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The Socio-Economic Value of Protected Areas. The Bucegi Natural Park

Adriana GRIGORESCU[1], Madalina-Nicoleta FRINCULEASA[2], Razvan-Ion CHITESCU[3]

[1] National University of Political Studies and Public Administration, 30A Expoziției Blvd., 010324 Bucharest, RO; Correspondent Member of the Academy of Romanian Scientists 54 Spl. Independentei, 050085 Bucharest, RO; adriana.grigorescu@snspa.ro (corresponding author)

[2] Valahia University from Targoviste, 2 Carol I Blvd., 130024 Targoviste, Dambovita, RO; madalina_chitescu@yahoo.com

[3] National University of Political Studies and Public Administration, 30A Expoziției Blvd., 010324 Bucharest, RO; razvanric@yahoo.com

Abstract: Natural ecosystems are extremely exposed to the ever-increasing changes in population growth and the expanded need for resources. The economic capitalization of their constituent elements makes their degradation and conversion more profitable than conserving them. Nevertheless, mankind is mindful of nature's value, and over time has developed its policy and means of protection and conservation to help it integrate its actions so that they respect the paradigm of sustainable development. Most of the ecosystem's functions are, also, economic. The process of determining the economic value of an ecosystem is a laborious approach that involves specific instruments that depend on many variables. These variables are induced by the innate/ natural transformations of the biogeographical environment or by particular situations generated by extreme phenomena. This study addresses the economic value of natural areas (with the example of the Bucegi Natural Park –B.N.P.) in a methodological context focused on international studies, with results in certain protected areas in Romania. The established report managed to provide an economic value obtained both from the revenues generated from the costs for visitors and jobs and through the capitalization of the non-commercial benefits. As an important element in our investigation, we took into consideration the pressures and menaces identified in protected areas. Natural activities (geological and geomorphological events, climate changes) and anthropogenic events (e.g. development of residential and commercial spaces, transport corridors and services, tourism activities) associated with negative elements (pollution, hunting and overfishing, degradation) involve costs. Dedicated by ever-changing legislation, inadequate financial support, and a faulty management approach, they tend to balance the scale against the benefits. The economic valorization of the components defining a protected natural area serves as an advantage for all involved parts. This must be performed within the limits of the actual legal framework but in the spirit of protection and respect for nature in all its' forms.

Keywords: ecosystem; protected natural areas; economic value; socio-ecological system; Bucegi Natural Park.

Introduction

An accelerated transformation is taken place in contemporary society. The processes are resource-intensive. Natural capital provides the resources and services underpinning these socio-economic development processes. Under these circumstances, the productive and support capacities of natural capital can be overcome, generating discrepancies and differences both spatially and temporally, but with a reflection on the well-being of people. As main components of the natural capital we can count the natural and semi-natural ecosystems. Protected areas are exposed to ecosystems, being the guarantor of their assessment, protection, and monitoring. A tendency for irreversible degradation of natural capital through intensive exploitation of natural ecological systems that negatively affect biodiversity exists worldwide. Hence, the development of biodiversity conservation

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strategies has become a priority. At the EU level, environmental policies on biodiversity have been transposed into the *EU 2020 Biodiversity Strategy* (European Commission, 2011), which, starting with 2011, aims to halt its loss and ecosystem services. The two concerned elements must be *properly protected, harnessed and restored, given the intrinsic value of biodiversity and the essential contribution of ecosystem services to human well-being and economic prosperity* (World Business Council for Sustainable Development, 2010).

The perspectives offered by the natural elements' socio-economic approach that compose different ecosystems lead to the multiple definitions of the *ecosystem services* concept. Over time it has been debated in studies as Daily (1997), Daily et al. (2009), de Groot, Wilson, and Boumans (2002), de Groot, Kumar, van der Ploeg, and Sukhdev (2010), Fisher et al. (2008), Gomez-Baggethun, Mingorria, Reyes-Garcia, Valvet, and Montes (2010), Kumar (2010), Laurans, Rankovic, Billé, Pirard, and Mermet (2013), Wallace (2007). There are connections between the permanent change of the market and its' positive and negative incentives concerning services provided by the ecosystem, but most of them have a core point the interdependence between services, subject, and benefits. Among these, we mention:

- *Ecosystem services are flows of materials, energy, and information from natural capital stocks that combine with manufactured and human capital services to produce human welfare* (Costanza et al., 1997, p.254).
- *Ecosystem services are components of nature, directly enjoyed, consumed, or used to yield human well-being (*Boyd & Banzhaf, 2007)
- *The ecosystem services are the benefits people get from interacting with nature* (Huntsinger & Oviedo 2014; MEA, 2005).

The Common International Classification of Ecosystem Services (CICES, 2013) suggests the following typology for ecosystem services:

1. *Supply services* are based on tangible products supplied by the ecosystem.
2. *Regulatory/Regulatory Services* refer to the natural processes of regulating an ecosystem, such as carbon sequestration and water redistribution, wind protection, stabilization of landslides. They contribute to people's safety.
3. *Cultural services* are the non-material benefits of ecosystem exploitation, meaning activities specific to tourism, creative and educational activities that emphasize the aesthetic, cultural and spiritual value of the landscape.
4. *Support services* needed to achieve all other benefits-generating ecosystem services. Their impact on social actors is indirect.

