Payment For Forest Environmental Services: A Meta-analysis of Successful Elements

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Summary

The forest is an ecosystem that can produce environmental services from which individuals benefit. In recent decades, the interest in these services has significantly increased and changed to meet new needs. The demand for wood has gradually become integrated into the demand for new products and services related to landscape use and recreational activities. These new products and services are defined as Non-Wood Forest Products and Services (NWFP&Ss). With this interest in services and products associated with the recreational use of forests and forest tourism, a possibility and in certain cases a need exists to introduce a system of payment for these services. The purpose of such a payment system is to respond to this demand and to promote the sustainable development and management of forests as well as diversify and increase the income of the community whose economy is based directly on forest resources. However, the transformation of forest environmental goods and services into commercial products and services is not straightforward. The transformation depends on endogenous and exogenous factors related to the forest system. Problematically, NWFP&Ss are frequently viewed as public goods. From this standpoint, they are considered free of cost to users. Therefore, to introduce a payment mechanism is difficult. However, this paper proposes to collect information on what factors can help to transform these externalities into sources of income for people living near the forests.

Keywords: payment for environmental services, forest resources, non-wood forest products and services, landscape, tourism.

JEL Classification codes: Q26, Q23.

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1. INTRODUCTION

In recent decades, the interest in the introduction of mechanisms of payment for Non-Wood Forest Products and Services (NWFP&Ss) has been steadily growing. This growing interest is due to the need to sustainably support forest development and management. The sustainable approach aims to diversify and increase the income of the community whose economy is based on forest resources[1]. The transformation of environmental goods and services associated with forests into marketable products and services is not a straightforward matter. The transformation depends upon endogenous and exogenous factors related to the forest system[2]. Various methods and operating channels have been proposed to overcome the difficulties associated with transforming forest externalities into practical income sources (Wunder, Engel and Pagiola, 2008; Pettenella and Secco, 2006; Wunder, 2005; Merlo, Milocco, Virgilietti and Panting, 2000).

A set of NWFP&Ss may be included within the benefits and recreational activities made available by landscape fruition. This group of environmental services is often regarded as public goods and therefore free of cost for users. The present study aims to collect information regarding factors capable of facilitating the transformation process of these externalities into income sources for people living near forests.

For this purpose, after a brief investigation of the fundamental requirement of a mechanism of payment for environmental services (PESs), this paper examines the interactions between forest and landscape. Next, five ways through which these interactions can be made explicit will be analyzed: the scenic beauty of the landscape and the landscape's recreational use, adventure parks, mountain chalets, mushroom and truffle gathering, specialty-use of wood sales and theme trails. Finally, those elements will be highlighted and examined that contributed positively to PES implementation.

[1] The reason for this growing interest is twofold. On the one hand, the price of timber has decreased. On the other hand, the demand for products and services not directly connected with wood resources, and the support for management policies related to rural development has been growing (Mantau, Merlo, Sekot and Welcker, 2001).

[2] Thus, certain authors (Ingold and Zimmermann, 2011) show that in Switzerland the engine of change is the sharp decline in traditional revenues from timber sales and the increased demand for other forest goods and services. Other hypotheses considered by Ingold and Zimmermann include the property of the forest (forest resources that are privately owned will be more open toward the introduction of new products and services (P&S)); the financial power of the forest owners (the greater the owners' financial resources, the greater the production of P&S); the public financial contribution to forest management (the greater the governmental contribution to forest management, the lower the production of new P&S); legal restrictions (the more legal restrictions, the lower the production of P&S); external contacts (the greater the interaction with external stakeholders, the higher the production of P&S); firm size (the larger the size of the forest in hectares owned, the greater the production of P&S); resources (the more financial resources available, the higher the presence of P&S); the independence of the forest managers from the forest owners (the greater the decision-making autonomy of forest managers, the higher the production of P&S); and promotion strategies and innovation (stronger strategic innovation leads to more production of P&S).

2. FOREST SERVICES AND PRODUCTS

From an anthropocentric perspective, the services provided by ecosystems, and thus by forests, can be generally defined as "the benefits people obtain from ecosystems" (Millennium Ecosystem Assessment, 2003). Although general, this definition views forest services and products as ecosystem processes and functions with value for humans. Thus, ecosystem services may possess a value with respect to people's needs rather than a value that is independent of those needs. This view can be criticized if an ecosystem is separated from the ecosystem's complex set of functions and features and narrowed to marketing concerns (McCauley, 2006). In fact, in certain cases, this view may underestimate the complexity of ecosystems by suggesting inappropriate uses for the high level of complexity that an ecosystem represents (Norgaard, 2010).

However, other authors welcome the opportunity to consider environmental services in terms of their value for humanity (Manning, Valliere and Minteer, 1999; Brown, 1984; Zube, 1987). Even if its limitations are recognized, this approach may be useful to sustainable development. Furthermore, attributing an economic value to environmental resources and services implies the willingness to pay for these environmental services and the preservation of the resource that supplies them (Elsasser, Meyerhoff, Montagné and Stenger, 2009; Turner, Paavola, Cooper, Farber, Jessamy and Georgiou, 2003). In terms of sustainability, the willingness to pay for such services can be considered an alternative or in certain cases a supplement (Engel, Pagiola and Wunder, 2008; Wunder, 2005) to environmental taxes, mechanisms based on the principle of command and control, integrated conservation and development projects (Engel et al, 2008; World Bank, 2003). Under certain conditions, the willingness to pay could result in a financial incentive to local actors to transform the value of natural resources into goods and services (Muradian, Corbera Pascual, Kosoy and May, 2010; Turner et al., 2003). When the willingness to pay is formalised and results in a PES, a means is provided to introduce environmental services to a market in which such services are normally not available. However, the value of these services is not well defined because of the origin of the services in a resource often considered at least partially as a public good.

What characterizes a PES is the presence of certain elements (Wunder, 2005), such as a voluntary transaction, a well-defined environmental service or a land use that ensures the availability of that service, the availability of at least one buyer and one provider within the market and a certain degree of reliability in the provision of the service. However, the appearance of all these elements is not a rule within a PES. In most cases, only certain elements appear, which creates a mechanism that resembles a PES (named PES-like) but that is not entirely consistent with the theoretical model mentioned above (Van Noordwijk and Leimona, 2010; Wunder et al., 2008).

