation success.
6	Networking and organization	Networking	Evidence of networks	Networks are defined as "*a set of connected actors that perform different types of business activities in interaction with each other*" (Holmlund & Tornroos, 1997, p. 304). As we are speaking here about a "set" of actors that perform "different types" of business activities, it is logical that different types of networks and benefits can exist, which in turn depend on the strength of the ties/connections (Granovetter, 1973). One study by Jenssen (1999), found a direct link between the "significant effect" of "social" networks on entrepreneurship. Indeed, another study by the same author suggested and proved that "*the higher the level of entrepreneurial climate in the local community, the greater the degree of innovativeness among forest owners*" (Nybakk *et al*., 2009, p. 209). For the purposes of this study, the following indicators, taken from the definition above, were incorporated: 2) set of connecting actors; 3) performing different type of business activities and 4) in interaction with each other.
		Organization	Evidence of organization	Organisations are defined by Sawhney *et al*., (2006), as the way in which a company 2) structures itself; 3) its partnerships and 4) its employee roles and responsibilities. Indeed, the three indicators numbered in this definition will be utilized for the assessment of organizational innovation for this study.

The first impact hub and accelerator for nature-based businesses

ECOSTAR is the research-enterprise impact hub and accelerator that promotes entrepreneurship and innovation for nature-based businesses. The initiative is promoted by a university-enterprise partnership between European and US-based institutions, and it is co-funded by the Erasmus+ Programme of the European Union, and other private investors.

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