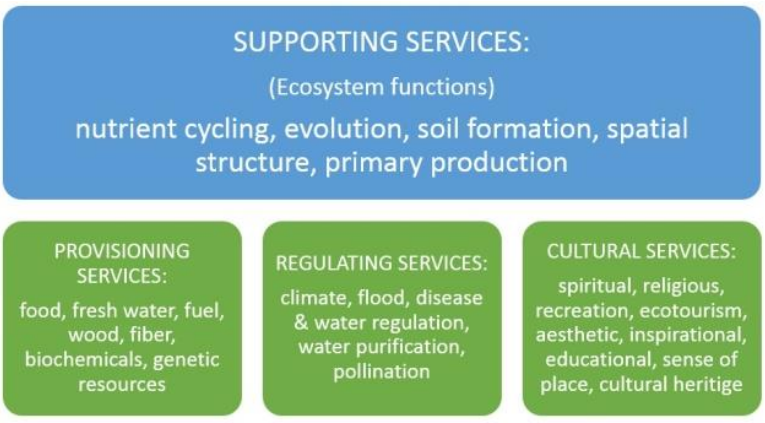

Figure 1. Classification of Ecosystem Services Cf. 2005
(*Classification of Ecosystem Services, 2005****)***

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Diaz et al. (2018) address the ecosystem's services, classifying them in material, non-material and regulating. The material contribution is given by the food (ex. forest fruits, mushrooms, animals, etc.) that could be obtained, row materials (ex. wood for construction, heating, furniture, etc.), and for decoration or art (ex. flowers). They are mainly represented by the physical elements that could be obtained.

The non-material contribution is given by intangible components that are contributing and affect the people's psychological wellbeing, like landscape, bids song, ozone, relaxation, and inspiration. The regulating effect is given by the soil protection, water regulation, climate protection, air purification, etc.

This typology emphasizes the various connections established between ecosystem services for its optimal operation and highlights the importance of biodiversity. Under the relatively stable conditions of a protected site, the use of environmental services can generate asymmetries when the balance between the types of systems providing assistance, regulation and cultural services, on the one hand, and those providing production services has induced fluctuations generally, external factors. Among the identified determined factors: population growth, technology development, increased economic activity, socio-political factors, religion, and culture.

The interdependence between the environment and society is complex, and the changes in their relationship are difficult to perceive. The holistic view of the social and the ecological/ natural environment as a unique system, but with effects and reactions from one subsystem to another, implies first of all the definition of the concept of the social-ecological system, and then, by derivation, the way of approach, evaluation, and recovery. The *concept of the social-ecological system* is a generous one because it integrates within a relatively unitary framework, knowledge in a wide field of disciplines and extremely dynamic because it aims to approach the links between environmental and social changes. It was defined as an *"integrated complex system that includes social (human) and ecological (nature) subsystems in a two-way feedback relationship"* (Berkes, 2011, p.11). Beyond its defining elements, it allows methodological pluralism in approaching the component systems and developing an interface between the scientific part and the decision-makers in the field of evaluation and practices of ecosystem services, thus leading to the establishment of the major political frameworks that take into consideration the social-ecological interactions.

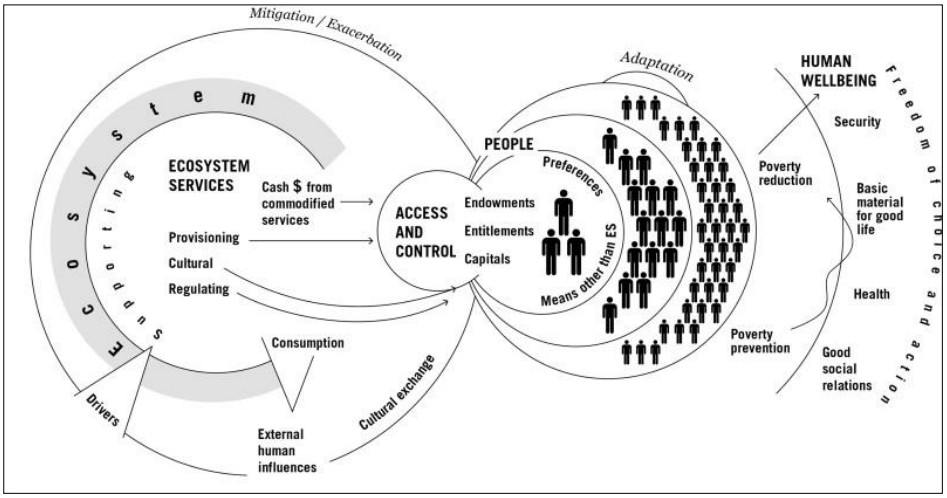

Figure 2. Conceptual framework.
Relationships between ecosystem services and poverty alleviation
(Fisher et al., 2014, p.36)

The benefits of identifying and sustainable exploitation of natural resources through ecosystem services for the community underline the social valence of these services. To evaluate them, they must be relevant to different social actors. It is the social actors who recognize or not the existence of a certain type of service, and they also give value to this service. These may vary in time and space depending on the way of recognition and the importance each community assigns to it. We take into account regional, national or scientific communities. The multitude of actors, through the institutions they represent, can provide opportunities and economic constraints, and, most importantly, they can shape or influence communities' perceptions of an approach that affects all three dimensions of environmental well-being and success (Mahajan & Daw, 2016) or conversely, which enhances the concerned socio-ecological components.

Economically, the ecosystem services represent all the advantages and benefits that arise from the existence of a natural area. Income and assets are the dominant indicators used to assess the social impact of protected areas (de Lange, Woodhouse, & Milner-Gulland, 2016). To maintain these benefits, some costs are involved: management costs (equipment, infrastructure, human resources, etc.), opportunity costs-the value of the uses to be dropped due to its protection and indirect costs (the impact of tourism, mineral exploitation). On the same note, international conservation policies and the interventions of some organizations sometimes go beyond the power of communities to cope with the social costs of conservation, so that in these situations, strategies for human well-being are inefficient, even leading to substantial costs. ... 'nature's benefits to people' should be 'nature's contributions to people' to recognize the existence of 'disservices' (Pascual, Balvanera, Díaz, Pataki, & O'Farrell, 2017).