The most frequent deviations from the basic PES model are related to the type of incentive proposed, the degree of voluntariness of the transaction implemented, the allocation of property rights and sales, the degree of negotiation and the presence of a clear link between the service provided and the actual work setting (Wunder, 2005).

According to Wunder (2005), the key attributes that allow a PES to be identified are that the mechanism is realistic, voluntary and conditional. The ability of a PES to reflect these attributes varies according to different situations and conditions[3] with respect to a worse starting situation[4].

[3] A voluntary negotiation should involve both parties (providers and beneficiaries/buyers) and assume a common set of information and free choices for all the individuals involved. The conditionality of a transaction refers to the benefits received from the suppliers of environmental services and shared by all stakeholders involved in the transaction.

[4] According to Van Noordwijk (Van Noordwijk and Leimona, 2010), this group of attributes can be included within the attribute '"effectiveness". In this case, the effectiveness consists of minimizing the inputs involved in the transaction. Fairness is another important attribute that is related to the distribution of services and their compensation. These attributes suggest a criterion by which the PES can be defined.

3. LANDSCAPE USE AND RECREATION ACTIVITIES IN FOREST

Recently, the forest is considered more than a timber supplier. In addition, the forest can supply social needs and present a new manner of resource use (Reimoser, 2005). The natural landscape is difficult to define as a commodity. One definition of the rural landscape is that of a permanent creative process in which forests play a fundamental role. This permanent process includes both an intrinsic dynamic, which allows the landscape to change, and factors that allow the process's development and evaluation (Gios and Clauser, 2009).

The transformation of goods and services associated with the use of the natural landscape and recreational activities into marketable products and services is not straightforward, particularly with forest resources. As noted by several authors (Wunder et al., 2008; Pettenella and Secco, 2006; Wunder, 2005; Merlo et al., 2000), different methods and channels exist to transform services, products and externalities of traditional forest management into innovative and profitable products and services.

From a user's perspective, value of the natural landscape is the sum of three components: the scenic value, the recreational value and the evocative value (Dillman and Bergstrom, 1991). A first distinction for these three components is characterized by use value which is derived from the direct use of the resources. Among these three components, the evocative component does not possess a use value, while the two scenic and recreational components can be explained according to use value.

The scenic component, which combines several aesthetic qualities, is composed of other values.

The landscape must be regarded as a set of goods rather than as a single product. In particular, within a different framework in which landscape is related to a forest, a set of at least three different viewpoints could exist. As noted by Clawson, Held and Stobbard (1960), depending on the prevailing recreational or scenic value, the forest landscape can be understood as follows:

1. as completely or partially user-oriented;
2. as a "container" for resources that facilitates the recreational use of the resources;
3. or as a background.

In the framework of landscape fruition, these different understandings of the landscape will result in different levels of excludability from the landscape fruition.

These different degrees of excludability limit the creation of an effective market for the landscape commodity. To define a clear link between a product introduced in the market and the payment requested for the product (the effectiveness attribute), in addition to defining the producers and the beneficiaries, is complicated. It should not be underestimated that the landscape value of the various components depends not only on objective but also on cultural aspects through which the landscape is interpreted (Goio and Gios, 2011).

Thus, all attempts to apply a PES to a forest landscape should first identify the specific characteristics of the landscape.

Generally, the transformation of environmental goods and services into marketable products involves institutional and special intervention at different levels and promotion management (Merlo et. al., 2000). In addition, this transformation implies the redistribution of the roles and benefits as well as the recruitment and training of human capital. The transformation's critical points are the efficiency, effectiveness, fairness and cost of benefits sharing[5] and the control over the cost of identifying and managing free riders.

[5] See Gatto, Pettenella and Secco, 2009, Engel et al., 2008, Wunder et al., 2008.

Therefore, to the abovementioned key attributes identified by Wunder (2005) must be added other requirements, such as efficiency[6], effectiveness[7] and equity distribution[8]. These attributes play a dominant role when attention is shifted from the theoretical background to the consequences related to PES implementation (Van Noordwijk and Leimona, 2010; Gatto et al., 2009).

4. DESCRIPTION OF NWFP&SS

From consumer's perspective, NWFP&Ss can be grouped into three categories: mass[9], specialized[10] and complementary[11] products and services (Niskanen, Slee, Ollonqvist, Pettenellla, Bouriaud and Rametsteiner, 2007).

The analysis of these inputs according to marketing-mix theory (4 Ps) shows that for mass products and services, product, price and cost minimization represent crucial elements. Generally, the promotional component is supported by brand creation, in certain cases ascribable to historical or territorial components[12]. The success of this group of NWFP&Ss can be attributed to factors such as the human and social capital involved[13], weather conditions, the seasonality of products and services, and product perishability.

Non-Wood Forest Products and Services are defined as specialized products and services when certain conditions are met. These specialized products and services have high added value. However, their availability is limited by quantity and environmental or seasonal conditions. Their target market consists of small number of buyers. Even in this case, within the marketing mix, the product is highly important, particularly because of the product's direct association with quality. However, the products are subject to a high risk of imitation. Therefore, promotional activities remain an important vehicle of differentiation. These activities include the use of environmental and certified labels and alternative merchandising channels, such as web retail.

The main feature of complementary products is the combination of relationships and territorial linkages, which provide complementary products and services with features and values capable of differentiating them from similar products on the market in other areas. Precisely because of the territorial linkages, networking and cooperation among local institutions and the business sector is difficult, which

[6] Efficiency refers to the relationship between costs and revenues eventually deriving from the PES, the return of the initial investments and the return of the costs incurred for implementation and maintenance.

[7] The effectiveness implies a clear link between the cause and the effect of the PES or an acknowledgement that a service or environmental good exists for which the supplier is allowed to claim remuneration.

[8] The equity in the distribution is frequently investigated within the PES and in the management of environmental P&S, particularly with respect to developing countries and the benefits and empowerment of indigenous peoples. Equity is discussed in relation to the effective rewards produced by the PES as source of income to reduce poverty where complex circumstances exist in property-rights allocation and land-use planning. In Europe, where the management of environmental resources has already undergone several changes, equity in distribution is often a matter of clearly identifying the suppliers of a commodity or service and the beneficiaries. In many cases, the individuals in charge of natural-resource management are not the same individuals in charge of marketing the products or services. In most cases, the main difficulty is related to benefits distribution and determining the price of the goods. The price of the goods or environmental service is an important factor in determining the efficiency of PES implementation and the mechanism's ability to garner approval by potential users and return a fair reward to those who are providing the service.