The ecosystem services' importance consists in their capacity to generate significant values in the local economy. Also, they have a substantial multiplier effect on the national economy. Many ecosystem services are unaware, therefore the attribution of economic effects is lacking. On another level, of the protected areas, they reflect the insufficiency of public investments and sustainable management that would increase the added value in the economy. The status of ecosystems influences human well-being and the management of protected areas influences the state of ecosystems.

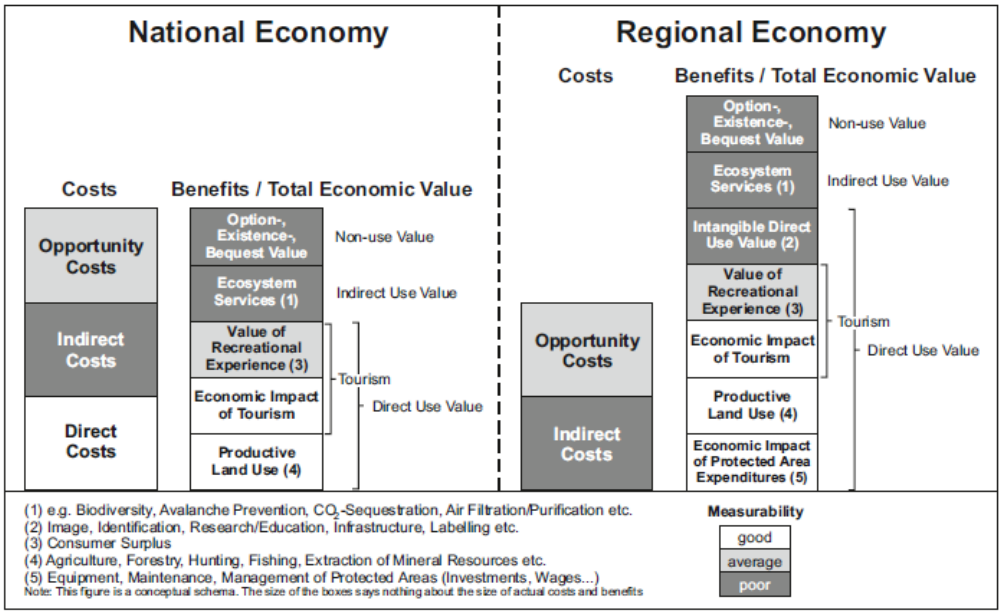

Figure 3. Costs and benefits of protected areas on the national and regional economic level
(Mayer & Job, 2014, p.76)

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In the current socio-economic context, the way to approach protected natural areas should not be limited to *protecting - preserving*, but a pragmatic, integrated vision that overrides the traditional concept, meaning *we protect for our benefit* (Frînculeasa & Chiţescu, 2018). Thus, the process of economic assessment of ecosystems has emerged as a natural consequence, and the influence of ecosystem-generated services on human well-being demonstrates the usefulness of identifying and capitalizing on them. A Millennium Ecosystem Assessment (MEA, 2005) report states that society depends on ecosystem services, although it behaves as if it was independent, as over 60% of these services are either diminished or unsustainable.

Protected natural areas ensure evolution and enable the adaptation of natural systems by preserving environmental conditions to certain parameters supported by legal regulations and financial interventions. Depending on the complexity of the systems, the quantity/quality of services provided and beneficiaries have a different impact on different levels.

The Convention on Biological Diversity (CBD), through the Aichi Biodiversity Goals, aims to protect 17% of terrestrial biomes and 10% of coastal and marine areas by 2020. The large number, the variety of protected areas and insufficient qualified staff imply, in addition to the current mode of administration, support management based on the expertise and knowledge, realized in collaboration with the managers of the protected areas and through the involvement of the local communities (Hockings et al., 2005). Based on these considerations, protected natural areas are the result of some social processes and political interventions in which sustainability and efficiency depend on institutional arrangements and power relations (Brechin, Wilshusen, Fortwangler, & West, 2002).

Involving social and political actors in nature management highlights the role it plays in providing the necessary services for human well-being. The multidimensional perspectives of the concept of well-being lead to the establishment of numerous interconnections between social and ecological. These can generate results that benefit some or all of the elements involved.

The management of protected areas always implies a higher level of control over natural resources. It is a way in which biodiversity, ecosystems, and habitats are better protected. This leads to an increase of the regulation flow and support of ecosystem services for people (Chan, Shaw, Cameron, Underwood, & Daily, 2006), but not always for the benefit of human welfare - loss of access to supply services (for example, forest resources), the associated cultural significance of these livelihoods or even cultural exclusion of people from landscapes with historical and symbolic significance (Lele, Wilshusen, Brockington, Seidler, & Bawa, 2010; Matsuura, 2017). On the other hand, it can ensure and facilitate access to ecosystem services important for well-being (Clements, Suon, Wilkie, & Milner-Gulland, 2014), contributing positively to poverty reduction (Andam, Ferraro, Sims, Healyd, & Hollande, 2010; Pullin et al., 2013; Robalino & Villalobos, 2015; Oldekop, Holmes, Harris, & Evans, 2016).