[9] The products and services are offered on the mass market as undifferentiated and are aimed at a wide range of potential buyers. Examples of mass products are mushrooms, berries, chestnuts, cork, foliage (recreational activities related to observing the flora and fauna and the changing colors within the forest in different seasons) and Christmas trees, while examples of mass services are recreation activities, nature conservation and water-resource protection.

[10] Specialized NWFP&S include natural Christmas trees, medicinal forest products and truffles, while specialized P&S include birding, animal watching, skiing and cultural and environmental education. These products and services possess high added value but are available in limited quantities or under special or seasonal environmental conditions. The target market consists of small user groups.

[11] Complementary NWFP&S include all activities associated with the products mentioned above. However, complementary NWFP&S are characterized by a strong tourism component. Therefore, to strictly environmental resources, complementary NWFP&S add the support of the local tourism organizations. Examples of this complementary linkage include the tourism related to mushroom hunting in the forests near Borgotaro in the province of Parma, rural tourism connected to wine and chestnuts (e.g., the Chestnut Trail in the Isarco Valley, Alto Adige), ecotourism, adventure parks, leisure facilities, trekking and mountain biking, among others.

[12] Brand promotion involves advertising and positioning products and services in a selected market.

[13] In rural areas, the recruitment and training of individuals to perform this highly skilled job are problematic (Pettenella and Maso, 2009).

results in the creation of complex product systems. The products can include more than the plain fruition activities, providing a more numerous set of services, such as accommodation, food and wine, local customs and traditions. The complementary NWFP&Ss play a strategic role in the promotion of local rural development strategies that invigorate local business and the networks closely related to the local area (Pettenella and Maso, 2009). To the traditional 4Ps marketing mix, two other elements can be added, such as political power and political participation. Where this addition is possible, the complementary NWFP&Ss manifest unique features associated with participation, political support and strong interaction between the various public and private stakeholders (Pettenella and Secco, 2006).

5. PESs CASE STUDIES AND THE METHODOLOGICAL FRAMEWORK

Based on an extensive review of the literature, PESs related to landscape use and recreational activities can be grouped according to landscape, scenic beauty and recreation[14], adventure parks[15], mountain chalets[16], theme trails and cultural and recreational activities related to the timber industry[17], niche products and services associated with forest use[18].

[14] Note that the forest landscape can be understood as completely or partially user-oriented, as a "container" for resources that facilitates the use of the resources for recreation, or with a background function.

[15] Generally, adventure parks and acrobatic tours are built in wooded areas that facilitate direct contact with nature and the use of tree trunks for the construction of the various paths. The structures consist of elevated walkways, Tyrolean traverses, bridges and other objects made from wood, rope and steel cables. The park fruition is normally preceded by on-site training by qualified instructors. The visitors are then provided with protective equipment, which consists of a helmet, lanyards, harnesses, carabiners and pulleys, all manufactured according to specific safety standards. Adventure parks are widespread in Europe and around the world.

[16] Mountain chalets are not a proper forest service or product. However, the chalets represent an important value within the local natural and social heritage. In Europe and elsewhere, chalet fruition and use is often instigated by private companies that refurbish the buildings to serve tourists who want to experience forest life.

[17] The activities associated with the use of wood in a manner linked to local culture and tradition can be pursued at woodworking workshops in the mountains. These activities are part of an attempt to combine tourism with local handcrafting. In this way, local handicrafts and cultural heritage can be revitalized, and a connection can be established between traditional local business activities and tourism. In addition, the activities enable tourists to participate in woodworking to learn about local culture.

[18] Services and niche products associated with the use of forests are numerous, for example, yoga and meditation. In this connection, Manning and colleagues (1999) discuss an anthropocentric view that places man at the evaluating center of natural resources, a bio-centric view that focuses on the environment and biological elements and an eco-centric vision that considers the resources as part of a systemic approach to services and goods derived from natural resources. The natural and spiritual qualities of the forest seem hospitable to the practice of relaxation and breathing exercises. The value of these qualities is reflected through the demand for niche products related to yoga and meditation. Another activity is the observation of forest flora and fauna. Among the first group of activities, foliage viewing is the most representative. Foliage viewing consists of the observation of tree leaves that change color in the different seasons. The season that is most popular for this form of tourism is the autumn. This phenomenon is widespread in the United States and in Italy. Furthermore, observing wildlife is popular, particularly deer, grouse and numerous other species typical of forests. Forestry education is also popular. Forestry education consists of activities, lessons and simulations related to biotic communities in and around the forest (as proposed by the city of Trevisio). In addition, educational and recreational activities using donkeys (Eselabenteuer) are popular (source: Weisinger, 2009).

Table 1. Landscape.

Product/Service	Location	Marketable Product/Service	Who buys	Who sells	Who benefits	Source
Landscape and scenic beauty.	Costa Rica	Landscape management and enhancement of scenic beauty and landscape.	Fonafifo (National Autonomous Authority)	Local community and landowners.	Tourism companies.	Pagiola, 2008
Landscape and scenic beauty. Recreational activities.	UK	Improvement and enhancement of recreational activities related to natural resources.	The UK government and the EU (through European funds and national financial support).	Farmers from selected areas.	Natural-resource (mostly water resources) users and recreational participants.	Dobbs and Pretty, 2007
Recreational activities: safari.	Zimbabwe (Campfire)	Biodiversity conservation and enhancement of access to resources.	Tourism operators and NGO donors .	Local communities through the direction of the local rural council.	The entire community.	Frost and Bond, 2008

Source: own elaboration.

Table 2. Adventure parks.

Product/Service	Location	Marketable Product/Service	Who buys	Who sells	Who benefits	Source
Go Ape.	UK	Adventure parks	Private agents	Private agents/manager		http://goape.co.uk/
Tree Top Adventure.	UK (Galles)	Parco avventura nel Galles	Private agents	Private agents/manager		http://www.ttadventure.co.uk/
Jungle Raider Park.	Italy (Como and Lecco provinces)	Two adventure parks	Private agents	Private agents/manager		http://www.jungleraiderpark.com/it/home.xhtml
Parco Avventura Sella Nevea.	Italy (Carnia area)	Adventure Park	Private agents	Private agents/manager		http://www.sellaneveapar co.it/ e Wiesinger, 2009.

Source: own elaboration.

Table 3. Mountain Chalets.

Product/Service	Location	Marketable Product/Service	Who buys	Who sells	Who benefits	Source
Almdorf, Seinerzeit.	Austria, (Carinthia)	Tourist accommodation for tourists and recreation.	Private users/visitors	Private managers		http://www.almdorf.com/Benvenuti.html
Montagne-Alternative.	Switzerland	Tourist accommodation for tourists and recreation.	Private users/visitors	Private managers		http://www.montagne-alternative.com/
La taïga.	Switzerland	Tourist accommodation for tourists and recreation.	Private users/visitors	Private managers		http://www.megeve-reservation.com/location-megeve
Le Chalet Tournesol.	France	Tourist accommodation	Private users/visitors	Private managers		http://lechalet.biz/

		for tourists and recreation.				
Hidden Valley Cabins.	Australia	Tourist accommodation for tourists and recreation.	Private users/visitors	Private managers		http://www.hiddenvalleycabins.com.au/bookings.htm
Destinazione Baiersbronn.	Baiersbronn, Germany	Tourist accommodation and hospitality for tourists and recreation	Local and foreign visitors	Private managers and various stakeholders		http://www.baiersbronn.de/text/240/en/hiking-huts-und-inns.html
Baumkronenweg/Baumhotel.	Austria	Tourist accommodation and other facilities and activities for tourists and recreation.	Private users/visitors	Private managers		http://www.baumkronenweg.at/bkw/ e Wiesinger, 2009.
La suite della quercia.	Italy	Tourist accommodation for tourists and recreation.	Private users/visitors	Private managers		Wiesinger, 2009.

Source: own elaboration.

Table 4. Specialty wood and Distribution.

Product/Service	Location	Marketable Product/Service	Who buys	Who sells	Who benefits	Source
Resonant spruce wood (a).	Italy, Trentino, (Paneveggio province-owned forests)	Resonant spruce wood	Lutists and private producers of sound boxes for musical instruments	Manager of the local province-owned forests (APROFOD)	Silvicultural forest manager APROFOD and other vendors of local wood, producers of musical instruments, tourists and final users; benefits for the destination as tourist brand	Zugliani and Dotta, 2009 in Sherwood 155, 14-22
Resonant spruce wood (b).	Italy, Trentino, (Collective ownership "Magnifica comunità di Fiemme", the violin forest)	Resonant spruce wood	Lutists and private producers of sound boxes for musical instruments	Manager of the collectively owned "Magnifica comunità di Fiemme"	Collective ownership of "Magnifica comunità di Fiemme", producers of musical instruments, tourists and final users; benefits for the destination as tourist brand	http://www.parcopan.org/it/territorio/ambienti/la-foresta-di-abete-rosso-p92.html
Wood.	Italy, Trentino, (Fiemme Valley)	Woodworking workshop and local mountain and forest handicrafts	All, mainly visitors and tourists	Organized by the local Tourist Board and local artisans	Tourists, visitors, local Tourist Board and local mountain and forest handicrafts.	http://www.visitfiemme.it/benvenuti/artigianato-di-montagna
Arte Sella.	Italy, Trentino	Open-air museum located in a forest	Visitors and users of the museum	Museum manager	Mainly tourists and visitors	http://www.rivistasherwood.it/sherwood.html; http://www.artesella.it

Sound trails.	Natural Park of Our (Hoscheid, in France, Belgium, and Luxemburg)	Belonging to the Wood routes project	Visitors and users of the Natural Park of Our	Natural Park of Our	Mainly tourist and visitors	http://www.lesroutesdubois.com/fr/, http://www.klanglandschaften.lu/en/trail.htm
Holzpark.	Austria	Area equipped with woodworking facilities within a forest			Mainly tourists and visitors	http://www.schnitza.at/de/index.asp
Chestnut distribution chain.	Alto Adige, Italy	Chestnut trails	Visitors and users		Tourism agents and enogastronomic operators.	www.valleisarco.info
Chestnut sponsorship.	Lucca Province, Italy (Garfagna)	Chestnut sponsorship	Private users	Association of chestnut producers		http://www.associazionecastanicoltori.it/php/index.php?option=com_content&view=article&id=23&Itemid=16 e Weisinger, 2009.

Source: own elaboration.

Table 5. Sporting activities[a].

Product/Service	Location	Marketable Product/Service	Who buys	Who sells	Who benefits	Source
Bruno's Bogenparcours.	Austria	Archery with 3D targets	Visitors and users		Mainly visitors and tourists and local businesses.	http://www.schladming-dachstein.at/en/region/schladming-rohrmoos/summer/sport_aktiv/bogenparcour.htm e Weisinger, 2009.
Wildpark Buchenberg.	Austria	Olympic game of forest activities (archery, crossbow, activities related to woodcutting)	Visitors and users		Mainly visitors, tourists and local businesses.	http://www.tierpark.at/ e Weisinger, 2009.

Source: own elaboration.

[a]A set of recreational and productive activities related to niche products and services for forest fruition. The activities include foliage, flora and fauna observation, meditation and yoga, forest pedagogy, beekeeping and honey production.

6. SUCCESSFUL ELEMENTS OF CASE STUDIES ANALYSED

According to the literature analyzed, a first successful element is taken if and when an environmental resource is to be recognized as a product or service. In this case, the environmental resource is clearly identified as a product or service. A certain price should be paid to access the product or service. This step may not be taken for granted, and if the process is straightforward in certain cases, in others, establishing a connection between a product or service and environment resources is not easy. There are several reasons for these difficulties. In certain cases, one of the most common problems is the complexity of identifying the environmental resource as a commercial product or service. Environmental resources are normally considered public and not immediately identified as products or services that require a fee. Therefore, clearly identifying the functions and features of the managing authority and the environmental resource is essential. The environmental resource must be identified and the resource's availability and affordability as a service or product must be communicated to users.