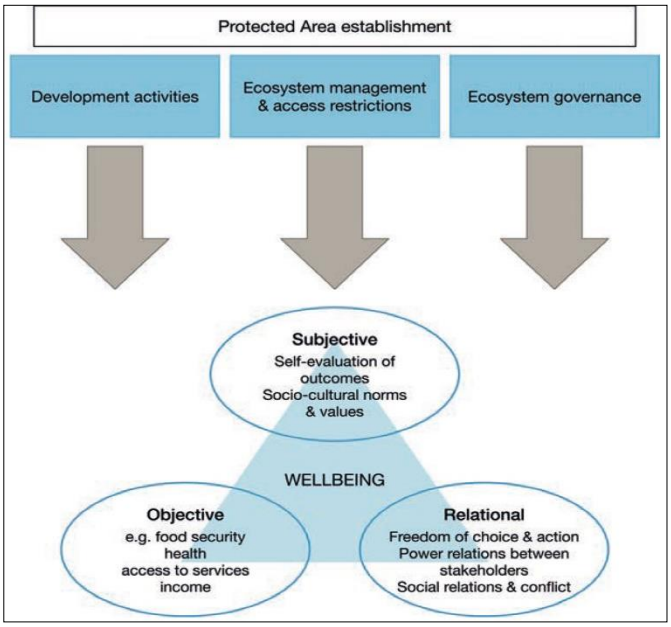

Figure 4. Conceptual framework showing the processes by which protected areas impact on the three dimensions of human wellbeing
(Woodhouse, Bedelian, Dawson, & Barnes, 2018, p.225)

Research methodology

Research are

Romania has a high experience in the protection of the environment. Under the Romanian legislation, the protected natural area is *"the terrestrial or aquatic area with a legal perimeter established and having a special regime for protection and preservation"* (Romanian Government, 2007). Currently, natural areas occupy about 23% of the country's territory. They are grouped into several categories in compliance with the priority conservation objectives and how they are managed. There were 28 major natural protected areas in terms of surface area, namely 13 National Parks and 15 Natural Parks, and Natura 2000 sites-protected natural areas of European interest.

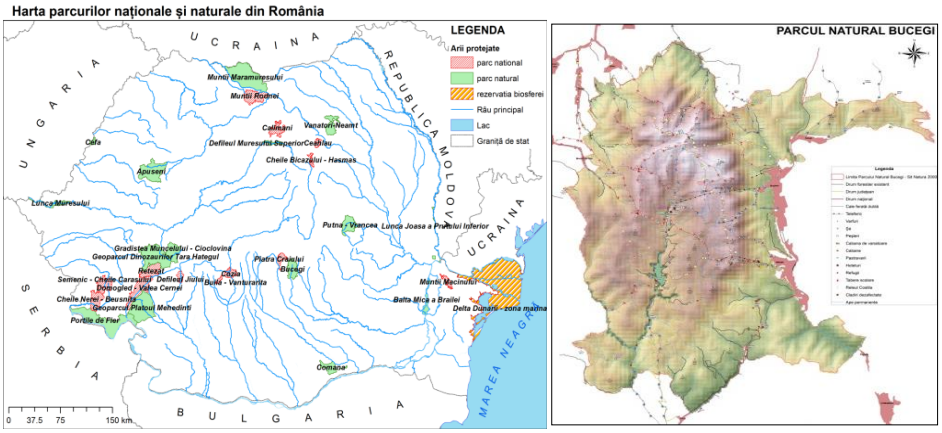

Figure 5.a. Map of national and natural parks in Romania; b. Map of B.N.P.
(Bucegipark.ro, 2018)

B.N.P. is located in the eastern part of the Southern Carpathians and covers an area of 32662 ha. The park is part of Romania's protected area network, according to Law 5/2000. Within its' perimeter, the Natura 2000 site (ROSCI0013) was declared by O.M 1964/2007, and 14 Natural Reserves are included (35% of the protected area). Due to the diversity of

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the morphological forms, the result of the geological processes and the phenomena induced by the external modeling agents, 46 monuments of nature were defined, especially the shapes of the karst relief, specific erosion differentiated, hydrological and morpho-hydrographic elements.

Research methodology

The economic assessment of biodiversity and ecosystem services is a challenge due to its analyzed system which is characterized by a multitude of factors that vary over time. The results of interdependencies between humans and nature are partly captured, interfering with personal filtering in the appreciation of the benefits. The intrinsic value of biodiversity and ecosystem services is difficult to assess, and obvious local or regional particularities. Therefore, a unitary methodology allowing the integration of all physical parameters into a value equation with comparable regional results is not yet used (Maes, Teller, & Erhard, 2013) inducing *"inconsistency in the methods used to quantify ecosystem services with consequences on the robust assessment of ecosystem services and their inclusion in national statistical systems and in the decision-making process."* (Crossman et al., 2013, p.8)

The topic of the theme has led to the elaboration of many studies based on the evaluation of ecosystem services. These can be found either as reports of local or regional/European institutional bodies, either as articles of specialty.

The ecosystem assessment (ES) methodology has the highest impact on the environment (Liu, Costanza, Farber, & Troy, 2010). The evaluation involves three stages:

1. Identification and analysis of ecosystem services based on the *"Cascade Pattern"* proposed by Potschin and Haines-Young (2011). It integrates social actors' perceptions about the ability of ecosystems to deliver various goods and services.
2. The hierarchy of the importance of ecosystem services has been achieved through its sociological method to establish a hierarchy of these services at the local and regional level.
3. Monetary evaluation of these services.

Value is associated with goods or services in a socio-economic characteristic context of a well-defined time period. The values of protected areas are considered to be the resources in the protected area that can be used to provide a benefit. In this context, the values represent potential benefits. Monetary value was the main dimension in establishing the value of ecosystem services (Costanza et al., 1997; Heal et al., 2005; Kumar, 2010), but the multidimensionality of the assessment cannot be limited to this value (Potschin & Haines-Young, 2016). To introduce these values into the economic system, a high number of evaluation methodologies and tools have been developed to quantify the services, benefits, and costs generated by them (Grigorescu, Lincaru, Pîrciog, & Chițescu, 2019). In the context of the principles of sustainable development, the tools allow the use of integrated indicators to express the direct connection between economic activities and the environment. The evaluation represents "*the act of assessing, appraising or measuring value, as value attribution, or as framing valuation (how and what to value, who values)*" (Dendoncker, Keene, Jacobs & Gómez-Baggethun, 2013, p.7). The valuation methodologies have taken into consideration several types of values such as ecological, socio-cultural and monetary values (Gómez-Baggethun & Martín-López, 2015), intrinsic values (non-anthropocentric values), instrumental values and relational values.

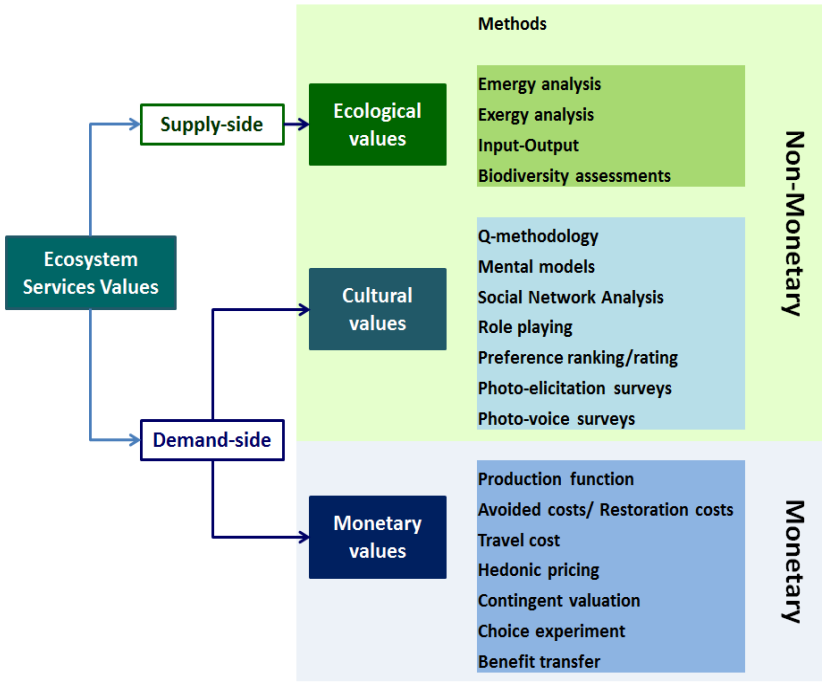

Figure 6. Non-monetary and monetary valuation methods and the value-pluralism
(Gómez-Baggethun & Martín-López, 2015, p.14)

Frequently, the sum of the ecosystem services' value in a protected area contains two major components: the value of use and non-use value (Ceroni, 2007). These are:

1. Values of use

– *Directly usable* values are directly accessible and can be consumed (e.g. goods used or processed directly, such as hay, wood, medicinal plants, forest fruits) and non-consumption (e.g. recreational, cultural values).
– *Indirectly useable values* represented by the role and natural function of the ecosystem (e.g. regulation of watercourses, soil protection, atmospheric carbon dioxide fixing). They are included in the category of regulation and control services. They are essential to society.
– *Optional and quasi-optional values* are attributed by a user, from a perspective of neutrality or aversion to the elements deriving from the ability of protected areas to preserve (by conservation) or generate, in the future, satisfaction regarding an ecosystem service.

2. Non-use values

– *Existential values* have the role of life support
– *Intrinsic values* refer to the mere existence of values that create satisfaction and whose preservation can be considered necessary for ethical or moral reasons.

Table 1. Values categories and valuation methods used

Values		**Methods of determining the value**
Value of use	-direct	1.Cost of travel 2. Virtual markets 3. Hedonic prices 4. Conditioned evaluation
	-indirect	1. Ecosystems' productivity modification 2. Avoided costs 3.Cost of travel

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Values		Methods of determining the value
		4. Cost of replacement 5.Conditioned evaluation
	-optional	1. Conditioned evaluation 2. Comparative evaluation 3. Individual selection methods
Value of non-use	-existential	1. Conditioned evaluation
	-intrinsic	1. Conditioned evaluation

Source: Barbier et al., 2009

The methodological approach of the social impact of the protected areas is different because the multidimensionality of the concept of welfare demands it (Coad et al. 2015; Ferraro & Pressey, 2015; Fox et al., 2014; Hicks et al., 2016; Hockings et al., 2005; Weeratunge et al., 2014). The evaluation of the relationship between protected areas/ biodiversity and social/ human well-being is mainly done by using the social/ global indicators used in the Protected Area Management Effectiveness (PAME) methods and stored in the Global Protected Area Management Effectiveness database (GDPAME). GDPAME is a global database containing information extracted from evaluations of protected areas carried out either by government agencies, NGOs, or financing institutions to make their management more efficient, especially in terms of policy involvement for biodiversity and human welfare.

This research direction is followed by numerous current studies, notably Corrigan, Robinson, Burgess, Kingston, and Hockings (2018) in which about 3000 GDPAME indicators were analyzed from 38 methodologies applied in over 180 countries to identify the main social indicators used to represent the dimension of human well-being, to establish the direction of their impact, positive or negative, and their level of neutrality (Corrigan et al., 2018). Thus, in the view of these authors, the development and use of a wider set of indicators is necessary and required in the current socio-economic and political context. The improvement of the research methodologies to obtain a real image of the effects of conservation on the local populations, of their well-being through the use of the ecosystem services, is also supported by Lange et al. (2016), who analyzed 95 studies that debate this problem and ascertains that, after the year 2000, the research approaches have undergone few changes, even though the dynamics between the two systems is accelerated.