The next key step must be taken if this environmental product or service is to be recognized as worth paying for and therefore be rewarded through a PES mechanism. That is a second successful element points out. To guarantee effective results, the relationship between the product or service and the price must be clear. Accepting the necessity of payment implies accepting the value of the resource, and in this manner, the cost of use will return to the providers.

In the studies considered, many goods are recognized as services or products when the creation of added value is clear. Although in the literature, such as in the UK case study, the forest landscape is considered an environmental resource that can generate fees, the value of the forest landscape is properly acknowledged when the forest landscape is linked to other values that complete it and add value. Thus, a fee can usually be demanded for using the environmental resources.

With landscape, the cultural component, tradition and the human capital that has changed and modeled the landscape are usually the elements from which a PES mechanism can be devised.

In the case studies, in addition to the landscape, this last element pertains more directly to the theme trails and mushrooms and truffles.

A third essential element is the identification of the environmental product or service with the entire destination. This identification is more straightforward because the product in question has a widely recognized value. In the cases analyzed, exclusivity and typical local features are the recognized value. In many cases, the success of the products lies precisely in an embedded policy of differentiation in terms of product quality and uniqueness. The product is defined as unique, exclusive and high quality because of the strong territorial connotation[19]. The element of forestry and land management as a whole is fully included as an essential condition for the production of that product or service[20].

A fourth key to success is represented by the creation of a network and local synergies where the entire destination supports the PES. The destination refers to the entire system that combines local stakeholders interacting with the PES at different levels and the additional value of the resource in question. In many cases, the correlation between the product or service and the skills within the area is not immediate

[19] Another example of a strong linkage between a product and an area is apparent in the case of the chestnut trail in South Tyrol, where the environmental component is fully connected to the local context, including the culture, traditions, food and wine and local crafts. The same can be said for the theme trails, while in other case studies, the territorial connotation becomes less important .

[20] The recreational uses of trails are numerous. The Chestnut Trail in South Tyrol is connected to the local culture, traditions, food and wine activities and local crafts. The same can be said for the theme trails, while the territorial connotation becomes less important in the other case studies. The Arte Sella is an outdoor museum in Val di Sella near Borgo Valsugana. The museum includes an exhibition space in Malga Costa, the Vegetable Cathedral and an "ArteNatura" path. The 5-hour tour requires an admission ticket. The "ArteNatura" path is a permanent exhibition of art works made from natural materials and located within the forest. Similar experiences can be had in central Europe, such as the "sound paths" in a forest in the Our Natural Park. In addition, a great number of sporting activities occur inside the forest with matches organized for private and professional players.

and regular. Generally, local companies begin to network to create an effective and integrated system only after the implementation of the PES. In certain cases, local companies require the support of external authorities or public agencies to ensure that this integration occurs (i.e., business consortiums and tourist offices).

This public support often takes the form of certifications or similar mechanisms of broader effect (i.e., product-typicity labels or indications of geographical origin) to ensure a more effective return for the destination image. The network and the creation of synergies mentioned earlier are highly important with respect to the support of public authorities. This support is expressed through the value of the connections and the accessibility to funding. In the successful cases, institutions and management authorities are the stakeholders who took charge of the legal formal and informal bureaucracy involved in implementing a new PES. In addition to the efforts of these stakeholders, local associations and organizations interact at different level to create a solid foundation for mutual cooperation and consultation.

A fifth element highly important for the final result is clear property rights. Where the PES has been successful, the general framework consists of stakeholders who have explicit rights to the property in question. In certain cases, the allocation of property rights is complex. With a natural landscape, not the formal allocation of property rights but the acknowledgment of certain services provided by farmers is important. The value of those services is recognized, and the farmers are rewarded for the services they provide to society.

Where a PES has been successful, a sixth key element has been the introduction of limits on the resource use. The limits have been directly linked to a new perception of a valuable service for the community and the service users. To support this view, practical examples can be given of restrictions that lead to an added value service or product. One example is charging a fee for a permit to gather fungi rather than implementing paid parking zones to prevent congestion. These limits may be factors of success because the limits are recognized as a guarantee of higher value and higher quality for the product or service fruition.

A seventh element exists. In certain cases, the implementation of the PES has motivated the introduction of new skills and the re-introduction of old skills to the local population and the wider involvement of local expertise, some of which is already being applied in other business sectors[21]. Mountain chalets and adventure parks require new skills. In the other case studies, skills and activities already present in the area (such as local crafts, food, wine and accommodations) have been recovered, and a complementary use of the same skills has occurred to create products and services integrated in an overall fruition.

This integration of different skills and local business activities reveals how important the factors of local culture and tradition enhancement are to the successful implementation of the PES, in addition to the strong involvement of area residents.

Other factors related to economic and financial areas of impact were identified as successful elements. Among them is the relation between input and output. This relation is the proportion of the employed resources to the economic, financial, social and idiosyncratic (identification and recognition successful elements) results. The proportion was defined as one of input to output, in particular in adventure parks and mountain chalets, where private investments are more consistent.

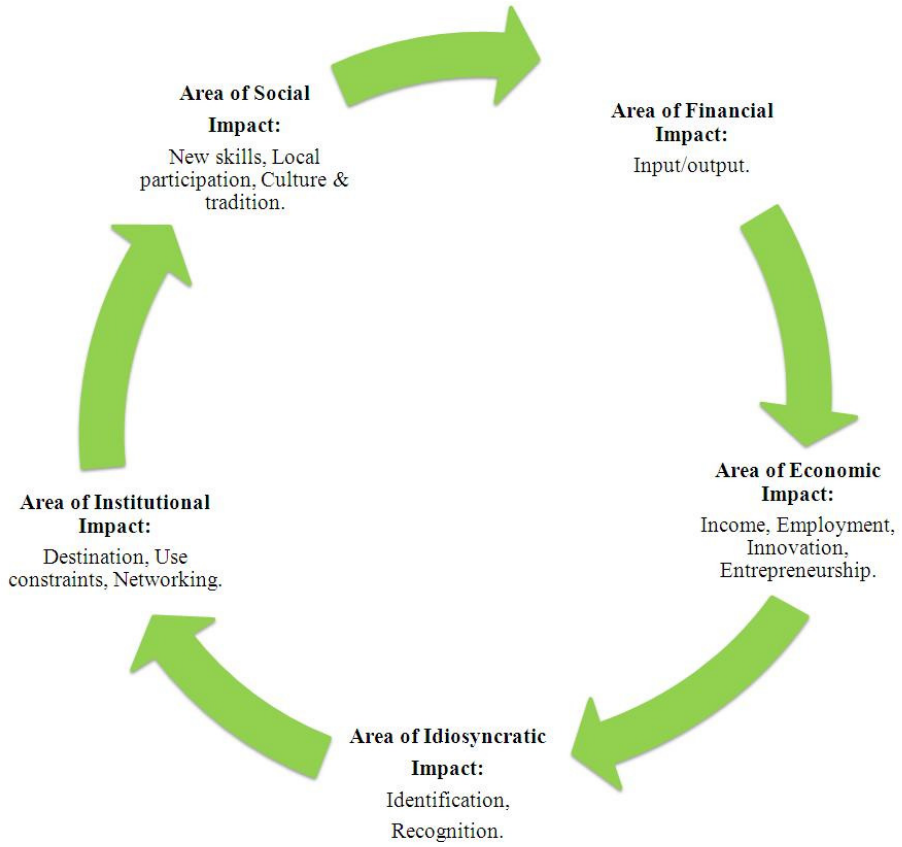
In addition, in all of the case studies analyzed, the creation of additional income and new jobs are important aspects. These benefits result mainly because the PESs analyzed are placed in rural areas, which are usually characterized by an underdeveloped economy.

[21] Mountain chalets and adventure parks require new skills. In the other case studies, a recovery of skills and activities in different economic fields, such as local crafts, food, wine and accommodations, has occurred in addition to the complementary use of those skills to create new products and services in an integrated system.

Finally, two other elements taken into account are the introduction of innovative factors and strong entrepreneurial drivers arising from or immediately following the introduction of the PES.

In the 28 cases studied, the various keys to success that have been identified have been grouped in five areas of impact: economic, financial, social, institutional and idiosyncratic. The relationships among the areas are defined in Figure 1.

Figure 1: Relationship among areas of impact according which can be grouped the successful elements deriving from the case studies analysis.



Source: own elaboration.

The presence of the key elements appears necessary to ensure the duration of the success. More specifically, the input-output proportion belongs to the financial area of impact, while income, employment, innovation and entrepreneurship belong to the economic area of impact. Parts of the social area are the generation of new skills, local participation and the enhancement of local culture and traditions. Destination, use constraints and networking belong to the institutional area of impact, while the idiosyncratic area includes landscape identification and recognition.

Figures 2 and 3 show first in an aggregate frame and then in an individual form the analyzed success factors, which have been scored from 1 to 3 on the basis of the degree of presence and development in the case studies. For each case study, the presence of those success elements with a different degree in relation to one other is noted. The scores range from 1 to 3, where 1 implies a minimum degree of presence, 2 a medium degree, and 3 a maximum presence. The score is intended to indicate the degree of development and importance of the factor to the final PES implementation. The score is assigned as a value of the elements developed within a case study in comparison with the other case studies.

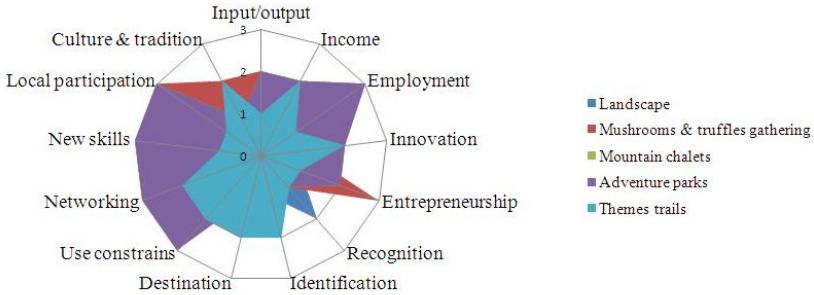
The radar charts give an overview of the results (Figure 2) and of the differences among the five subsets taken into account (Figure 3). The importance of the financial elements in mushroom and truffle gathering, mountain chalets and adventure parks can be observed. Radar charts are widely used to explain the dynamics among interconnected variables or factors (Lescuyer, 2012; Bragança, Mateus and Koukkari, 2010; Bychholz, Rametsteiner, Volk and Luzardis, 2009; AlWaer, Sibley and Lewis, 2008; Aiello and Donvito, 2006, among others). Generally, these charts facilitate a clear and direct interpretation.

For the innovation and entrepreneurship elements, theme trails and new uses of forest resources gained the higher scores.

The recognition of environmental resources in products and services has a score ranging from 1 to 2. This can be observed in the landscape and theme trails cases. In these cases, the forest resources have been integrated within a market system in a more effective and profitable manner than in other cases.