Results and discussions

The assessment of ecosystems defining a protected natural area is a laborious process (meetings with the involved social actors, debates) and involves economic and mathematical modeling for each ecosystem. It involves the statistical and economic analysis of environmental indicators. To obtain these, the National Accounts System (INSS database) was used where several modules were included. The modules concerned atmospheric emissions, environmental taxes and material flows (2011), physical energy flow, environmental goods and services, and environmental protection expenditure (2013). The data can only be converted into quantifiable information at a national level, but for many local studies (partly the area under consideration), quantitative research is limited due to the lack of updated, thus relevant, socio-economic data from the temporal series of the institution's statistics. In Romania, the total/partial value of ecosystem services was calculated for several protected areas: Maramures Mountains Natural Park (Ceroni, 2007) with a value/year of 152.756RON/ 298.008 RON depending on CO2 sequestration-lower/upper bound (Popa et al., 2013), Cozia National Park, Domogled

National Park, Piatra Craiului National Park, Iron Gates National Park (Dumitraş, Arion, & Merce, 2011; Dumitraş & Dragoi 2007), Piatra Craiului Mountains (Popa et al., 2013).

Bucegi Natural Park supports, through protection, the terrestrial biodiversity. It hosts significant ecosystems that are concentrated in the mountain, subalpine and alpine areas. Mountain ecosystems provide vital services, such as forest products, food, and services related to recreation and tourism (Gret-Regamey, Brunner, & Kienast, 2012). In the analyzed are the forests occupy approximately 60% of the protected area. Forest ecosystems are a) forest ecosystems mainly represented by beech forests, mixed forests: beech, fir, and spruce; fir and spruce woods; spruce forests; on a small area, Silvestre pine forests and larch forests; ribbon corridors of white and black alder; b) mountain pasture ecosystems, used as meadows or pastures; c) Subalpine grassland ecosystems, some of which are used as pastures; d) Subalpine ecosystems formed mainly by associations characterized by the dominance of juniper, smolder, juniper, cranberry or cranberry; e) ecosystems of rocks and grooves; f) aquatic ecosystems-rivers, streams, ponds.

Regarding these considerations, the study stopped to present the evaluation of the services provided by the forest ecosystem. It plays an important socio-economic role for local communities. 11078.1ha (52% of total forest area) is certified wood (as it was initiated in 1993 by the Forest Stewardship Council-FSC). This certification of forest management ensures better conservation and capitalization which can be translated as an improving way of forest's works, reducing illegal cuts and marketing to Western Europe. However, the research on these types of services, through maximization processes, can lead to unsustainable management of other services generated by the same ecosystem. Poor management can reduce their use-value leading to conflicts between stakeholders who may perceive the benefits offered by ecosystems differently (Castro et al., 2011; Fisher et al., 2008).

Applying the methodology, the main services/functions granted by the forest ecosystem have been identified: carbon sequestration, erosion control, habitat establishment and provision of seclusion areas, ensuring timber and non-timber resources, facilitating hunting activities, securing water reserves, preserving artistic cultural values, Recreation. Their hierarchy, as well as their monetary value, has not been calculated, and they are subject to further study.

Carbon sequestration denotes the amount of carbon found in the wood mass where it has been accumulated through increases and is not subsequently reintroduced into the carbon circuit. Carbon sequestered wood is the result of the difference between the current increase and the harvested opportunity. Romania has not yet regulated the carbon sales mechanism, leading to a not so well defined service of the carbon storage. The calculation formula for the carbon content within the estimated wood volume represents 50% of the total as follows:

$$Vc = Cc - Pa,\ CO2 = 50\%Vc$$

Where Vc – the cumulated wood volume, Cc – the current increase, Pa – the annual opportunity

The total forest fund, privately and state-managed, in B.N.P. is 27,280.95ha. Since the forest fund is shared among several owners, centralized information on current increases for each area is not available. Thus, the average national dull increase of 5.6m^3/year/ha was adopted, and the harvested option is the average national estimate of 2.67m3/year/ha.

Ensuring water resource. This service represents an accumulation of sub-services such as:

a. *Drinking water reserve*. Several karst hydro structures are highlighted, but their hydrodynamic complexity is a problem in operation. Several water abstractions provide the needs of adjacent (e.g. the Rătei Source). Mineral water is also exploited inside the

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park. Users capture sources by the natural spill, thus taking only the surplus water released by the deposit. The value is calculated in terms of the amount captured per unit of time.

b. *Water needs for irrigation*. As a mountain area where two main river basins are found, this value is not calculated.

c. *Hydropower generation*. Within the B.N.P. there are CHE Scropoasa, CHE Dobreşti, and CHE Gâlma-Moroieni.

d. *Water needs for industry*. The need for water in the industry is provided by supplementing the natural contribution of the Ialomita River, by the three accumulation lakes: Bolboci, Scropoasa, and Dobreşti.

e. *Water needs for fisheries (trout)*. The natural park has more fishing funds. Fishing Fund Ialomiţa, Brătei, Bolboci, Scropoasa. There are some private trout capturing water from the Natural Park (some inside the natural area, others in the surrounding areas).

f. Recreational role. The waters with the recreational role are the lakes (Scropoasa, Bolboci) and the waterfalls. They are well-valued by tourist facilities.

The value of this service is calculated by summing the values obtained for each subsystem, the dominant one being the result of water capture for communities and energy generation.

Providing timber and non-timber resources. Forest fruits and mushrooms are included in the category of non-timber resources. These are harvested and valued in compliance with the legislation. Wood products are not harvested for commercial purposes.

Set up habitats and ensure quiet areas. The diversity of habitats, 24 in number, is ensured by the protection of biological diversity by strictly integrated forests or those that maintain the conditions for the development of a variety of flora and fauna species with relict species and endemic.

Facilitate hunting activities. The forest ecosystem, in its complexity, allows the development of a hunting fund on an area of 27317ha, within the quota limits set by hunting fund law. The animals that can be hunted are deer, boars, and birds. The economic value is calculated by summing the national harvesting prices and recreational costs.

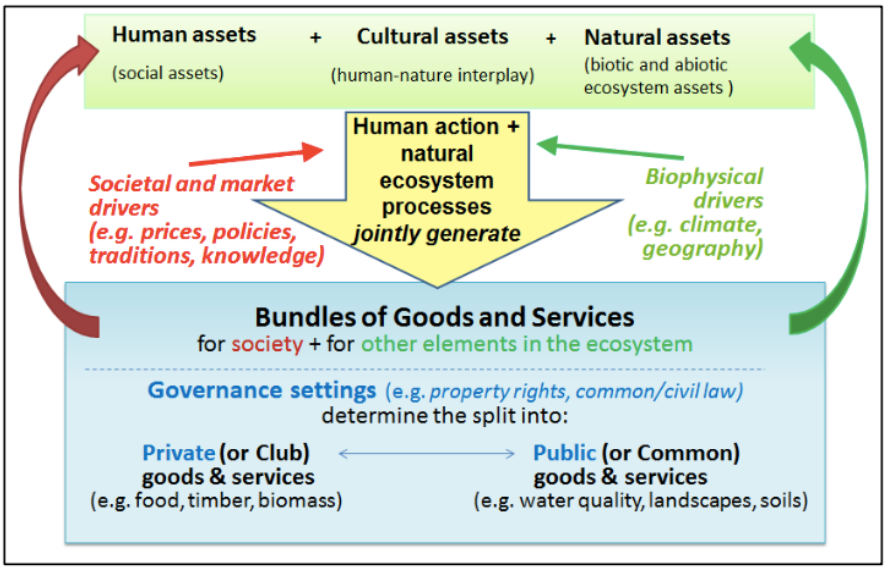

Figure 5. Ways of efficient management and exploitation of the forest ecosystem The Ecological System
(PEGASUS, 2015)

Under the Romanian legislation, the main beneficiaries of forestry services are (Drăgoi & Cirmu, 2016, p.98):

a. The National Forestry Board whose funds can be made up of the *"equivalent value of forest ecosystem services provided by maintaining forest protection functions, which are borne by the direct or indirect beneficiaries of forest ecosystem services, which are transferred to the fund for the improvement of the fund land-based forestry"*(Forest code Art.11, lit. e)*;*
b. Private owners *"imposing restrictions ... through forest landscaping, regulation of national parks, natural reserves, biosphere reserves, and Natura 2000 sites or other rules, including those establishing different types of functional groups, can be made either with the consent of the owner or with the payment of fair and preliminary compensation, paid annually, fully offsetting the unrealized income of the forest owner, a natural or legal person"* (National Rural Development Program, 2014) Estimation according to WWF (2016) methodology at a national level is around 40 million euros per year from the national budget.

The forest ecosystem ensures, through the correct management, the increase of the living standards of the neighboring communities, but the people have different abilities in benefiting from the ecosystem services. In poverty prevention, forest products tend to play the role of safety nets (Angelsen & Wunder, 2003; Mayers, 2007). In the case of PNB, the forest ecosystem and the services they generate are extremely important for the households in the village of Glod, Moroieni commune, because, traditionally, the activities in which they are involved are limited to forestry activities such as handicraft sales (for example, braids, spoons), berries and chickpeas, building stone. Even if the links between access to energy and human well-being are documented through studies (e.g., Narayan, Chambers, Shah, & Petesh, 2000; UNDP, 2005; Wilkins, 2002) the use of wood as a means of heating/fuel consumes time for harvesting, technical means of harvesting, cutting and transport, and, in the analyzed case, it is done at the limit of legality. Although some of the forests in the GNP are private, land privatization is not a massive institutional change, with important socio-cultural and environmental effects.

Government and local policies promote the diversification of sources of income, and ecotourism is the main asset of GNP. Burkhard, Petrosillo, and Costanza (2010) attributed to each landscape unit value for providing a variety of ecosystem services. Even if such an approach takes into account mainly the morphological and biophysical factors of the area (topography, geology, soil, hydrology, fauna, and flora), the use of land, distances from cities, population density, in the case analyzed, the exploitation of the aesthetic role of the landscape generated by the forest ecosystem is a defining element. Thus, tourism is well developed in the area of the park, benefiting from a large number of visitors annually. It is an extremely important component as a value, both material and non-material, being the most efficient way of preserving and exploiting local cultural identities, that is to say, traditional products and their production processes.

The tourism activities in the protected areas have both positive and negative impacts on several components of the well-being of the communities with which they interact. Changing tourists' preferences involves modifying the services provided, which can lead to changes in the attributions of the value of using the forest ecosystem, and the perception of the landscape is part of the cultural identity of the communities bordering the park (for example, the ability to maintain the traditional practices and the social interactions connected through access to medicinal plants or subsistence exploitation Martin et al., 2016). Their self-regulation capacity is limited, leading to changes in the provision of ecosystem services. Even though wealth sharing in tourism can increase wealth, focusing on its material impact is an insufficient way to analyze the relational and environmental dimensions of well-being because supporting the relational and subjective dimensions of well-being is essential for improving local legitimacy (Schreckenberg, Franks, Martin, & Lang, 2016).

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The static nature of conventional protected areas can be particularly problematic for mobile groups, such as pastors who rely on the temporal and spatial use of dynamic resources (Reid, Fernández-Giménez, & Galvin, 2014, p.21). On the other hand, the analysis of this aspect in GNP does not lead to similar conclusions. The existence of stands, sheep, and cattle, in relatively large numbers, support the local tradition, the well-being of some of this professional category and attract more and more tourists.

Romania, through its many protected areas, has significant potential in terms of the productive capacity of forest ecosystems. Under-funding threatens the exploitation of long-term ecosystem services. The economic analyses of the need for funds for the management of the protected natural areas have estimated the costs necessary to apply a basic management minimum of 8 euros/hectare and the optimal one at 12 euros/hectare (WWF, 2016).