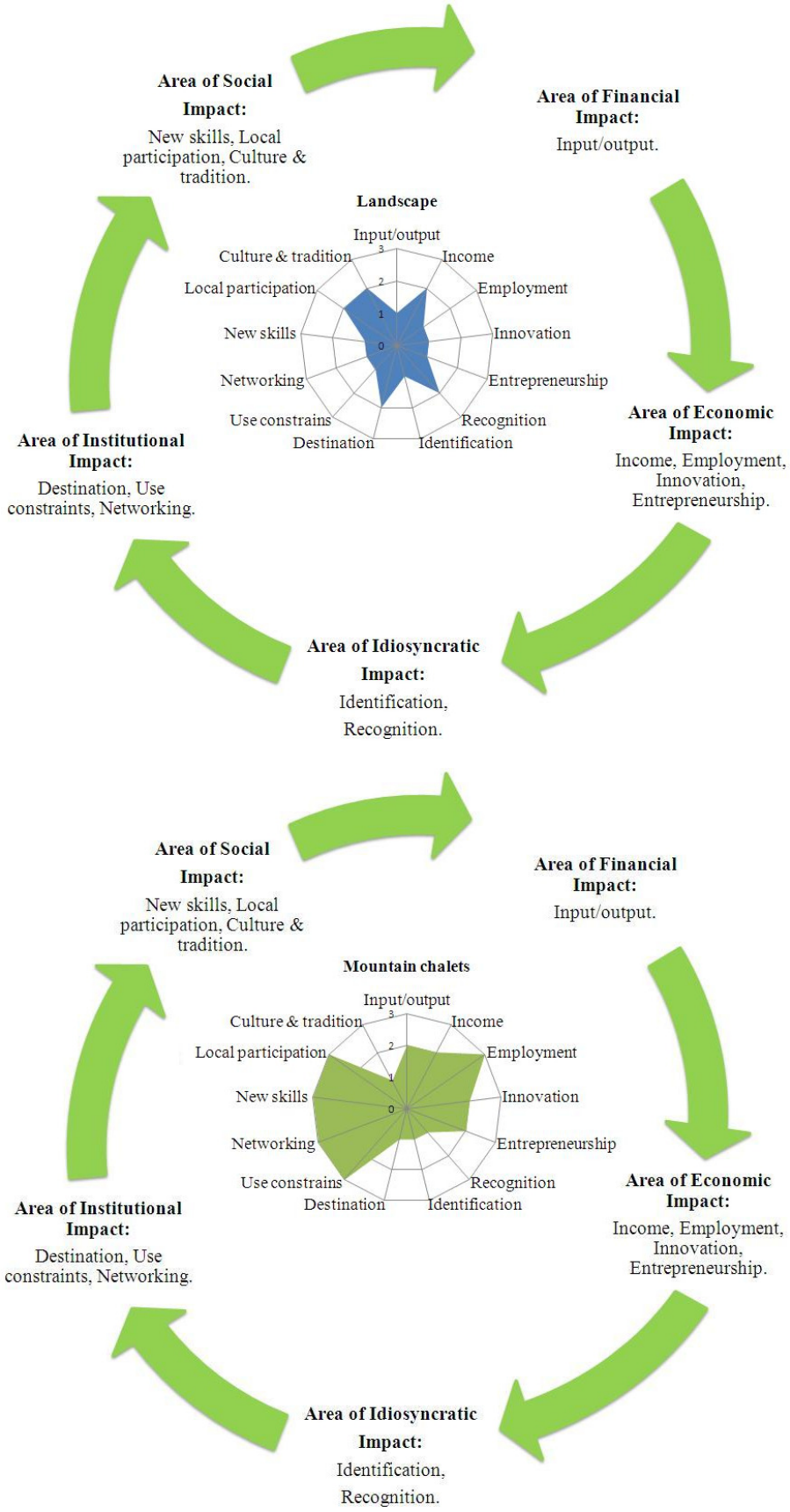
Within the institutional area of impact, the destination represents the element that is more often emphasized in the case studies related to the landscape and theme trails. The use of limits and constrains is much more evident in relation to mountain chalets and adventure parks, including the private nature of this type of activity and to the creation of network and synergies at the local level. In almost all case studies, skills and local participation are extremely important, as is fostering local culture and traditions.

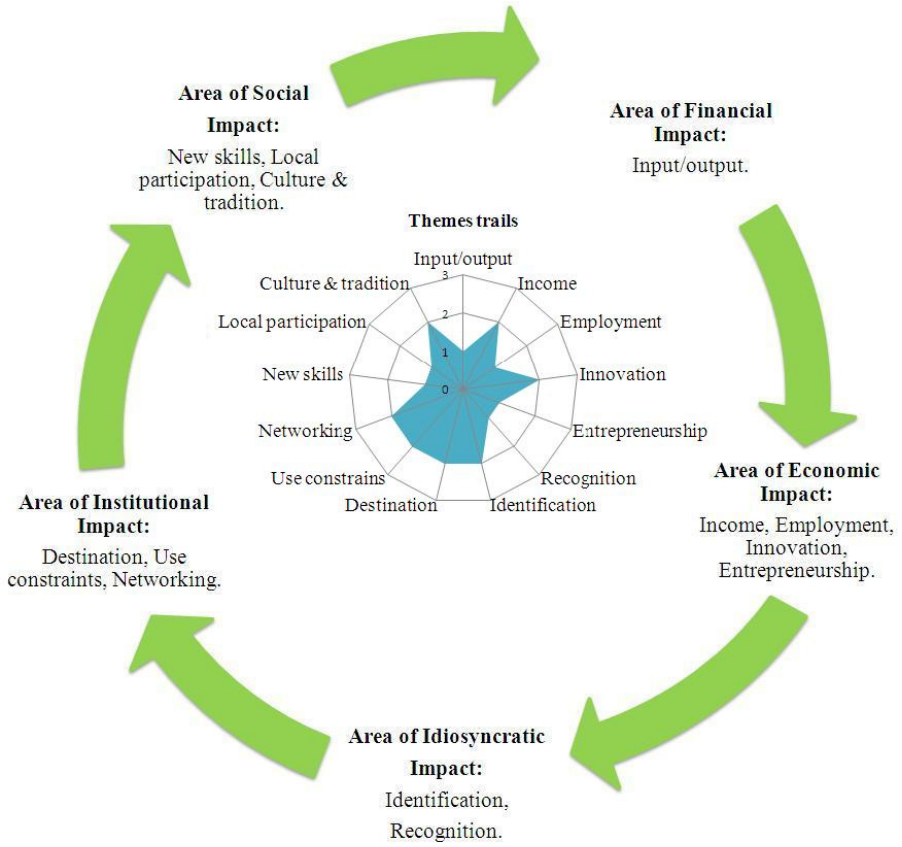
Figure 2: Successful elements according to the cases study analyzed**.**