The administrations of protected areas are those who provide financing from assessment, conservation and protection activities (from their revenues or attracted by projects). For example, F*unding of B.N.P. activities are provided by funds from:* a) *annual allocation from the Romsilva; b) structural funds through the implementation of projects with various sources of funding; c) taxes, fees set for visiting or for the facilities, services and specific activities carried out in the Park, sponsorships, income from collaborative contracts* (The Ministry of the Environment and Climate Change, 2018).

The importance of paying ecosystem services as an element that ensures the balance between preservation and pressures is crucial, but this is not fully realized (e.g. negotiation with the Tourism Authority, tour operators or travel organizations as a percentage, 1% of profit to return to natural areas). *The implementation of a payment system does not solve the problem of providing long-term protection services but only places it in the mercantile paradigm* (Grigorescu, 2005; Kosoy & Corbera, 2010, p.1230), but effective management can harness ecosystem services as a successful alternative in local or regional economic development.

The local population does not perceive the degradation phenomenon, so it does not realize the costs associated with it, so also the economic consequences. Thus, the managing authorities of the protected areas, the representatives of the local communities and all the stakeholders must communicate effectively and constructively for the adaptive management of the problems that derive from the interdependencies of the ecological environment with the social one, for the benefit of both parties. Awareness and recognition of the interdependencies between all the actors involved can be achieved through participatory modeling, ecological solidarity, which allows interested parties to collaborate to build a sustainable socio-ecological culture (Mathevet, Thompson, Folke, & Chapin, 2016).

The main challenges that should be addressed are:

- the forests cutting down on large surfaces, improper exploitation, that could create disequilibrium (ex. landslides). This is controlled by the forest regime and the penalties applied, forest radar, forest police;
- the invasion of the tourists and their aggressive and polluting behavior. Restriction of the vehicles, fewer access roads, barriers, forest police are some of the action that can be used to protect the areas;
- the willingness of the owners (especially private) to benefit from the opportunity to build facilities, to develop capacities (bottling water plants) can be regulated by law.

All the challenges can be managed by education and knowledge about the role, importance and value of the protected natural areas and the way to add value without destroying the wildness and the beautifulness.

Conclusions

The natural areas remain the guarantor of the ecosystems biodiversity's protection. They ensure the support of people's lives and well-being. They generate direct benefits (e.g. tourist and recreational activities), as well as ecosystem goods and services (e.g. flood control, water pollution, pollination and recycling of nutrients), underlining their economic role. Starting from the analyzed case, to fully benefit from the multiple advantages of ecosystem services, at the level of all protected areas, it is recommended:

1. *general*

- integrating the ecosystem approach in the public policies developed in the paradigm of the green economy of the environment-halting the loss of biodiversity and degradation of the ecosystem services;
- standardization of the methods of ecosystem assessment, meaning the adoption by Romania of some evaluation elements-the implementation of the MAES at a national level;
- a better understanding of the interactions that are established between the relations of power, justice and ecosystem administration;
- the role of ecosystem services in providing and sustaining benefits for people and how these benefits and values are perceived by the public and decision-makers;
- development of communication channels accessible to the widest audience (accessible language, efficient, functional sources)
- re-conceptualizing the place of people in nature, overcoming the paradigms of conservation through isolation;

2. *particular* for the B.N.P. (as constituent elements of adaptive management, flexible and based on the reality within the limits of the capacity of the functioning of the local and adjacent ecosystems)

- protection of the surface of the forest ecosystems with potential for physical use of the landscape, of the animals and the wild plants and their products, of the climate;
- assurance of the hydrological flows by maintaining the average level of evapotranspiration and ensuring the potential for feeding the water through infiltration;
- development of tourism based on nature (B.N.P. has a rich natural potential), especially the one associated with forests and the characteristics generated by them-accessibility, services;
- extending the administration to the social-ecological interactions established with the neighboring communities;
- the distribution model of the incomes, implicitly the increase of the welfare within the different local social groups;
- employment-increasing the number of employees in the forestry sector and educating the human resource-training of specialists in specific issues of the protected areas (geologist, biologist, zoologist, construction engineers, cartographers, lawyers, economists), raising the awareness of the beneficiary of the services green;
- the GNP framework provides analytical space for understanding the contribution of ecosystem services to welfare payments;
- development of efficient tools, adapted to the specific area of the protected area, for the payment of ecosystem services.

The limitations of the economic evaluation of ecosystem services: lack of data (e.g. statistics on tourism activities specifically associated with forests and their characteristics) to develop the indicators for recreational values (natural, cultural tourism) or rights of use and resolution of available data, price variability AUs/EUAs leading to the uncertainty related to the calculation of the economic value of CO2 emissions compensation, the absence of a time series on the age structure of forests of Romania with national coverage, time.

The practical perspective of our finding is the brother's view of the natural areas and their importance for the human-nature ecosystem. It could be used by the public policies and decision-makers to promote and valuate the economic benefits without spoil the wildness or destroy the equilibrium.

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The effective economic contribution of ecosystem services is difficult to determine even if it is certain. The image capital brought to the regional local identity is an added value. The perspectives of increasing the economic value of the ecosystems in protected natural areas (including the B.N.P.) are ensured by raising awareness of their importance and sustainable use through the adoption of management strategies based on efficient tools, knowledge, and respect for the environment. The financial values depend on the context and the purpose of ecosystem services' evaluation. In the current socio-economic context, the circumstances in which welfare derives exclusively from ecosystem services are rare and punctual. Their social importance is fully recognized, but access to food, education, healthcare, energy, and technologies is a wish of all societies. At the same time, the subjective dimensions of well-being must be looked at and emphasized much more because living well in a local context, in accordance with personal values, preferences, and perceptions, are elements of a sustainable socio-economic framework.

Better knowing the integrated value of ecosystems in protected natural areas we can take advantage and use what they are offering, and keep them as they are for a long time. We only need to learn how, how much, whereby to exploit or protect to keep the equilibrium.

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