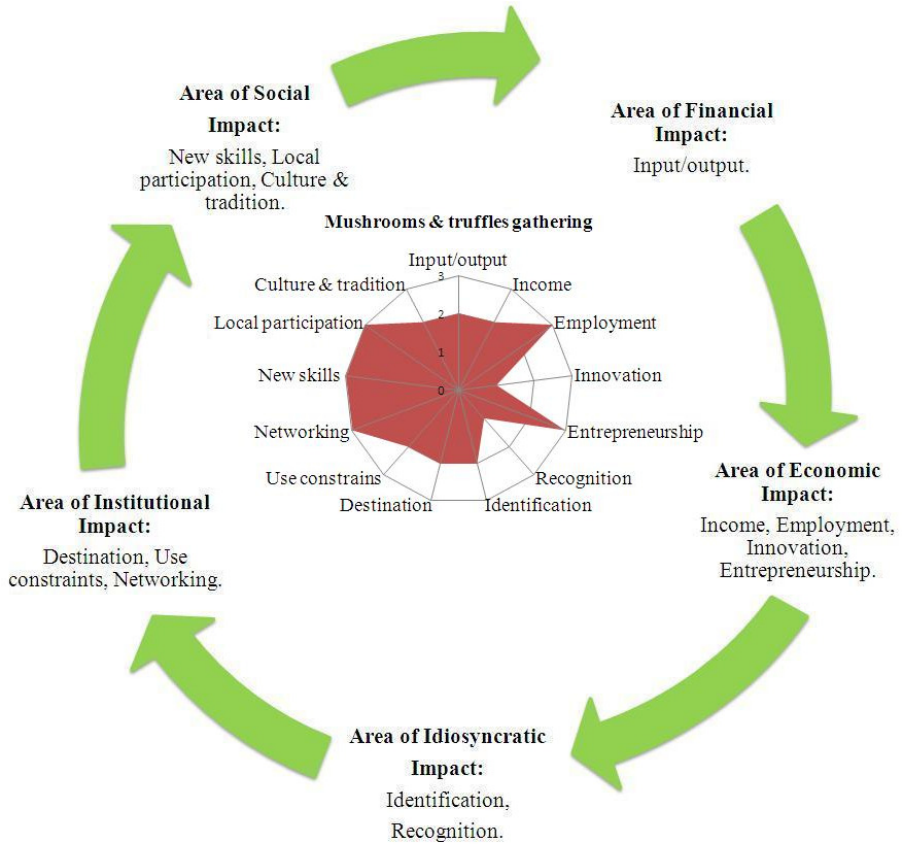


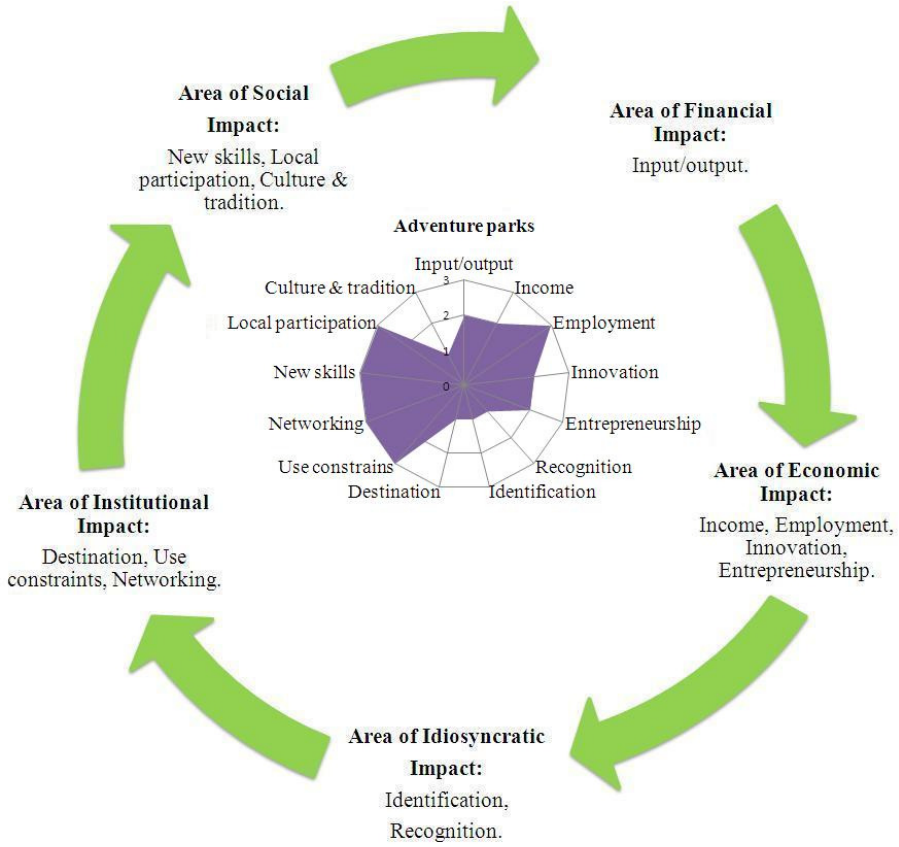
Source: own elaboration.

Figure 3: Successful elements according to the cases study analyzed distributed by impact areas.




Area of Social Impact:
New skills, Local participation, Culture & tradition.
Area of Financial Impact:
Input/output.
Themes trails
Input/output
Income
Employment
Innovation
Entrepreneurship
Recognition
Identification
Destination
Use constrains
Networking
New skills
Local participation
Culture & tradition
3
2
1
0
Area of Economic Impact:
Income, Employment, Innovation, Entrepreneurship.
Area of Institutional Impact:
Destination, Use constraints, Networking.
Area of Idiosyncratic Impact:
Identification, Recognition.


Area of Social Impact:
New skills, Local participation, Culture & tradition.
Area of Financial Impact:
Input/output.
Mushrooms & truffles gathering
Input/output
Income
Employment
Innovation
Entrepreneurship
Recognition
Identification
Destination
Use constrains
Networking
New skills
Local participation
Culture & tradition
3
2
1
0
Area of Economic Impact:
Income, Employment, Innovation, Entrepreneurship.
Area of Institutional Impact:
Destination, Use constraints, Networking.
Area of Idiosyncratic Impact:
Identification, Recognition.



Source: own elaboration.

7. CONCLUSIONS

The analysis of the case studies reveals that the creation of a successful PES depends on the ability to enhance several different features. Building a system that takes into account the specific local circumstances and the prospect of introducing effective and appropriate management models is crucial. In addition, involving local stakeholders from the public and private sectors and enlisting their support for the PES is important.

The limited spread of the PES can be explained not only by the objective difficulties that PES implementation requires. The paucity of standard models is also an impediment. In each case, specific solutions must be identified. These solutions are required to translate general principles and to ensure that the PES is appropriate and relevant to the context in which the PES is located. The dissemination and implementation of the PES will require testing and repeated attempts with different degrees of failure risk.

Moreover, the specific solutions require adaptation with each implementation depending on the variety of the products and services selected for the consumer market.

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